NORTH CAROLINA MARINE FISHERIES COMMISSION

November 2026

Business Meeting Briefing Materials

November 18, 2026

Wrightsville Beach, N.C.

NC Marine Fisheries Commission

Table of Contents

November 2026 Quarterly Business Meeting

Contents

Preliminary Matters (Agenda)

Chairman's Report

Committee Reports

Director's Report

Fishery Management Plans

Coastal Habitat Protection Plan

Rulemaking

Preliminary Matters

November 2026 Quarterly Business Meeting

Documents

Meeting Agenda

Draft August 2026 Meeting Minutes

Marine Fisheries Commission Business Meeting
AGENDA

Holiday Inn Resort Lumina; Wrightsville Beach, NC
November 18, 2026

N.C.G.S. 138A-15(e) mandates at the beginning of any meeting of a board, the chair shall remind all members of their duty to avoid conflicts of interest under Chapter 138. The chair also shall inquire as to whether there is any known conflict of interest with respect to any matters coming before the board at that time.

N.C.G.S. 143B-289.54.(g)(2) states a member of the Marine Fisheries Commission shall not vote on any issue before the Commission that would have a "significant and predictable effect" on the member's financial interest. For purposes of this subdivision, "significant and predictable effect" means there is or may be a close causal link between the decision of the Commission and an expected disproportionate financial benefit to the member that is shared only by a minority of persons within the same industry sector or gear group. A member of the Commission shall also abstain from voting on any petition submitted by an advocacy group of which the member is an officer or sits as a member of the advocacy group's board of directors. A member of the Commission shall not use the member's official position as a member of the Commission to secure any special privilege or exemption of substantial value for any person. No member of the Commission shall, by the member's conduct, create an appearance that any person could improperly influence the member in the performance of the member's official duties.

Commissioners having questions about a conflict of interest or appearance of conflict should consult with counsel to the Marine Fisheries Commission or the secretary's ethics liaison. Upon discovering a conflict, the commissioner should inform the chair of the commission in accordance with N.C.G.S. 138A-15(e).

Wednesday, November 18, 2026

9:00 a.m. Public Comment Period

10:30 a.m. Preliminary Matters
- Commission Call to Order* – *Sammy Corbett, Chairman*
- Moment of Silence and Pledge of Allegiance
- Conflict of Interest Reminder
- Roll Call
- **Approval of Meeting Minutes ****

10:45 a.m. Chairman's Report
- Letters and Online Comments
- Ethics Training and Statement of Economic Interest Reminder
- 2027 Meeting Schedule

11:00 a.m. Committee Reports
- MFC Nominating Committee – *Chris Batsavage*
  - **Vote on slate of nominees for the at-large seat for the South Atlantic Fishery Management Council ****
  - **Vote on slate of nominees for the at-large seat for the Mid-Atlantic Fishery Management Council ****

11:30 a.m. Director's Report – *Jonathan Howell*
- Rule Suspensions – *Jason Rock*

12:30 p.m. Lunch

**** Times indicated are merely for guidance. The commission will proceed through the agenda until completed.***
*****Probable Action Items***

1:30 p.m. Coastal Habitat Protection Plan 2026 Amendment – *Charlie Deaton*

- **Vote to send draft plan out for public and advisory committee review ****

2:00 p.m. Results of the Kingfishes FMP Scoping Period – *Matthew Doster, Dan Zapf*

- **Vote on approval of Goal and Objectives for Kingfishes FMP Amendment 1 ****

2:30 p.m. Rulemaking – *Catherine Blum*

- 2026-2027 Rulemaking Cycle
  - **Receive public comments and vote on final approval to adopt 15A NCAC 03M .0524 for Atlantic Bonito Management ****

3:00 p.m. Issues from Commissioners

3:30 p.m. Meeting Assignments and Preview of Agenda Items for Next Meeting – *TBD, MFC Coordinator*

3:45 p.m. Adjourn

**** Times indicated are merely for guidance. The commission will proceed through the agenda until completed.***
*****Probable Action Items***

Marine Fisheries Commission Business Meeting Minutes

DRAFT

DoubleTree Midtown

Raleigh, North Carolina

August 19-20, 2026

The Marine Fisheries Commission (MFC) held a business meeting August 19-20, 2026, at the DoubleTree Midtown in Raleigh, North Carolina. In addition to the public comment sessions, members of the public submitted public comment online or via U.S. mail. The written comments, briefing materials, presentations, and full audio from this meeting are available here.

Actions and motions from the business meeting are listed in **bold** type.

BUSINESS MEETING

August 19, 2026

Preliminary Matters

Chairman Corbett called the August 2026 business meeting to order.

Chairman Corbett began the meeting with a moment of silence, followed by the pledge of allegiance.

Next, Chairman Corbett reminded all commissioners of N.C. General Statute § 138A-15(e), which mandates at the beginning of any meeting of a board, the Chair shall remind all members of their duty to avoid conflicts of interest under Chapter 138. The Chair also shall inquire as to whether there is any known conflict of interest with respect to any matters coming before the board at that time. There were no stated conflicts of interest from any commissioner.

The following MFC members were in attendance: Mike Blanton, Willie Closs, Sarah Gardner, Alfred Hobgood, John Mallette, Doug Rader, Tom Roller, William Service, and Sammy Corbett – Chairman.

Chairman Corbett asked for any corrections, additions or deletions that need to be made to the May 2026 MFC Quarterly Business Meeting minutes.

Motion by Commissioner Roller to approve the May 2026 business meeting minutes.

Second by Commissioner Rader.

Motion passed unanimously.

View the video recording of the motion and surrounding discussion

Chairman's Report

Letters and Online Comments

Chairman Corbett referred commissioners to letters and comments provided in the briefing materials.

Ethics Training and Statement of Economic Interest Reminder

Chairman Corbett reminded commissioners to work with MFC Liaison Jesse Bissette to stay up to date on their ethics training and Statement of Economic Interest.

Election of Vice Chair

Chairman Corbett asked for nominations for the Marine Fisheries Commission Vice Chair.

Commissioner Blanton nominates Commissioner Gardner for Marine Fisheries Commission Vice Chair.

Second by Commissioner Mallette.

Motion passed unanimously.

Commissioner Gardner elected as Marine Fisheries Commission Vice Chair.

View the video recording of the Chairman's Report and surrounding discussion

Red Snapper EFP Update

Interim Director Michael Loeffler introduced himself to the Commission and then turned the floor over to DMF Assistant to the South Atlantic Fishery Management Council (SAMFC) Trish Murphey for an update on the Red Snapper Exempted Fishing Permit (EFP)

Murphey provided an update on the status of North Carolina's EFP application. Following the Commission's May meeting, when the Commission was informed that North Carolina had been awarded an EFP, a lawsuit resulted in an injunction preventing implementation of the permit. North Carolina subsequently requested that its EFP be withdrawn, which NOAA approved.

Georgia, Florida, and South Carolina resubmitted EFP applications addressing the court's concerns and including proposed harvest limits. North Carolina elected not to resubmit an application for the 2026 season and instead plans to focus on a potential EFP for the 2027

season. North Carolina does not currently hold an EFP for the 2026 season. NOAA anticipates that the federal recreational red snapper season will likely occur in October.

Chairman Corbett opened the floor for questions and comments regarding the Red Snapper EFP.

View the video recording of the verbal presentation and surrounding discussion

Director's Report

Interim Director Michael Loeffler provided several Division updates. He announced Barbie Byrd as Deputy Director of Science and Management. The additional deputy director position will allow for greater focus on the Division's science and management responsibilities.

Loeffler provided an update on the recent contested case hearing regarding a denied shellfish water column lease. Shellfish leasing staff anticipate receiving a ruling later this fall. He also notes that the Division has received the judge's ruling related to the ongoing CCA lawsuit and is currently reviewing the decision. As the litigation remains ongoing, the Division will not make further statements at this time.

The shellfish lease moratorium in Bogue Sound expired July 1, allowing new shellfish lease applications in the area between the Morehead City Port and Emerald Isle bridge. The Division has received six applications sine the moratorium expired.

Loeffler provided budget and legislative updates, noting the General Assembly approved a 3% salary increase for state employees, with an additional increase for law enforcement. A one-time bonus of either $1,700 or $1,000 was also approved, depending on employee salary. Additionally, the budget includes funding for nine new Marine Patrol Officer positions.

Loeffler recognized the Division's IT staff for their work incorporating artificial intelligence (AI) into the Division's biological database. The project has utilized AI to modernize the biological database and reduce manual data entry resulting in an estimated $300,000 in state savings and years of reduced manual work. The team received the 2026 AI 50 State Project Award and the 2026 Governor's Award for Excellence in Efficiency and Innovation. Loeffler recognized the team members involved in these efforts: Stephanie McInerny, Chris Capoccia, Becky Chapman, Semir Badic, and Scott Smith.

Lastly, Loeffler recognized several recently retired DMF employees and thanked them for their service and contributions to the Division, including former Director Kathy Rawls, Sergeant Brian Long, Pilot Mark Daniels, Officer Bill Register, Maintenance Supervisor Steve Chapman, and Environmental Technician Steve Trowell.

View the video recording of the Director's Report and surrounding discussion

Fishery Management Plan Updates

DMF Fishery Management Plan Coordinators Jeff Dobbs and Dan Zapf gave a presentation on the implementation of adopted FMPs and upcoming FMPs.

After the presentation, Chairman Corbett opened the floor to commissioners for comments and questions.

View the video recording of the presentation and surrounding discussion

Fishery Management Plan Annual Review

DMF Biologists Charlton Godwin and Jeff Dobbs gave a presentation on the FMP Annual Review.

After the presentation, Chairman Corbett opened the floor to commissioners for comments and questions.

View the video recording of the presentation and surrounding discussion

Review of Kingfishes Stock Complex Data

DMF Biologists Matt Doster, Claire Pelletier, and Matt Zink gave a presentation on the Kingfishes Stock Complex Data.

After the presentation, Chairman Corbett opened the floor to commissioners for comments and questions.

View the video recording of the presentation and surrounding discussion

Public Comment Period

Chairman Sammy Corbett held a public comment session that began at 6:00 p.m. The following members of the public provided comment to the commission: Mary Ellon Ballance, Bob Woodard, Marc Boettger. With no one else wishing to speak, Chairman Corbett ended the public comment period at 6:11p.m.

View the video recording of the August 19, 2026, 6:00 p.m. public comment session

August 20, 2025

Public Comment Period

Chairman Sammy Corbett held a public comment session that began at 9:00 a.m. The following members of the public provided comment to the commission: Stuart Creighton.

DRAFT

With no one else wishing to speak, Chairman Corbett ended the public comment period at 9:04 a.m.

View the video recording of the August 20,2026, 9:00 a.m. public comment session

DWR Water Quality & the Connection to Division of Marine Fisheries

DWR Deputy Directors Michael Pjetraj and Julie Grzyb and Water Planning Section Chief Karen Higgins gave a presentation on North Carolina's water quality management.

After the presentation, Chairman Corbett opened the floor to commissioners for comments and questions.

View the video recording of the presentation and surrounding discussion

Comments from DEQ Secretary

DEQ Secretary Reid Wilson provided comments to the Commission and updates on current Department initiatives. He thanked the Commissioners for their time, service, and contributions to the public, as well as DEQ staff for their continued work.

Wilson recognized Marine Patrol's response to Hurricane Helene, specifically their efforts to conduct swiftwater rescues and transportation and distribution of supplies to affected communities. He reported that Governor Stein recently announced approximately $1 billion in DEQ funding for Helene recovery. While the funds have been awarded, they have not yet been spent. Much of the funding is directed toward repairing and strengthening damaged water infrastructure, with additional funding dedicated to debris removal. Other recovery efforts have included inspections of more than 400 dams, mapping approximately 4,000 landslides, and funding 24 emergency microgrids to be installed in affected communities. Wilson notes that the state is approaching the two-year anniversary of the storm and recognized both the extent of the devastation and the continued efforts of affected communities to rebuild.

Wilson provided an update on statewide flood resilience initiatives. DEQ has developed flood resilience blueprints for six river basins, providing an online resource for local governments to identify areas most vulnerable to flooding and evaluate potential projects to reduce future impacts. Through the program, DEQ has awarded $44 million to 83 projects across the six river basins. Revised floodplain maps have also been published to reflect recent flooding conditions. Additionally, DEQ is developing action strategies for each river basin in collaboration with local communities. Strategies have been issued for the Neuse and Tar-Pamlico river basins, with the Lumber river basin strategy scheduled for release followed by the White Oak, Cape Fear, and French Broad river basins in the coming months. Wilson also highlighted the Resilient Coastal Communities Program, which works

with local governments to identify projects that address coastal flooding and improve community resilience. To date, the program has identified 89 projects totaling approximately $16 million.

Regarding PFAS, Secretary Wilson discussed a recently announced settlement involving the U.S. Environmental Protection Agency (EPA), the U.S. Department of Justice, and Chemours. The settlement affects Chemours facilities in North Carolina, New Jersy, and West Virginia. Wilson expressed concerns that North Carolina was not consulted during settlement negotiations and stated that the agreement provides little benefit to the state. He noted that the pollution reduction requirements included for New Jersey and West Virginia have largely already been addressed in North Carolina through a consent order established approximately seven years ago. The settlement sets aside $90 million over 15 years for projects, with approximately $2 million allocated annually to each state, although the funding is not guaranteed. Wilson stated that the settlement does not adequately address North Carolina's needs. Governor Stein, the Attorney General, and Secretary Wilson submitted joint comments to the EPA, DOJ, and the court urging rejection of the settlement.

Wilson discussed findings from the UNC Collaboratory regarding PFAS contamination at rural fire departments across the state. Testing identified elevated PFAS levels at numerous fire stations, potentially associated with firefighting equipment and contamination in surrounding communities. Additional testing was conducted at nearby residences. The Environmental Management Commission (EMC) has issued draft rules addressing PFAS and other chemicals through a Monitoring and Minimization Rule. The proposed rules would require monitoring of discharges into state waters and the development of plans to reduce those discharges but would not establish specific pollution reduction requirements. Wilson stated that DEQ supports pollution reductions at the source and noted that the EMC has received numerous public comments, with most encouraging the inclusion of measurable pollution reduction requirements.

The Secretary provided an update on DEQ's permitting transformation initiative, which is focused on improving the permitting process. Approximately 60% of the Department's permits have been updated as part of the effort.

Wilson reported that the recently approved state budget provides several additional resources and funding opportunities for DEQ. Key investments include additional positions and laboratory support for PFAS monitoring, water infrastructure improvements, and alternative water sources for households affected by contamination. The budget also includes funding for Hurricane Helene dam recovery projects, flood resilience initiatives, the Resilient Coastal Communities Program, coastal reserve management, and the

Albemarle-Pamlico National Estuary Partnership. Additional funding was allocated for air quality initiatives and DEQ's permitting transformation project. Marine Patrol will also receive funding for nine additional officer positions. Wilson characterized the budget as providing several positive investments and additional resources for the Department.

Wilson provided an update on the ongoing CCA lawsuit, noting that the judge ruled against the state. DEQ is reviewing the decision an consulting with the DOJ regarding next steps.

Secretary Wilson thanked Interim Director Michael Loeffler for stepping into the leadership role and reported that the process of interviewing candidates for the permanent DMF Director position is ongoing.

Wilson also discussed the UNC Collaboratory report, describing it as a fair and balanced assessment. He noted that elements of the report may be incorporated into the state's response to the court. The Coastal Habitat Protection Plan (CHPP) was identified in the report as a valuable tool that could benefit from stronger implementation measures. Wilson emphasized the importance of the CHPP in protecting healthy habitats and improving water quality.

Lastly, Wilson noted that DEQ is developing videos featuring employee interviews to highlight the work conducted across the Division of Marine Fisheries, including programs and responsibilities that may be less familiar to the public.

Chairman Corbett opened the floor to commissioners for comments and questions.

View the video recording the DEQ Secretary's comments and surrounding discussion

Coastal Habitat Protection Plan

DMF Biologists Charlie Deaton, Derek Detweiler, and Jaselyn Owens gave a presentation on the Coastal Habitat Protection Plan 2026 Amendment draft.

After the presentation, Chairman Corbett opened the floor to commissioners for comments and questions.

View the video recording of the presentation and surrounding discussion

Standard Commercial Fishing License Eligibility Report

Marine Patrol Captain Garland Yopp, the Standard Commercial Fishing License (SCFL) Eligibility Board Chair, gave a presentation with information about the SCFL eligibility pool determinations.

After the presentation, Chairman Corbett opened the floor to commissioners for comments and questions.

DRAFT

Motion by Commissioner Blanton to set the number of licenses in the Standard Commercial Fishing License Eligibility Pool for the 2026-2027 license year at 500.

Second by Commissioner Gardner.

ROLL CALL VOTE					
Member	**Aye**	**Nay**	**Abstain**	**Recuse**	**Absent**
Blanton	☒	☐	☐	☐	☐
Closs	☒	☐	☐	☐	☐
Gardner	☒	☐	☐	☐	☐
Hobgood	☒	☐	☐	☐	☐
Mallette	☒	☐	☐	☐	☐
Rader	☒	☐	☐	☐	☐
Roller	☒	☐	☐	☐	☐
Service	☒	☐	☐	☐	☐
Corbett	☒	☐	☐	☐	☐

Motion passed unanimously.

Commissioner Closs left the meeting.

View the video recording of the presentation and the surrounding discussion

Rule Suspensions

Fisheries Science Section Chief Jason Rock gave a verbal presentation providing information on current rule suspensions and requesting the MFC vote on approval of an additional suspension.

After the presentation, Chairman Corbett entertained a motion to address the additional rule suspension.

Motion by Commissioner Roller to suspend Section (h) of NCMFC Rule 15A NCAC 03J .0103 GILL NETS, SEINES, IDENTIFICATION, RESTRICTIONS for an indefinite period.

Second by Commissioner Rader.

ROLL CALL VOTE					
Member	**Aye**	**Nay**	**Abstain**	**Recuse**	**Absent**
Blanton	☒	☐	☐	☐	☐
Closs	☐	☐	☐	☐	☒
Gardner	☒	☐	☐	☐	☐
Hobgood	☒	☐	☐	☐	☐

DRAFT

Mallette	☒	☐	☐	☐	☐
Rader	☒	☐	☐	☐	☐
Roller	☒	☐	☐	☐	☐
Service	☒	☐	☐	☐	☐
Corbett	☒	☐	☐	☐	☐

Motion passed 8-0 (1 absent).

View the video recording of the presentation and surrounding discussion

Rulemaking

Division of Marine Fisheries (DMF) Rulemaking Coordinator Catherine Blum provided updates on the 2024-2025 rulemaking cycle, 2025-2026 rulemaking cycle, and 2026-2027 rulemaking cycle. She also presented information on the Periodic Review and Expiration of Existing Rules.

After the presentation, Chairman Corbett opened the floor to commissioners for comments and questions.

Motion by Commissioner Roller to approve final determination of rules per N.C.G.S. 150B-21.3A for the following:

- **15A NCAC 03Q .0100;**
- **All other rules in 15A NCAC 03;**
- **15A NCAC 10C .0100; and**
- **15A NCAC 18A .0100, .0300-.0900, and .3400.**

Second by Commissioner Hobgood.

ROLL CALL VOTE					
Member	**Aye**	**Nay**	**Abstain**	**Recuse**	**Absent**
Blanton	☒	☐	☐	☐	☐
Closs	☐	☐	☐	☐	☒
Gardner	☒	☐	☐	☐	☐
Hobgood	☒	☐	☐	☐	☐
Mallette	☒	☐	☐	☐	☐
Rader	☒	☐	☐	☐	☐
Roller	☒	☐	☐	☐	☐
Service	☒	☐	☐	☐	☐
Corbett	☒	☐	☐	☐	☐

Motion passed 8-0 (1 absent).

View the video recording of the presentation and surrounding discussion

Issues from Commissioners

Chairman Corbett opened the floor to commissioners for comments, questions, and other discussion.

Commissioner Hobgood shared feedback he had received from members of the public regarding potential red drum management measures ahead of the November meeting. Suggestions included game fish status, adjusting the slot, vessel limits, and concerns surrounding the harvest of large red drum and red drum tournaments. He also raised concerns about the significant increase in for-hire fishing operations in North Caorlina and requested that the Division examine available data, barriers to entry, and the associated impacts on fishing pressure and customer experience. He acknowledged that some considerations may fall under legislative authority but expressed interest in further understanding the issue.

Chairman Corbett noted that game fish status and barriers to entry for for-hire operations would require legislative action and would likely not be considered until February.

Commissioner Roller referenced the FMP Annual Report and requested additional analysis on whether the recently implemented sheepshead regulations are expected to reduce harvest as anticipated. He expressed concern that the fishery may be expanding due to new technology and that the resulting fishing activity may not be adequately captured through MRIP, particularly if it occurs in concentrated periods.

Commissioner Roller also referenced NCGS 113-168.6 regarding insurance requirements for commercial fishing vessel registrations with a for-hire endorsement. He questioned whether additional documentation could be required to verify insurance coverage before a license is issued, such as a letter of coverage or documentation through a National Park Service concessionaire license. He expressed concern about ensuring the growing for-hire industry is operating safely and in compliance with applicable requirements.

Commissioner Roller further noted that the public often associates for-hire operations with the commercial fishing industry, although these operations are managed under recreational rather than commercial quotas. He suggested that the Commission have a future discussion to help clarify how for-hire operations are managed. Chairman Corbett suggested that for-hire operations could be considered as a separate allocation category alongside commercial and recreational fisheries.

DRAFT

Commissioner Roller also raised concerns regarding compliance with South Atlantic Fishery Management Council (SAFMC) Red Snapper EFP requirements for for-hire operations. He noted the criticism the Division received regarding its limited joint enforcement authority and asked whether there are opportunities for additional enforcement of permit requirements. He also asked whether an educational outreach plan could be developed to help for-hire operators better understand the permit requirements.

Commissioner Rader asked when the Commission could expect additional information regarding sampling program 195, specifically how the loss of previously collected data will affect other programs, including stock assessments, and what adjustments may be necessary moving forward.

View the video recording of the Issues from Commissioners

Meeting Assignments and Preview of Agenda Items for Next Meeting

DMF Deputy Director Barbie Byrd reviewed meeting assignments and provided an overview of the November 2026 meeting items.

Having no further business to conduct, Chairman Corbett adjourned the meeting at 12:45 p.m.

DRAFT

NC Marine Fisheries Commission

Chairman's Report

November 2026 Quarterly Business Meeting

Documents

State Ethics Education Reminder

2027 Annual Meeting Calendar

MFC Workplan

EDUCATION REQUIREMENTS FOR PUBLIC SERVANTS

Public Servants must complete the Ethics and Lobbying Education program provided by the N.C. State Ethics Commission within **six months** of their election, appointment, or employment. We recommend that this be completed as soon as possible, but the training must be repeated every two years after the initial session.

Our new 90-minute on-demand online program is available on our website under the Education tab. For your convenience, here is the link. The new program is compatible with portable devices such as phones and tablets.

Live webinar presentations are also offered every month. These presentations are 90 minutes in length and give the opportunity to ask questions of the speaker. Registration information for those can be found here.

For questions or additional information concerning the Ethics Education requirements, please contact Tracey Powell at (919) 814-3600.

Marine Fisheries Commission 2027 Calendar

Dates are subject to change

January

Su	Mo	Tu	We	Th	Fr	Sa
						2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17		19	20	21	22	23
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31						

February

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28						

March

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28	29	30	31			

April

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May

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June

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July

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August

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29	30	31				

September

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October

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31						

November

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28	29	30				

December

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26		28	29	30	31	

2027 MFC Meeting Dates

MFC Business Meetings	Northern Regional AC	Southern Regional AC
February 17-18	January 5	January 6
May 12-13	March 9	March 10
August 18-19	June 8	June 9
November 16-17	September 8	September 9
Finfish AC	**Shellfish/Crustacean AC**	**Habitat & Water Quality**
January 7	January 12	January 13
March 11	March 16	March 17
June 10	June 15	June 16
September 14	September 15	September 16

Calendar Key

	MFC		Shellfish/Crustacean Standing AC
	Northern Regional AC		Habitat and Water Quality Standing AC
	Southern Regional AC		State Holiday
	Finfish Standing AC		Federal Commission or Council Meeting
	Joint Meeting of ACs for MFC Review and Presentation of Action Items		
	Joint Meeting of Northern, Southern, and Finfish AC		

Marine Fisheries Commission Workplan - November 2026

Note: all listed dates are tentative and are subject to change

Orange = Action Item		Green = No Action Necessary				
Topic	Aug 2026	Nov 2026	Feb 2027	May 2027	Aug 2027	Nov 2027
Active Management Plans						
Southern Flounder FMP Amendment 5	In Progress	In Progress	In Progress	Send Draft for AC/Public Review	Select Preferred Option	Final Approval
Kingfishes FMP Review	Indicator Analysis Results	Scoping Information Presented	In Progress	In Progress	Send Draft for AC/Public Review	Select Preferred Option
Red Drum FMP Review	In Progress	In Progress	Scoping Information Presented	In Progress	In Progress	Send Draft for AC/Public Review
Blue Crab FMP Review			Preliminary Information Presented	Scoping Information Presented	In Progress	In Progress
Coastal Habitat Protection Plan Update	Information Presented	Send Draft for AC/Public Review	Final Approval			
Rulemaking						
Atlantic Bonito Management	In Progress	Final Approval				
Periodic Review and Expiration of Existing Rules	Approve Final Determination	In Progress	In Progress	Vote on Readoption Schedule (tentative)		

Documents

MFC Nominating Committee Memo

MFC Nominating Committee Meeting Minutes

SAFMC At-large Seat Nominees Bios

MAFMC At-large Seat Nominees Bios

JOSH STEIN
Governor

D. REID WILSON
Secretary

JONATHAN HOWELL
Director

Oct. 28, 2026

MEMORANDUM

TO: N.C. Marine Fisheries Commission

FROM: Chris Batsavage, Special Assistant for Councils

SUBJECT: South Atlantic Fishery Management Council At-Large Seat and Mid-Atlantic Fishery Management Council At-Large Seat Nominations for North Carolina

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Issue
The N.C. General Statutes require the Marine Fisheries Commission to approve nominees for federal fishery management council seats for the governor's consideration, and that the statutes allow the governor to consult with the commission regarding additions to the list of candidates. The governor must nominate no fewer than three individuals for a federal fishery management council seat.

Findings
The Marine Fisheries Commission's Nominating Committee forwarded the following individuals to the Marine Fisheries Commission for the South Atlantic Fishery Management Council At-Large Seat and the Mid-Atlantic Fishery Management Council At-Large Seat:

South Atlantic Fishery Management Council At-Large Seat

- Tom Roller, charter boat captain from Carteret County and the current N.C. at-large member on the South Atlantic Fishery Management Council
- Brandy Carlton, recreational angler and tackle shop employee from Carteret County
- Chris Kimrey, charter boat captain from Carteret County
- Mike Oppegaard, charter boat captain from Topsail Island
- Jot Owens, charter boat captain from New Hanover County

Mid-Atlantic Fishery Management Council At-Large Seat

- Anna Beckwith, guide service owner from Carteret County and the current N.C. at-large member on the Mid-Atlantic Fishery Management Council
- Stuart Creighton, recreational angler from eastern North Carolina
- Bill Gorham, recreational angler from Dare County

Action Needed
The commission needs to approve nominees for the N.C. South Atlantic Fishery Management Council At-Large Seat and the N.C. Mid-Atlantic Fishery Management Council At-Large Seat.

For more information, please refer to:

- The draft minutes from the Oct. 14, 2026 Nominating Committee Meeting
- The nominees' biographies

JOSH STEIN
Governor

D. REID WILSON
Secretary

JONATHAN HOWELL
Director

October 28, 2026

MEMORANDUM

TO: N.C. Marine Fisheries Commission
Marine Fisheries Commission Nominating Committee

FROM: Chris Batsavage and Coral Sawyer
N.C. Division of Marine Fisheries

SUBJECT: Meeting of the Marine Fisheries Commission's Nominating Committee, October 14, 2026

The Marine Fisheries Commission's (MFC) Nominating Committee held a meeting on October 14, 2026, at the Division of Marine Fisheries Central District Office in Morehead City, NC.

The following were in attendance:

Committee members: Sarah Gardner – Chair, John Mallette, Tom Roller.

Commissioners: Sammy Corbett.

Division of Marine Fisheries (DMF) Staff: Chris Batsavage, Whitney Holl, Major Eddie Mann, Tina Moore, Coral Sawyer.

The following members of the public signed in: Brian Horsley, Lauren Salter.

Chair Gardner called the meeting to order at 6:00 p.m.

APPROVAL OF THE MINUTES FROM PREVIOUS MEETING

Motion by Commissioner Roller to approve the October 20, 2025, meeting minutes as presented.

Motion passed by unanimous consent.

PUBLIC COMMENT

There were no members of the public that provided comment.

REVIEW OF STATE AND FEDERAL REQUIREMENTS

Chris Batsavage briefly reviewed the N.C. General Statutes pertaining to the selection of nominees for federal fishery management council seats. He stated that the N.C. Marine Fisheries Commission must approve a slate of candidates for the governor's consideration, and that the statutes allow the governor to consult with the commission regarding additions to the list of candidates. Batsavage also described the federal statutes and regulations pertaining to qualification of candidates and notes that the governor must submit a list of no less than three nominees for an

appointment. The commission will review the list of candidates approved by the committee at its business meeting on November 17-18, 2026.

Commissioner Roller asked for clarification regarding council term lengths and term limits. It was clarified that council terms are three years, with a limit of three terms (nine years total). However, filling a vacant seat mid-term due to a member's resignation or passing does not count towards the individual's term limit. Chris Batsavage confirmed this interpretation.

SELECTION OF CANDIDATES

Chris Batsavage reviewed the bios of the candidates for the South Atlantic Fishery Management Council at-large seat, briefly describing the background and qualifications of each: Tom Roller, Brandy Carlton, Chris Kimrey, Mike Oppegaard, Jot Owens.

Chris Batsavage reviewed the bios of the candidates for the Mid-Atlantic Fishery Management Council at-large seat, briefly describing the background and qualifications of each: Anna Beckwith, Stuart Creighton, Bill Gorham.

There was no discussion of the individual candidates. Commissioner Roller commented that, based on his experience serving on councils, North Carolina does an excellent job of identifying qualified candidates for council appointments.

The committee discussed whether candidates removed from the list could be added back by the Marine Fisheries Commission. General discussion followed to clarify the process and determine whether the committee should identify a preferred candidate.

Motion by Commissioner Mallette to forward to the Marine Fisheries Commission for consideration the names of:

- **Tom Roller, Brandy Carlton, Chris Kimrey, Mike Oppegaard, and Jot Owens for the South Atlantic Fishery Management Council at-large seat.**
- **Anna Beckwith, Stuart Creighton, and Bill Gorham for the Mid-Atlantic Fishery Management Council at-large seat.**

Seconded by Commissioner Gardner.

Roll Call

John Mallette	**Aye**
Tom Roller	**Recuse**
Sarah Gardner	**Aye**

Motion passed, 2-0 with 1 recusal.

The meeting ended at 6:25 p.m.

Mr. Thomas N. Roller

Mr. Roller is the owner and operator of Waterdog Guide Service. For over 20 years, he has been a full-time nearshore and inshore light tackle and fly-fishing guide operating along the Crystal Coast of North Carolina. Mr. Roller is a licensed U.S. Coast Guard captain with extensive knowledge of southeastern North Carolina's waterways, and spends over 200 days on the water annually with clients. Species managed by the South Atlantic Fishery Management Council, including Spanish and king mackerel, amberjack, and many snapper grouper complex species are important mainstays of his guiding business.

Mr. Roller has served two terms on the South Atlantic Fishery Management Council as an active participant and leader in the Council process. He currently serves as the Chair of the Habitat and Ecosystem Committee, Chair of the Mackerel/Cobia Committee, Chair of the Outreach and Communication Committee, Vice Chair of the Dolphin/Wahoo committee and Vice Chair of the Law Enforcement Committee. He also previously served as Vice Chair of the Citizen Science Committee. In addition, he is the current Council representative on NOAA's High Migratory Species Advisory Panel, and routinely serves as a liaison to both the Mid-Atlantic and Gulf of Mexico Fishery Management Councils. He is also an active participant in the SEDAR stock assessment process having been the Council representative on SEDAR 78 (Spanish Mackerel), SEDAR 94 (hogfish) and the upcoming SEDAR 108 (black seabass) and SEDAR for snowy grouper. Prior to being appointed to the South Atlantic Fishery Management Council, he served on the Council's Cobia/Mackerel Advisory Panel, Systems Management Plan workgroup and Citizen Science Advisory Panel and served 6 years on the MAFMC Bluefish Advisory Panel.

Mr. Roller is also a longtime participant in North Carolina's state fisheries management process. In February 2020 Mr. Roller was first appointed to the North Carolina Marine Fisheries Commission by Governor Roy Cooper and has served three consecutive terms in the Recreational Industry Seat. He continues to serve in this capacity under Governor Josh Stein.

Mr. Roller is a strong advocate for informed involvement in the management process. In 2017 he completed the Gulf of Maine Research Institute's Marine Resource Education Program and encourages others to participate in MREP's education opportunities. He encourages students to learn about the fisheries management process and regularly serves as a guest speaker and informal mentor to graduate students in the marine science community. Mr. Roller also contributes on-the-water experience to support data collection for management and stock assessment. He volunteered as a field tester to refine the South Atlantic region's electronic for-hire logbook software, and participates in multiple ongoing fish tagging and fin clip studies for the American Saltwater Guides Association and their scientific partners.

Mr. Roller is a founding member of the American Saltwater Guides Association, a coastwide organization with the mission of promoting sustainable business through marine conservation. He currently serves as an executive board member representing the state of North Carolina. He was previously a member of the Executive Board of the Coastal Conservation Association of North Carolina from 2014 to January 2020 and served on the organization's Fisheries Committee as chairman from February 2016 to 2018.

Mr. Roller received a B.A. in English and history from Duke University in 2003 and resides in Beaufort, North Carolina.

To: Commissioner Sammy Corbett, Chairman
North Carolina Marine Fisheries Commission
From: Thomas N. Roller
[redacted]

Re: Consideration for Reappointment to the At-Large Seat of the South Atlantic Fishery Management Council

Dear Chairman Corbett,

I am pleased to submit my name as a candidate for reappointment to the At-Large seat on the South Atlantic Fishery Management Council. My resume and bio are enclosed.

Since 2003 I have been the owner and operator of Waterdog Guide Service. As a professional guide I provide customized inshore and nearshore light tackle and fly-fishing experiences for families and experienced anglers along North Carolina's Crystal Coast. As a full-time working waterman and active participant in the management process, I bring a unique and balanced perspective as well as extensive knowledge of North Carolina's diverse recreational and commercial fishing industries.

Our state is blessed with diverse fisheries that range from our inshore estuaries to the Gulf Stream. On any given day, I interact with species managed by the state of North Carolina, the Atlantic States Marine Fisheries Commission, and the South Atlantic Fishery Management Council. Like many of our state's recreational and for-hire fishermen, I value the opportunity to target a wide variety of species. I understand the importance of access to both our state and federally managed fisheries to businesses and anglers, and this understanding of the bigger picture helps me be a more effective representative for our state's interests.

In addition to my on-the-water and business experience, I bring my strong commitment to being a well-informed stakeholder and representative for the state of North Carolina as a state commissioner and a SAFMC council member. In my two terms on the SAFMC, I sought opportunities to serve in a leadership role, including as Chair of the Mackerel Committee, which guides the management of two of North Carolina's most important recreational and commercial fisheries. As a Council member I have also been involved in efforts to address emerging challenges through the Council's work on resilient fisheries, habitat, and modernizing data collection. I am also personally committed to encouraging the next generation of stakeholders to become involved in the fisheries management process.

I would be honored to continue representing the state of North Carolina on the South Atlantic Fishery Management Council and thank you for your consideration.

Sincerely,

Tom Roller

THOMAS NATHANIEL ROLLER

SUMMARY OF QUALIFICATIONS

- Successful small business owner, for-hire fishing industry leader, and ecotourism professional; U.S. Coast Guard licensed captain with over 20 years of experience.
- Experienced industry leader currently serving on the South Atlantic Fishery Management Council and the North Carolina Marine Fisheries Commission; active participant with in-depth knowledge of federal, interstate, and state fisheries management processes.
- Skilled communicator able to facilitate collaboration and compromise with diverse stakeholders and communicate the interests of North Carolina's valuable recreational fishing industry.

PROFESSIONAL EXPERIENCE

Waterdog Guide Service • Beaufort, NC
Founder, owner, and operator • 2003–present

Professional full-time guide providing customized inshore and nearshore light tackle and fly-fishing experiences for families and experienced anglers along North Carolina's Crystal Coast. Expert waterman and ecotourism industry professional averaging 200+ days on the water annually.

South Atlantic Fishery Management Council
North Carolina At Large Seat • August 2021—present.

Currently serving as Chairman of the Mackerel Cobia Committee, Chairman of Outreach & Communications Committee, Chairman of the Habitat and Ecosystem Committee, Vice Chair of the Dolphin/Wahoo Committee, and Vice Chair of the Law Enforcement Committee. Previously served as Vice Chair of the Citizen Science Committee. Current SAFMC representative on NOAA Highly Migratory Species advisory panel. Served as a Council liaison to the Gulf of Mexico and Mid-Atlantic Fishery Management Councils. Participant in the East Coast Climate Change Scenario Planning initiative and SAFMC representative on upcoming East Coast Governance Workshop.

SAFMC observer in SEDAR 78 (Spanish Mackerel), SEDAR 94 (Hogfish) and upcoming SEDAR 108 (black seabass) and the upcoming snowy grouper SEDAR.

North Carolina Marine Fisheries Commission
Recreational Industry Seat • Jan. 2020—present. Reappointed August 2023 to third term.

Appointed by Governor Roy Cooper to the North Carolina Marine Fisheries Commission, the rulemaking commission charged with managing the state's estuarine and marine living resources. Currently serving as chairman of the Finfish Advisory Committee, and member of the Coastal Recreational Fishing License Advisory Committee and the Nominating Committee.

American Saltwater Guides Association (ASGA)
North Carolina Representative & Executive Board Member January 2019—present, Policy Committee Member March 2019—present

Founding member and current voting board member, helping to provide an organized voice for recreational fishing industry with the mission of promoting sustainable business through marine conservation. Active contributor to organizational development of policy positions on fisheries issues at the federal and interstate levels.

Coastal Conservation Association – North Carolina (CCANC)
Executive Board Member January 2014—January 2020, Fisheries Committee Member April 2013—January 2020, Fisheries Committee Chairman February 2015—December 2017

Voting board member, promoting the conservation and sustainable management of inshore fisheries and coastal resources in North Carolina. Developed policy statements on recreational, commercial, and resource management issues for communication with state and federal management agencies, stakeholders, and the public

OTHER EXPERIENCE

Scientific Collaborator with the American Saltwater Guide Association
Participated and helped organize multiple data collection programs organized by ASGA including false albacore tagging and genetic sampling and testing of new app-based data collection for valuable east coast fisheries. 2022-present. Worked on a joint multi-year ASGA and The Nature Conservancy Atlantic Bonito telemetry tagging study 2025-present.

Federal and State Fishery Advisory Panels

North Carolina Division of Marine Fisheries
- Southern Flounder Fishery Management Plan Advisory Committee Member, September 2017—Jan. 2020
- Blue Crab Fishery Management Plan Advisory Committee Member, February 2017—Jan. 2020
- Joint Enforcement Agreement working group member, June 2016

Mid-Atlantic Fishery Management Council
- Bluefish Advisory Panel, May 2015—present

South Atlantic Fishery Management Council
- Electronic For-hire Logbook Field Tester, May 2016—2018
- Mackerel Cobia Advisory Panel, March 2017—2021
- Citizen Science Advisory Panel Communication and Outreach Action Team, June 2017—2019
- System Management Plan Workgroup March 2018—2021

Invited Presenter, Data and Management Strategies for Recreational Fisheries with Annual Catch Limits
Committee meeting in support of study convened by the National Academies of Science, September 2020

Graduate, Gulf of Maine Research Institute Marine Resources Education Program – Southeast
- Fisheries Science Workshop, completed May 2017
- Fisheries Management Workshop, completed November 2017

HONORS AND AWARDS

2022 Governors Award Marine Conservationist of the Year
Awarded by the North Carolina Wildlife Federation · Sep 2022

EDUCATION
Bachelor of Arts, 2003 • English and History
Duke University, Durham, North Carolina

INDUSTRY QUALIFICATIONS
- U.S. Coast Guard Operator of Uninspected Passenger Vessel (OUPV) license holder
- North Carolina Division of Marine Fisheries licensed for-hire operator
- South Atlantic Fisheries Management Council permitted for-hire operator, Coastal Migratory Pelagics, Grouper Snapper Complex and Dolphin/Wahoo fisheries
- National Marine Fisheries Service permitted Highly Migratory Species (HMS) for-hire operator

BRANDY RAE CARLTON

[redacted]

Federal Fishery Management Council Nomination

I am a North Carolina coastal business owner, consultant, and active participant in the recreational fishing community, with a strong interest in responsible fisheries management, marine conservation, and the long-term sustainability of coastal communities.

My husband owns Reel Tease Outdoors, a local, family-owned and operated fishing and outdoor retail business on the Atlantic Beach Causeway in North Carolina. I am actively involved, sharing responsibility for staying informed about fisheries laws, regulations, rules, management decisions, and proposed changes. We engage customers in educational conversations about how these matters affect anglers, fishing businesses, and coastal communities.

Our family fishes offshore for marlin, sailfish, and mahi-mahi and participates in coastal fishing and seafood harvesting involving flounder, shrimp, scallops, and crab. Our family participates annually in the Big Rock Blue Marlin Tournament, strengthening our connection to North Carolina's offshore recreational fishing community. My husband owns an offshore fishing vessel and is pursuing his U.S. Coast Guard captain's license, with plans to establish a charter business serving offshore anglers. Through the shop, our knowledge and conversations extend beyond the species we personally pursue.

My husband and I operate four businesses, giving us firsthand experience with coastal commerce, tourism, recreation, and local economic development. We prioritize supporting local businesses, and Reel Tease Outdoors purchases locally whenever practical. I also own and operate Hive & Helm, a local hospitality company that connects visitors with fellow small businesses offering locally sourced products, services, and coastal experiences, including inshore and offshore fishing charters, recreational boating, sightseeing tours, and sunset cruises. These relationships support our coastal economy and broaden our understanding of how tourism, marine recreation, and fisheries management intersect.

I also own Nature's Way Counseling & Consulting. My consulting background has strengthened my ability to listen to different perspectives, evaluate concerns, and communicate complex information thoughtfully. I do not automatically favor one industry or stakeholder group over another; I believe sound decisions require scientific evidence, applicable laws and regulations, and consideration of both conservation needs and the practical consequences for communities.

I recognize that fisheries are influenced by far more than fishing practices alone. Water quality, coastal development, habitat preservation, pollution, recreational boating, tourism, and changing environmental conditions all affect marine ecosystems. Effective management requires examining these interconnected influences rather than placing responsibility on any single group.

I would be honored to be considered for the opportunity to serve on a federal fishery management council. I recognize the responsibility such a position carries and would approach it with an open mind, a willingness to listen and learn, and a commitment to evaluating issues from multiple perspectives. My goal would be to contribute thoughtful, informed judgment that respects scientific evidence, supports responsible conservation, and considers the long-term interests of our marine resources and the diverse communities and industries that depend upon them.

Christopher G. Kimrey

Mr. Kimrey was enlisted in the United States Navy for 6 years and served as an electronics technician for 5 years, before being honorable discharged due to a service-connected injury. He graduated with honors from Carteret Community College in 2003 with an associate in arts. He is a PADI Certified Rescue Diver and licensed U.S. Coast Guard Captain (OUPV).

Mr. Kimrey has owned and operated Custom Saltwater Taxidermy, creating replicas of fish for customers worldwide since 1997. For the past 19 years he has been a full-time saltwater fishing guide and owner and operator of Mount Maker Charters. Mr. Kimrey has completed the first of 2 sessions of the Marine Resource Education Program with the Gulf of Maine Research Institute and is scheduled to complete the 2nd session in the near future (delayed due to COVID-19).

Mr. Kimrey was recently reappointed to the SAFMC Snapper/Grouper Advisory Panel for his third term and is currently Chair of the Advisory Panel after serving as Vice-Chair for one year. He as been an active participant in several tagging projects with N.C. State University, and N.C. Division of Marine Fisheries, which included a 3-year acoustic tagging project of Cobia and a 5-year anchor tagging project with weakfish as well as several other cooperative fisheries research programs. He was an active participant in the software pilot program for the For-Hire South Atlantic Fishery Management Council Pilot Project. He has attended various public forums at the State and Federal level pertaining to Marine Fisheries.

Mr. Kimrey has a life-long history of recreational and commercial fishing and a vast knowledge of saltwater fisheries. Many years of following State and Federal fisheries management plans, while spending 200+ days annually on the water gives him a unique and unbiased desire to pursue the conservation of our fisheries.

Michael R. Oppegaard

Mr. Oppegaard is a native of Topsail Beach, North Carolina, and a graduate of Topsail High School and the University of North Carolina-Chapel Hill. His family owned the Sound Pier until its sale in 2004 and has spent his entire life on the water.

In 2012, he founded Native Son Guide Service, Inc., a nearshore/inshore fishing guide service that targets red drum, black drum, flounder, speckled trout, king mackerel, Spanish mackerel, black sea bass, sheepshead, cobia, bonito, false albacore, and sharks. He is passionate about sharing his love of fishing with others and is committed to providing his clients with the best possible fishing experience.

Mr. Oppegaard is also actively involved in the management of North Carolina's fisheries. He currently serves on the NC Marine Fisheries Commission's Southern Regional Advisory Committee and the South Atlantic Fishery Management Council's Mackerel Cobia Advisory Panel. He also served on the NC Southern Flounder Fishery Management Plan Advisory Committee and the MAFMC Management Strategy Evaluation for Summer Flounder as a Core Stakeholder. He is committed to working with other stakeholders to ensure the sustainable management of our fisheries for future generations.

E. Jot Owens

Capt. Jot Owens has been in the Southeast North Carolina Fishing industry for over thirty years. Capt. Jot began his fishing career when he was just fourteen years old working at a local fish market and commercial fishing. Commercial fishing included Clamming, Shrimping, Tuna (Blackfin, Bluefin and Yellowfin), Grouper and King Mackerel fishing (Outer Banks to Cape Fear, NC). Jot fished many inshore and offshore tournaments over the years from the Outer Banks to the Florida Keys. In 1995, Jot started as a mate on local charter fishing boats out of Wrightsville Beach, NC. Today, Capt. Jot has managed to translate his lifetime passion for fishing and guiding into his own charter business which he began in 1999 with a USGC Captains License 100-ton six-pack. Guiding for Cobia, King & Spanish Mackerel, Flounder, False Albacore, Grouper, Red drum, Sharks, Speckled trout, and Tarpon. Capt. Jot is one of the very few local native guides of Southeast North Carolina. He is also a Federal and State of North Carolina Finfish Tagger, April 2003 – present Tagging for conservation and scientific research of Cobia, Flounder, Redfish, Speckled Trout, Striped Bass and Sharks.

Capt. Jot is a member of the PENN fishing tackle, Berkley Fishing and Spiderwire's Elite Pro Staff as well as on the research, development, and test team for these companies. He is also honored to be partnered with these great outdoor companies as well MirrOlure, YETI coolers, Power-Pole, Plano, Frabill, Betts Cast-nets, Garmin Marine, SiriusXM Marine, Eagle Claw/Trokar hooks and Smith Optics.

Capt. Jot has been featured on TV shows; Flats Class TV with C.A. Richardson, The World of Saltwater with George Poveromo, Bob Redfern's Outdoor Magazine, National Geographic Wild's (NATGEO) and ESPN's Saltwater Connection. Capt. Jot has been featured in hundreds of fishing magazine articles in Sport Fishing magazine, NC Sportsman magazine and SC Sportsman magazine just to name a few. Capt. Jot is a regular speaker on the Saltwater Sportsman National Seminar series with George Poveromo, as well hosting his own inshore fishing school.

Fisheries organizations and boards:

-Cape Fear River Striped Bass Foundation-To re-establish and maintain the Cape Fear River Fishery, 2008-present

-Tournament Director/Guide Chair for the Cape Fear River Watch Striped Bass Tournament to raise money and awareness in the fish restoration of the Cape Fear River system, 2008-2020

-Saltwater Angler & Sportsman (E-magazine) - Board of Directors 2014-present

-Cape Fear River Watch Board of Directors, 2008-2021

-NCDMF Striped Bass FMP Advisor 2021

-WQ4F (Water Quality for Fisheries) Industry Working Group-Water Quality for Fisheries 2021-2022

-North Carolina Sea Grant Advisory Board-Representing Recreational anglers and Charter (Guides) interest, 2009-2019

-StriperFest Director-Directed all committees for highest grossing fundraiser for Cape Fear River Watch, 2015.

-South Atlantic Fishery Management Council's System Management Plan Workgroup. 2024-present.

-South Atlantic Fishery Management Council's Cobia/Mackerel Advisory panel. 2025-present.

Ms. Anna Beckwith

Ms. Beckwith holds a B.S. degree in Environmental Science and Policy from Florida International University in Miami, FL and a M.S. degree in Biological Oceanography with a Minor in Geographic Information Science from N.C. State University in Raleigh, NC.

Ms. Beckwith is currently serving in her first term on the Mid Atlantic Fishery Management Council. She serves as vice chair of the HMS committee and is the liaison to the SAFMC.

Ms. Beckwith served three consecutive terms on the South Atlantic Fishery Management Council. Her last term ended August 2021. On the SAFMC she serves as an at-large seat and was chair of the Dolphin/Wahoo, and Highly Migratory Species (HMS) Committees. As Chair of the HMS Committee she also serves on the HMS Advisory Panel for the National Marine Fisheries Service and the ICCAT Advisory Committee. She attended the International Commission for the Conservation of Atlantic Tunas (ICCAT) 2014, 2015 and 2016 annual meeting as part of the U.S. delegation. Ms. Beckwith has also served as liaison to the Gulf of Mexico Fishery Management Council and the Mid Atlantic Fishery Management Council on numerous occasions. Ms. Beckwith has also served as a Council representative on King Mackerel, Cobia, Blueline Tilefish and Red Snapper stock assessments.

Ms. Beckwith served on the N.C. Marine Fisheries Commission from 2009 to 2015, serving as Vice-Chair from 2011 to 2015.

Ms. Beckwith owns Down East Guide Service, a North Carolina recreational fishing guide service and international travel agency for sport fisherman specializing in Costa Rica and Argentina. She is the managing partner of Dragin Fly Sportfishing based out of Los Suenos Marina Costa Rica.

Prior to 2007 Ms. Beckwith taught Environmental Science and Biology at the high school level and sixth, seventh and eighth grade science in eastern North Carolina. She was a research consultant (post-graduate work) from 2004 through 2006 monitoring red drum spawning habitat using passive acoustics, water quality, and egg/larval monitoring in the Neuse River Estuary, Pamlico River, Pamlico Sound and Ocracoke Inlet.

Previous to pursuing her graduate degree Ms. Beckwith was employed as Program Manager (1999-2001) for the American Farmland Trust in Washington, DC and was a marine fellow for The Nature Conservancy (1999).

Anna Barrios Beckwith

Experience

8/2007 – current Down East Guide Service/Dragin Fly Sport fishing
Title: President
Assure smooth operation of North Carolina and Costa Rican operations.

8/2024 – 8/2027 Mid Atlantic Fishery Management Council
Title: At Large Voting Member
Vice Chair of the HMS committee and liaison to the South Atlantic Fishery Management Council.

8/2012 – 8/2021 South Atlantic Fishery Management Council
Title: At Large Voting Member
Chair of Dolphin/Wahoo, and HMS Committees. As Chair of the HMS Committee, I also served on the HMS advisory panel for NMFS and on the ICCAT Advisory Committee (*Currently still serving as an advisor*). I attended the ICCAT 2014, 2015 and 2016 annual meeting as part of the US delegation. I also served as a Council representative on King Mackerel, Cobia, Blueline Tilefish and Red Snapper stock assessments. As council liaison to the Gulf of Mexico and Mid-Atlantic Fishery Management Councils I typically attended their meetings one per year per council.

7/2009 – 7/2015 NC Marine Fisheries Commission Morehead City, NC
Title: At Large Voting Member (Vice Chair)
Served on the Habitat and Water Quality, Coastal Habitat Protection Plan, joint MFC/WRC Coastal Recreational Fishing License and the Finfish and Shellfish/Crustacean committees.

8/2006 – 8/2007 Christ the King H.S. New Bern, NC
Title: Science Teacher
Taught Environmental Science and Biology.

8/2005 – 8/2006 Tiller Middle School Morehead City, NC
Title: Science Teacher
Taught sixth, seventh and eight grade science.

5/2004 – 8/2006 Consultant/Self-employed Morehead City, NC
Title: Research Consultant
Monitor red drum spawning habitat in the Neuse River Estuary, Pamlico River, Pamlico Sound and Ocracoke Inlet of North Carolina using passive acoustics, water quality and egg/larval sampling techniques.

5/2002 – 5/2004 North Carolina State University Raleigh, NC
Title: Research Assistant
Identified red drum spawning habitat in the Neuse River Estuary of North Carolina using passive acoustics, water quality, and egg/larval monitoring

8/2001 – 5/2003 North Carolina State University Raleigh, NC
Title: Teaching Assistant
Instructed laboratory-based classes in Oceanography, Earth System Science, and Biology.

9/1999 – 7/2001 American Farmland Trust Washington, DC

Title: Program Manager

Responsibilities included managing multiple policy initiatives, advocating for increased federal funding of conservation programs, organizing a grass roots policy network, assisting regional offices with state campaigns, and coordinating initiatives with partner organizations including "Keep America Growing", a network of interagency and non-governmental organizations focused on urban and suburban land use issues, and a partnership with the U.S. Conference of Mayors leading to "Town Meets Country: Farm-City Forum on Land and Community". These forums brought urban, suburban, and rural leaders into discussions on smart growth issues throughout the country.

5/1999 – 8/1999 The Nature Conservancy Key West, FL

Title: Lattner Marine Fellow/Coastal Initiative Program

Responsibilities focused on identifying appropriate wastewater treatment options and possible funding sources for upgrades of failing systems in the Florida Keys and dissemination to local community and assisted in advocacy efforts for funding in Washington, DC.

Education

8/2001 – 8/2004 North Carolina State University Raleigh, NC

- Masters of Science in Biological Oceanography.
- Minor in Geographic Information Science.
- Graduated Summa Cum Laude.
- Honors included: NCSU Sea Grant Fellowship, PADI Foundation Grant, NCSU Marine Department "Excellence in Teaching" award.
- Activities included: Treasurer of the Marine, Earth and Atmospheric Graduate Association.

8/1995 – 5/1999 Florida International University Miami, FL

- Bachelors of Science in Environmental Science and Policy.
- Minor in Biology.
- Graduated Cum Laude.
- Honors included: Lattner Fellowship to work with The Nature Conservancy, FIU Departmental "Excellence in Academic Achievement" award, FIU Departmental "Excellence in Service to the Environment" award, Florida Undergraduate Scholarship, University Scholarship, Dean's list 7 (of 8) semesters.
- Activities included: Marine Mammal Rescue Unit (officer), Marine Animal Rescue Society (volunteer and organizer), Golden Key National Honor Society (Director of Environmental Activities), and Phi Eta Sigma National Honor Society.

Languages and Certifications

- Spanish: Spoken (Excellent), Written (Well). First generation Cuban America.
- N.C. SPI Teaching License Middle Grades Science (6-9)

Stuart Creighton

Mr. Creighton graduated from NC State University with a BS in Meteorology and received his secondary education certification from Campbell University before completing a 25-year career as a high school science educator in North Carolina. During his career, he had experience teaching the full spectrum of science classes from fundamental Earth Science to AP Physics. In semi-retirement, he currently serves as a property manager in Oriental, a town with which he has had a lifelong connection. Mr. Creighton has been a passionate recreational fisherman on the Neuse River throughout his life, and, because of that passion, he has become very active in current fishery management issues.

His activity began in 2015 when he became a regular attendee and public speaker at the quarterly Marine Fisheries Commission meetings. Mr. Creighton has served as the CCA NC Fisheries Committee Chairman since 2020 and is also a Vice President of the CCA State Board. His responsibilities in this role included keeping current on state and federal issues, examining data to determine pending management problems, and writing content on what management measures are necessary to correct them. Mr. Creighton was hired as CCA NC's Eastern Regional Director in March of 2025. In addition to continuing advocacy on important fisheries issues, he is now responsible for chapter development, fundraising, and new member recruitment. Content creation is also an important component of this position with respect to the various parts of this position.

In addition to his work with CCA NC, Mr. Creighton has served as an Advisory Committee member for the NC Estuarine Striped Bass and NC Spotted Sea Trout Fishery Management Plans (FMPs). He is also a Southern Flounder Advisory Committee member that will help with the development of Amendment 5 to the NC Southern Flounder FMP.

Over the past decade, Mr. Creighton has fished up and down the North Carolina coast, exploring the different fisheries available from Weldon to Wrightsville Beach. He is very well studied on the challenges that are present at both the state and national level and will work hard to make sure that our marine resources are not only conserved, but rebuilt, so that everyone may continue to use them responsibly.

William Gorham

Mr. Gorham is the former owner of Bowed Up Lures, a fishing lure manufacturer based in Dare County, North Carolina. Through his work serving anglers across the Atlantic and Gulf coasts, he developed extensive knowledge of recreational fisheries and the challenges facing coastal communities.

Mr. Gorham has been actively involved in both state and federal fisheries management for several years. He served as a proxy for North Carolina's Legislative Appointee to the Atlantic States Marine Fisheries Commission (ASMFC) and was a member of the South Atlantic Fishery Management Council's Mackerel-Cobia Advisory Panel and Citizen Science Advisory Panel.

He was also selected to participate throughout the SEDAR 58 Cobia Stock Assessment process, contributing stakeholder perspectives during each phase of the assessment.

In addition to his advisory roles, Mr. Gorham has assisted with stakeholder outreach and public education on a variety of fisheries management proposals. He has also contributed to multiple grant proposals and supported data collection efforts for fisheries research projects conducted by North Carolina State University and the Virginia Institute of Marine Science (VIMS).

Through his experience as a business owner, fisheries advocate, advisor, and research collaborator, Mr. Gorham brings a practical, science-informed perspective to fisheries management and conservation.

NC Marine Fisheries Commission

Director's Report

November 2026 Quarterly Business Meeting

Documents

Mid-Atlantic Fishery Management Council
October 2026 Meeting Report

South Atlantic Fishery Management Council
September 2026 Meeting Report

Rule Suspensions Memo

L&S Annual Report Memo

October 2026 Council Meeting Summary

The Mid-Atlantic Fishery Management Council met October 6-8, 2026, in Duck, NC. This document summarizes key actions taken and issues considered during the meeting. Presentations, briefing materials, motions, and webinar recordings are available on the Council's October 2026 meeting page.

HIGHLIGHTS

During this meeting, the Council:

- Agreed to initiate a joint amendment with the New England Council to consider revisions to vessel baseline restrictions, contingent on similar action by the New England Council in December.
- Initiated a framework action to consider modifications to the scup gear restricted areas and/or alternative measures to reduce scup discards.
- Maintained the previously adopted 2027 Illex squid specifications, including a commercial quota of 38,631 MT.
- Considered potential approaches for increasing the U.S. Illex quota and agreed to revisit the issue in December.
- Maintained the previously adopted 2027 Atlantic mackerel specifications, which include an increase in the commercial quota to 13,210 MT, subject to a potential payback adjustment.
- Reviewed a new longfin squid stock assessment that represents a significant scientific advancement and will inform catch limits for 2027-2029.
- Maintained the previously adopted 2027 spiny dogfish specifications, including a commercial quota of 9.2 million pounds.
- Reviewed recommendations for further developing an approach to apportioning blueline tilefish catch between the Mid-Atlantic and South Atlantic Councils.
- Received updates on NOAA Fisheries' habitat consultation activities and major coastal and offshore projects in the Mid-Atlantic.
- Reviewed a draft regional framework for administering fisheries compensation funds associated with future offshore wind projects.
- Received an update on scoping for potential measures to reduce whale entanglement risks in commercial fixed-gear fisheries.
- Reviewed proposed actions and deliverables for 2027, with a draft Implementation Plan scheduled for Council consideration in December.

Evaluation of Vessel Baseline Restrictions

The Council reviewed an evaluation of vessel baseline restrictions conducted jointly with the New England Council. These restrictions limit potential increases in vessel length and horsepower for many limited access commercial fisheries managed by both Councils. The evaluation was intended to help determine whether to prioritize a joint management action to consider revisions to these restrictions.

The Council acknowledged the complexity of the issue, noting that potential challenges and benefits vary by fishery, gear type, and vessel size. Members also discussed how vessel baseline restrictions intersect with other regulations, including the prohibition on permit splitting.

The Council agreed to initiate an omnibus amendment to consider potential revisions, contingent on the New England Council taking similar action at its December 2026 meeting. If both Councils agree to move forward, public scoping hearings and initial development of management alternatives would be expected to take place in 2027.

Scup Gear Restricted Areas

The Council reviewed background information on the commercial scup gear restricted areas (GRAs), findings from the Council-funded scup GRA project, and input from the Scientific and Statistical Committee (SSC). The GRAs were implemented in 2000 to reduce juvenile scup discards in small mesh trawl fisheries, including longfin squid, black sea bass, and silver hake. The project evaluated potential modifications to the GRAs by examining spatial patterns in scup and longfin squid abundance and assessing socioeconomic impacts on the fishing industry. The results suggest that fixed time-area closures may not be an effective approach for mitigating scup discards in the small mesh squid fishery. The SSC concluded that the project's findings are scientifically supported by the available data and analytical approach. Based on this information, the Council agreed to initiate a framework action to consider modifications to the GRAs and/or alternative measures to reduce scup discards.

2027 *Illex* Squid Specifications

After considering the recommendations of the SSC, Advisory Panel, and the Monitoring Committee, the Council agreed to maintain the previously adopted 2027 specifications for *Illex* squid. These specifications were adopted in 2025 as part of the 2026–2028 multiyear specifications and would remain unchanged for 2026 and 2027. After accounting for expected discards, the commercial quota would again be 38,631 metric tons (MT).

Northwest Atlantic Fisheries Organization (NAFO) *Illex* Quota Issues

The Council reviewed the possibility of increasing the U.S. *Illex* quota in years when U.S. landings are high and catches in the Northwest Atlantic Fisheries Organization (NAFO) area are low. The SSC concluded that these conditions have not been shown to reliably indicate when a higher U.S. quota would be consistent with the Council's risk policy. Based on the SSC's findings and staff recommendations, the Council decided not to pursue further action at this time. However, members discussed other approaches to evaluating whether higher catch limits may be warranted, including whether relatively large squid sizes could support an increase. The Council will revisit this topic in December 2026 as it finalizes the 2027 Implementation Plan.

2027 Atlantic Mackerel Specifications

After considering recommendations from the SSC, Advisory Panel, and the Monitoring Committee, the Council agreed to maintain the previously adopted 2027 specifications for Atlantic mackerel. These specifications were adopted in 2025 and would provide for a slight increase from 2026 to 2027, consistent with the rebuilding projections.

After accounting for Canadian landings, recreational catch, and commercial discards, the 2027 commercial quota would increase from 11,237 MT to 13,210 MT. However, a payback from a 2025 overage may reduce the 2027 quota by about 1,100 MT. This adjustment would be made automatically by NOAA Fisheries under existing Atlantic mackerel regulations.

Longfin Squid Research Track Assessment

Kristan Blackhart of the Northeast Fisheries Science Center presented results from a new Research Track stock assessment for longfin squid. The assessment represents a significant scientific advancement, producing two analytical stock assessment models for a stock that previously lacked such models. Both models passed peer review, and results suggest that fishing mortality has been relatively low compared with proposed reference points. The assessment also provided additional information on longfin squid biology and the influence of environmental conditions on the stock. The SSC will review the assessment in November 2026 and develop recommendations for 2027-2029 catch limits, which the Council will consider at its December 2026 meeting.

2027 Spiny Dogfish Specifications

After considering recommendations from the SSC, Advisory Panel, and Monitoring Committee, the Council agreed to maintain the previously adopted 2027 specifications for spiny dogfish. These specifications were adopted in 2025 and would remain unchanged for 2026 and 2027. After accounting for minor Canadian landings, minor recreational landings, and substantial expected discards, the commercial quota would again be 9.2 million pounds.

Joint MAFMC and SAFMC Blueline Tilefish Subcommittee

The Council reviewed recommendations from the Joint MAFMC and SAFMC Blueline Tilefish Subcommittee. The subcommittee was established to develop a framework for apportioning the blueline tilefish acceptable biological catch (ABC) north of Cape Hatteras between the two Councils' jurisdictions. The subcommittee recommended further development of a weighted rubric incorporating fishery-independent survey information, commercial and recreational fishery information, and the current 70% MAFMC/30% SAFMC proportional split, along with supporting analyses to inform each category. The Council expressed general support for the subcommittee's recommendations and continued collaboration between the two Councils on blueline tilefish.

Habitat Activities Update

Karen Greene of the NOAA Fisheries Greater Atlantic Regional Fisheries Office (GARFO) Habitat and Ecosystem Services Division (HESD) provided updates on coastal resilience, marine mineral mining, dredging, and large infrastructure projects in the Mid-Atlantic. To date in 2026, there have been 569 requests for habitat consultation in our region. Given this workload and a staff of 11 responsible for Essential Fish Habitat (EFH) consultations, Ms. Greene highlighted efforts to improve efficiency through greater use of general concurrences and programmatic consultations with agencies such as the U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, and Federal Emergency Management Agency. Council Chair Joe Cimino emphasized the importance of EFH consultations and noted the value of HESD's engagement on these projects to state agency partners.

Regional Offshore Wind Fisheries Compensatory Mitigation Fund

The Council received a presentation on a draft Regional Offshore Wind Fisheries Compensation Framework, developed collaboratively by 11 East Coast states, federal agencies, commercial and for-hire fisheries representatives, and offshore wind energy project developers. The framework proposes a regional approach for administering fisheries compensatory mitigation funds associated with future offshore wind projects. The initiative is not responsible for determining the amount of compensation funding provided by individual projects. Instead, it focuses on how funds could be administered and distributed to eligible fishermen. A public comment period on the draft is open through November 3, 2026. Additional information is available here.

Atlantic Large Whale Take Reduction Plan (ALWTRP) Scoping

Corie Grewal and Jennifer Goebel of GARFO presented an update on scoping for potential future ALWTRP modifications. The scoping process, which included a public comment period ending October 16, 2026, was intended to solicit public input on strategies to reduce entanglement risks to North Atlantic right, humpback, and fin whales in commercial fixed-gear fisheries along the U.S. East Coast. No specific changes have been proposed at this stage. The Atlantic Large Whale Take Reduction Team is tentatively scheduled to meet in December 2026 to begin developing recommended risk-reduction measures for NOAA Fisheries' consideration. Additional information is available here.

2027 Implementation Plan

The Executive Committee reviewed progress on the 2026 Implementation Plan and a draft list of actions and deliverables for 2027. The Council develops annual Implementation Plans to guide its work and ensure progress toward the goals and objectives of its five-year strategic plan. The Committee recommended several modifications to the proposed 2027 actions and deliverables. The full Council will review a draft 2027 Implementation Plan at its December meeting.

Next Council Meeting

The Council will meet jointly with the ASMFC Policy Board on Thursday, November 12, 2026, to receive a report from the Recreational Sector Separation Workshop. The next full Council meeting will be held December 15-17, 2026, in Annapolis, MD. A complete list of upcoming meetings can be found at https://www.mafmc.org/council-events.

Home
Regulations
Meetings
Fishery Management
News & Updates
About the Council
Habitat and Ecosystem
Best Fishing Practices
Citizen Science Program
Science & SEDAR
Resilient Fisheries
Public Comment

Search

September Council Meeting Advances Measures on Commercial Management and Headboat Limits



September 22, 2026

The South Atlantic Fishery Management Council met September 14-18, 2026, in North Charleston, South Carolina. There were awards, new appointments, and discussions around fisheries management, largely in the Snapper Grouper Committee.

Council Recognizes Law Enforcement and Longtime Service



Trish Murphey (left) and John Carmichael (right) hold the Award of Excellence.

The Council presented Awards of Excellence to both Trish Murphey and Jeff Buckel in recognition of their decades of service to the Council and Scientific and Statistical Committee, respectively. We commend them for their meticulous

work and impactful contributions to fisheries management and science in the South Atlantic. The Council also recognized NOAA Fisheries Office of Law Enforcement Special Agent Kevin Mitchell as the 2025 Law Enforcement Officer of the Year for his work investigating fisheries violations, protecting North Atlantic right whales, and engaging with fishermen and the public.

Resilient Fisheries Initiative



The Council received an extensive update on the Resilient Fisheries Initiative, which supports projects addressing management challenges associated with changing ecosystems. The Council received a presentation from Dr. Sarah Gaichas on the completed Ecosystem Information Review Project, which examined how regional fishery management councils use ecosystem information and identified opportunities to strengthen the use of ecological and socioeconomic indicators in South Atlantic fisheries management. The Council also received updates on collaborative workshops and governance efforts and provided direction for a Governance Workshop to be held in early 2027 in conjunction with the Mid-Atlantic Fishery Management Council and NMFS. The workshop will focus on improving management processes across Council regions, better documenting management and governance processes, and improving coordination among Councils and NMFS.

Commercial Management Measures



The Council continued work on Amendment 60, which is intended to improve long-term stability and profitability in the commercial snapper grouper fishery. The amendment would remove the current “2-for-1” requirement for transferable commercial snapper grouper permits, allow vessels to switch to or from bottom longline gear

during a trip under specified conditions, and adjust trip limits for several species.

The Council reviewed public comments received during the public hearings as well as information on vessel monitoring systems and how gear changes could be communicated to law enforcement. The Council will continue working with the Snapper Grouper Advisory Panel and plans to consider final approval at its December 2026 meeting.

Snapper Grouper Fishery Management Unit Revision



The Snapper Grouper Fishery Management Unit (FMU) currently includes 55 species, many of which are unassessed or have low landings. Through Amendment 61, the Council is considering changes to the composition of the FMU to streamline management. Fourteen species are being evaluated to determine whether they should remain under federal management, be removed from the FMU, or be designated as Ecosystem Component (EC) species. For species considered for EC designation, the Council is exploring ways to maintain some management requirements to support data collection and prevent overexploitation. The Council will continue developing Amendment 61 and plans to consider approving it for public hearings in March 2027.

Headboat Vessel Limits



The Council continued development of Regulatory Amendment 38, which proposes a headboat-specific vessel limit of two gag or black grouper per six passengers. The measure is intended to improve efficiency and profitability for federally permitted headboats by allowing vessel limits to increase with the number of passengers onboard. The Council mostly focused on the criteria vessels would need to meet to qualify for the higher limit and settled on two requirements: a valid federal charter/headboat permit and a valid U.S. Coast Guard Certificate of Inspection (COI). The amendment also proposes updating golden

tilefish catch levels based on the latest stock assessment. Public hearings on the headboat vessel limit amendment will be held this fall.

Spawning Special Management Zones



The Council approved Regulatory Amendment 39 for public hearings to consider extending protections in three Spawning Special Management Zones (SSMZs): South Cape Lookout, Georgetown/Devil's Hole, and Warsaw Hole. The three areas currently have a sunset provision that would allow the fishing restrictions to expire in August 2027. The Council is examining options to extend the sunset provision for 10 years, through August 2037, allowing additional time for research and monitoring to evaluate the benefits of these areas for spawning fish and habitat. Public input will be collected through a webinar hearing as the amendment moves forward.

Additional Information

Additional information about the Council's September 2026 meeting, including individual reports from committee meetings and meetings of the Full Council, is available from the Council's website at: https://safmc.net/events/september-2026-council-meeting/. The next meeting of the South Atlantic Fishery Management Council is scheduled for Dec. 7 – Dec. 11, 2026, in Beaufort, NC.

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JOSH STEIN
Governor

D. REID WILSON
Secretary

JONATHAN HOWELL
Director

October 28, 2026

MEMORANDUM

TO: N.C. Marine Fisheries Commission

FROM: Jason Rock, Fisheries Science Section Chief

SUBJECT: Temporary Rule Suspensions

Issue
In accordance with the North Carolina Division of Marine Fisheries Resource Management Policy Number 2014-2, Temporary Rule Suspension, the North Carolina Marine Fisheries Commission will vote on any new rule suspensions that have occurred since the last meeting of the commission.

Findings
There have been no new rule suspensions since the August 2026 meeting.

Action Needed
No action is needed.

Overview
In accordance with policy, the division will report current rule suspensions previously approved by the commission as non-action items. They include:

NCMFC Rule 15A NCAC 03J .0103 (h) GILL NETS, SEINES, IDENTIFICATION, RESTRICTIONS

Suspension of a portion of this rule for an indefinite period. Suspension of this rule allows the division to implement year-round small mesh gill net attendance requirements in certain areas of the Tar-Pamlico and Neuse rivers systems. This action was taken as part of a department initiative to review existing small mesh gill net rules to limit yardage and address attendance requirements in certain areas of the state. This suspension continues in Proclamation M-18-2026.

NCMFC Rule 15A NCAC 03J .0501 (e)(2) DEFINITIONS AND STANDARDS FOR POUND NETS AND POUND NET SETS

Suspension of a portion of this rule for an indefinite period. Suspension of this rule allows the division to increase the minimum mesh size of escape panels for flounder pound nets

in accordance with Amendment 3 of the North Carolina Southern Flounder Fishery Management Plan. This suspension was implemented in proclamation M-34-2015 and continues in Proclamation M-16-2026.

NCMFC Rule 15A NCAC 03L .0103 (a)(1) PROHIBITED NETS, MESH LENGTHS AND AREAS

Suspension of a portion of this rule for an indefinite period. Suspension of this rule allows the division to adjust trawl net minimum mesh size requirements in accordance with Amendment 2 to the North Carolina Shrimp Fishery Management Plan. This suspension was implemented in Proclamation SH-3-2019 and continues in Proclamation SH-1-2022.

NCMFC Rule 15A NCAC 03L .0105 (2) RECREATIONAL SHRIMP LIMITS

Suspension of a portion of this rule for an indefinite period. Suspension of this rule allows the division to modify the recreational possession limit of shrimp by removing the four quarts heads on and two and a half quarts heads off prohibition from waters closed to shrimping in accordance with Amendment 2 to the North Carolina Shrimp Fishery Management Plan. This suspension was implemented in Proclamation SH-4-2022.

NCMFC Rule 15A NCAC 03L .0205 (a) CRAB SPAWNING SANCTUARIES

Suspension of a portion of this rule for an indefinite period. Suspension of this rule allows the division to close crab spawning sanctuaries year-round to the use of trawls in accordance with Amendment 2 to the North Carolina Shrimp Fishery Management Plan. This suspension was implemented in Proclamation M-13-2024.

NCMFC Rule 15A NCAC 03M .0502 (a) MULLET

Suspension of a portion of this rule for an indefinite period. Suspension of this rule allows the division to modify the recreational and for-hire possession limits of mullet in accordance with Amendment 2 to the North Carolina Striped Mullet Fishery Management Plan. This suspension was implemented in Proclamation FF-27-2024.

NCMFC Rule 15A NCAC 03M .0515 (a)(2) DOLPHIN

Suspension of a portion of this rule for an indefinite period. Suspension of this rule allows the division to adjust the recreational vessel limit to complement management of dolphin under the South Atlantic Fishery Management Council's Amendment 10 to the Fishery Management Plan for the Dolphin and Wahoo Fishery of the Atlantic. This suspension was implemented in Proclamation FF-30-2022.

NCMFC Rule 15A NCAC 03Q .0107 (4) SPECIAL REGULATIONS: JOINT WATERS

Suspension of a portion of this rule for an indefinite period. Suspension of this rule allows the division to adjust the creel limit for American shad under the management framework

of the North Carolina American Shad Sustainable Fishery Plan. This suspension was continued in Proclamation FF-8-2026.

JOSH STEIN
Governor

D. REID WILSON
Secretary

JONATHAN HOWELL
Director

November 2, 2026

MEMORANDUM

TO: N.C. Marine Fisheries Commission

FROM: Brandi Salmon, License and Statistics Section Chief

SUBJECT: Latest Version of License and Statistics E-Big Book Available

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The License and Statistics E-Big Book continues to be available to the public using this link: https://nc-dmf-bigbook.share.connect.posit.cloud/. The latest version contains updated commercial and recreational dependent data through calendar year 2025 and commercial and recreational license data through fiscal year 2026 (July 2025 – June 2026). Staff continue to accept recommendations on ways to summarize and display License and Statistics Section data for future versions.

In addition to the E-Big Book, the public can access recreational dependent data collected through the Marine Recreational Information Program's (MRIP) Query Tool using this link: https://www.fisheries.noaa.gov/data-tools/recreational-fisheries-statistics-queries. The data supplied in the E-Big Book and the MRIP Query Tool contain backdated estimates using the most recent Fishing Effort Survey recalibrated numbers. Due to this adjustment, there may be discrepancies between the data found in the current version of the E-Big Book and data found in prior publications, such as stock assessments, Fishery Management Plans, prior data requests, etc. More information about these changes can be found here: Fishing Effort Survey Research and Improvements | NOAA Fisheries.

NC Marine Fisheries Commission

Fishery Management Plans

November 2026 Quarterly Business Meeting

Documents

FMP Updates Memo

FMP Schedule

FMP Development Tracker

Kingfishes FMP Amendment 1 Decision Document

Kingfishes Written Comments

Kingfishes Scoping Document

JOSH STEIN
Governor

D. REID WILSON
Secretary

JONATHAN HOWELL
Director

November 4, 2026

MEMORANDUM

TO: N.C. Marine Fisheries Commission (MFC)

FROM: Jeffrey Dobbs, FMP Coordinator
Daniel Zapf, FMP Coordinator

SUBJECT: November 2026 FMP development and implementation status update

Status of State FMPs

Out of 13 State Fishery Management Plans (FMPs), the Southern Flounder, Kingfishes, Red Drum, and Blue Crab plans are currently under review. Updates for all 13 plans are provided in the table below.

FMP	Update
FMPs Under Review	
Southern Flounder Scheduled review: 2024	**<u>Amendment 4</u>** The recreational season occurred September 1-14, and the commercial season had various opening and closing dates for different area and gear combinations in accordance with Amendment 4 and quota management. Once landings data are finalized, they will be evaluated to determine if quota overages occurred. **<u>Amendment 5</u>** The MFC chairmen appointed nine members to the Southern Flounder Amendment 5 FMP Advisory Committee (AC), and the FMP AC will be scheduled soon. Following the FMP AC workshop, the Division will incorporate FMP AC input into the second draft of the plan and the MFC will vote to send the draft for public and MFC AC comment.
Red Drum Scheduled review: 2025	A scoping period was held from October 1–30, 2026 to solicit input from the public about stock concerns and management issues and strategies that could be addressed during the FMP review. During this time, the Division hosted four scoping meetings attended by 19 members of the public who provided input on Red Drum management. Additionally, 75 members of the public submitted online comments. The Division is reviewing management and evaluating scoping input and will present a process for completing the FMP review at the February 2027 MFC business meeting.

FMP	Update
Kingfishes Scheduled review: 2025	A scoping period was held from September 1–30, 2026 to solicit input from the public about stock concerns and management issues and strategies that could be addressed during the FMP review. After reviewing current management and considering scoping comments the Division concluded an Amendment to the Kingfishes FMP is necessary to re-evaluate and consider changes to current management strategies. At the November 2026 MFC business meeting, the MFC will vote to approve the goal and objectives for the draft Amendment 1 to the N.C. Kingfishes FMP. Adoption of Amendment 1 is tentatively scheduled to occur in early 2028.
Blue Crab Scheduled review: 2026	Review of the FMP began in July 2026, and a benchmark stock assessment underwent external review by a panel of independent peer reviewers during a workshop held November 3–5, 2026. Once a report is completed by the peer review panel, the Division will review the report and decide whether the assessment is suitable for management use. At the February 2027 MFC business meeting, the Division will present stock assessment results, peer review conclusions, the Division conclusion for whether the stock assessment will be used to inform management, and initial information about the FMP review.
FMPs with Requests Pending	
Bay Scallop Scheduled review: 2026	The Division requested to delay the scheduled plan review one year such that the review would begin in 2027. This request is pending approval by the DEQ Secretary.
River Herring Scheduled review: 2027	The Division requested to transition River Herring management from Amendment 2 to the N.C. River Herring FMP exclusively to the N.C. IJ FMP. This request is pending approval by the DEQ Secretary.
Remaining FMPs	
Shrimp Scheduled review: 2027	**<u>Amendment 2</u>** Rather than address Submerged Aquatic Vegetation (SAV) protection under the Shrimp FMP Amendment 2, the MFC directed the Division to develop more comprehensive management options to protect SAV habitat from all activities under the authority of the MFC, consistent with the Coastal Habitat Protection Plan (CHPP). The draft 2026 CHPP is expected to include a framework for development of MFC rules for protection of habitats, including SAV.
Estuarine Striped Bass Scheduled review: 2027	**<u>Amendment 2</u>** The Division is evaluating data collected during the open harvest season in portions of the Tar-Pamlico and Neuse rivers in 2026 to inform whether the 2027 harvest season will be maintained or reduced.
Interjurisdictional FMP Scheduled review: 2028	No updates

FMP	Update
Striped Mullet Scheduled review: 2029	**Amendment 2** Per the Amendment 2 adaptive management framework requirements, an update to the Striped Mullet stock assessment is tentatively scheduled to begin in 2027.
Spotted Seatrout Scheduled review: 2030	**Amendment 1** Per the Amendment 1 adaptive management framework requirements, an update to the Spotted Seatrout stock assessment is tentatively scheduled to begin in mid-2027. For the second year in a row, the Spotted Seatrout population in N.C. suffered a large-scale cold stun event. When available, data from 2026 will be analyzed to determine the effect of both the 2025 and 2026 cold stuns on the Spotted Seatrout stock in N.C. Results and conclusions will be presented to the MFC when the analysis is complete.
Eastern Oyster Scheduled review: 2030	**Amendment 5** Amendment 5 adopted a new approach for setting season lengths in the cultch supported mechanical harvest fishery based on preseason oyster abundance sampling. Division staff have completed preseason sampling, set the minimum season length for this year, and issued a proclamation to open the fishery.
Hard Clam Scheduled review: 2030	**Amendment 3** The adopted management strategy phases out mechanical clam harvest after the 2027-2028 season. Until then, the mechanical clam harvest fishery will open annually in December and close annually on March 31.

DRAFT FOR DEQ SECRETARIAL REVIEW

DRAFT N.C. FISHERY MANAGEMENT PLAN REVIEW SCHEDULE (July 2026–June 2031) Revised August 1, 2026					
SPECIES (Date of Last Action)	2026–2027	2027–2028	2028–2029	2029–2030	2030–2031
SOUTHERN FLOUNDER (8/25)					
RED DRUM (8/17)					
KINGFISHES (8/20)					
BLUE CRAB (5/23)					
BAY SCALLOP (8/20)^					
SHRIMP (5/24)					
ESTUARINE STRIPED BASS (3/26)					
RIVER HERRING (8/22)=					
INTERJURISDICTIONAL (6/22) -					
STRIPED MULLET (5/24)					
SPOTTED SEATROUT (3/25)					
EASTERN OYSTER (5/25)					
HARD CLAM (5/25)					

^ In 2024 the DEQ Secretary approved the division request to delay the plan review one year to reduce overlap in ongoing plan reviews. **Schedule assumes a follow-up request to the DEQ Secretary is approved to delay one additional year whereby the plan review would begin in 2027. Doing so would align with the comprehensive review of the Shrimp FMP and MFC rule development for protection of habitat within the MFC's authority, consistent with the N.C. Coastal Habitat Protection Plan.**

- In 2024 the DEQ Secretary approved the division request to delay the plan review one year to reduce overlap in ongoing plan reviews.

= The division will be requesting that the DEQ Secretary approve transitioning River Herring management from Amendment 2 to the N.C. River Herring FMP exclusively to the N.C. FMP for Interjurisdictional Fisheries, which adopts, by reference, FMPs approved by the ASMFC or federal councils (e.g., the ASMFC Amendment 2 to the Interstate FMP for Shad and River Herring). If the DEQ Secretary approves this request, the final FMP schedule will not include River Herring

This schedule assumes no rulemaking is required to implement plan amendments.

FMP Development Tracker - November 2026

Fishery Management Plans	Division forms Plan Development Team	Division discuss issues and Goals and Objectives	Hold Scoping Meetings and Scoping Period	Division drafts FMP	Hold FMP Advisory Committee Workshop	Division revises FMP	MFC Approve Draft FMP for Public Review	Public and Committee Review of Plan	MFC Select Preferred Management Options	MFC Final Adoption of FMP
Southern Flounder					TBD					
Red Drum					TBD					
Kingfishes					TBD					
Bay Scallop	Division requesting schedule change from DEQ Secretary									
Blue Crab	Opened July 1, 2026									

Legend

	Step Completed
	Step In-Progress
	Step Upcoming

DECISION DOCUMENT

Kingfishes (Sea Mullet) Fishery Management Plan

Draft Amendment 1



This document was developed to help the MFC track previous activity and prepare for upcoming actions related to the Kingfishes FMP draft Amendment 1.

November 2026

Summary

Three species of Kingfishes occur in North Carolina waters: Southern, Gulf, and Northern. The term Kingfish is used when referring to a specific species, such as Southern Kingfish, while Kingfishes or Kingfishes stock complex refers to the three species collectively. All three species are managed collectively under the North Carolina Kingfishes Fishery Management Plan (FMP). **At the November 2026 Marine Fisheries Commission (MFC) business meeting, Division of Marine Fisheries (DMF) staff will update the MFC with results of the Kingfishes scoping period and the MFC will vote to adopt the draft Amendment 1 goal and objectives. The Division also requests the MFC provide input on other topics or issues to consider during development of draft Amendment 1.**

Background

The scheduled 5-year review of the Kingfishes FMP began in 2025. The 2007 North Carolina Kingfishes FMP established the use of annual trend analysis and triggers to monitor the Kingfishes stock and identify potential management concerns. Results are presented to the MFC as part of the annual FMP Review. Activation of any two triggers two years in a row warrants further evaluation of the data and potential management action. Information Updates to the FMP were completed in 2015 and 2020. In 2015, the best available data and techniques used for the trend analysis and triggers were refined and modified to better assess population trends. In 2020, the annual FMP Review served as the comprehensive 5-year review.

As part of the current FMP review, available data were explored to examine the possibility of conducting a stock assessment for the Kingfishes stock complex in North Carolina waters. However, because the Kingfishes stock complex is transboundary and consists of multiple species with their own unique biological characteristics, the stock assessment was not successful and could not estimate stock status relative to whether the stock is overfished or overfishing is occurring.

However, to further investigate the relative health of the Kingfishes stock complex when they are in North Carolina waters, recreational and commercial landings data, fishery-independent indices, and age and length composition data were explored. Upon reviewing the data, the DMF concluded:

- the data for Kingfishes are limited, but
- the available data is informative of the Kingfishes stock complex, and
- there is no immediate concern for the Kingfishes stock complex based on trends in length and age data and abundance as indicated by available fishery-independent survey data.

Scoping

The scoping period for the Kingfishes FMP occurred from September 1–30, 2026. Two in-person meetings were held, Thursday, September 3, 2026, at the Morehead City Central District Office (CDO) and Thursday, September 17, 2026, at the Wilmington Regional Office (WIRO). The meeting at the CDO was also streamed online and a listening station was available at the Manteo Field Office.

Between the two scoping meetings there were 31 attendees (27 in-person and four online), and seven public comments were provided. Comments specific to Kingfishes and Kingfishes management included:

- Changes in gill net mesh sizes and market factors prevent catching smaller sea mullet because they cannot be sold.

- Recommendation for a 15 fish per person bag limit and an 8" minimum size limit in the recreational fishery.
- Comments about the number of commercial trips going down and Kingfishes landings staying the same, so it is not necessary to change management.
- Not changing anything until there is a biological reason to do so, the stock is not assessed, no immediate concern for the stock, several triggers have become unreliable because of survey changes, and there is no biological evidence to support changing management. Until there is a problem, there should be no management changes.
- Kingfishes have good and bad years and the commercial fishery depends on them.
- Concern about gill nets set close to the beach and the need to enforce existing rules.

Following each scoping meeting DMF staff were available to answer questions and take comments from those who did not wish to speak during the public comment session. Comments provided included:

- Wanting more information about what changes could occur in the small mesh gill net fishery. Not wanting to see any changes in the small mesh gill net fishery.
- Any management changes need to be based on science.
- The Kingfishes commercial fishery differs depending where you are in the state. The northern part of the state tends to land smaller fish than the southern part of the state.
- Commercial regulations on Spot seem to be driving commercial effort for Kingfishes, because Kingfishes are one of the few species the commercial fishery can catch without any harvest limits. If Spot bycatch is excessive (during the closed commercial season for Spot) they would stop trying to fish for Kingfishes.
- Use different gill net mesh sizes depending on where they are fishing, use smaller mesh sizes in Morehead City area than in Wilmington because of differences in fish size, and change the mesh size used throughout the season.
- This is a recreationally dominated fishery.
- Suggestion to manage the three species separately.
- Interest in a 10" minimum size limit and a high recreational bag limit.
- The recreational and commercial fisheries are more concerned with quality (larger fish) over quantity.
- No overall concern for the stock. The fish seem to be available, but the fishery is seasonal.
- When shrimp trawls are working in an area it is harder to catch Kingfishes.
- Interest in knowing harvest and regulations in neighboring states.
- Concern about the distance from shore requirements for anchored gill nets in the ocean and how those rules may not be followed, or how those rules affect catch of Kingfishes.

Online comments were accepted during the scoping period from September 1–30, 2026. During the scoping period, 54 online comments were received: 45 from recreational fishery participants, four from commercial fishery participants, four who identified as participating in the commercial and recreational fisheries, and one who did not specify which fishery they participate in. Online comments specific to Kingfishes included:

- 14 commenters did not want to see management changes.
- 10 commenters indicated there was concern for the stock based on observed declines (less abundance, smaller sized fish).
- 21 commenters indicated support for changing management, and of those who supported management changes
    - 18 supported implementing a bag limit (generally 5–50 fish but most specific bag limit suggestions were for 10–20 fish or 20+ fish).
    - 17 supported implementing minimum size limits (generally 9–10 inches but most specific suggestions were for a 10-inch minimum size limit which aligns with the length at 100% maturity).
    - Two supported closed seasons (March and April to coincide with the beginning of the spawning season and December 16–December 31 to mirror the commercial Atlantic croaker closure).
    - One supported allowing more harvest of Kingfishes from shrimp trawls.
    - One supported changing the minimum gill net mesh size to 2-5/8" and banning overnight gill net soaks.
- 13 commenters noted the need to either account for shrimp trawl discards in management or to further restrict (time, area, etc.) the use of gill nets and shrimp trawls.
- Three commenters noted the need to base decisions on data and/or sound science.
- One commenter noted that restrictions on other species have shifted effort to species like Kingfishes.

FMP Review Next Steps

After reviewing current management and considering scoping comments, an Amendment to the Kingfishes FMP is necessary to update current management strategies and consider changes to current management. Existing management strategies have been in place since 2007 and have not been re-evaluated except for Information Updates completed in 2015 and 2020 that determined management changes were not necessary.

The current management strategy monitors the Kingfishes stock complex annually using trend analysis and triggers. This framework is vague and does not specify which conditions or data trends might indicate the need for management changes or the process by which management changes would be made. In addition, review of the triggers in 2025 concluded most were set too conservatively, survey changes have limited their effectiveness, or survey changes have eliminated the ability to use specific triggers moving forward. Draft Amendment 1 will update the monitoring framework to use the most appropriate and current available scientific information and will include an adaptive management framework outlining a management response when data indicates it is necessary.

Given there are no recreational or commercial (note rule 15A NCAC 03J .0202(5) limits harvest of all finfish from shrimp trawls) restrictions in place directly limiting the harvest of Kingfishes*, and comments received during scoping indicate immediate management changes should be considered, draft Amendment 1 will provide options for immediate management changes that could be implemented independent of the adaptive management framework upon adoption of the plan.

*Rule 15A NCAC 03J .0202(5) states it shall be unlawful to possess finfish incidental to shrimp or crab trawl operations from December 1 through March 31 unless the weight of the combined catch of shrimp and crabs exceeds the weight of finfish, except an additional 300 pounds of Kingfish (*Menticirrhus* spp.) may be taken south of Bogue Inlet.

Background information about Kingfishes life history, trends in the recreational fishery, trends in the commercial fishery, economic impacts, characteristics of the commercial gill net fishery, and landings and discards in the shrimp trawl fishery will also be updated as part of draft Amendment 1.

Draft Amendment 1 Goal and Objectives

Action: At the November 2026 MFC business meeting, the MFC will vote to adopt the goal and objectives for draft Amendment 1 to the North Carolina Kingfishes FMP.

The goal of the N.C. Kingfishes (*Menticirrhus* spp.) Fishery Management Plan is to manage the Kingfishes stock complex in N.C. waters to provide protection for and access to the stock complex using science-based decision-making processes. The following objectives will be used to achieve this goal:

- Develop N.C. specific quantitative analyses to monitor the Kingfishes stock complex in N.C. waters and manage in consideration of available biological, social and economic, fishery, habitat, and environmental data.
- Identify and support research to increase our understanding of biology and population dynamics of the Kingfishes stock complex in N.C. waters.
- Promote outreach to increase public awareness regarding management of the Kingfishes stock complex in N.C. waters and encourage stakeholder involvement in fishery management activities.
- Evaluate and recommend habitat management consistent with the Coastal Habitat Protection Plan (CHPP) regarding critical habitats and environmental quality to promote growth, survival, and reproduction of the Kingfishes stock complex in N.C. waters.

Draft Amendment 1 Timeline

The tentative timeline for development of draft Amendment 1 to the Kingfishes FMP is:

November 2026	MFC approves draft Amendment 1 Goal and Objectives
Winter 2026/Spring 2027	DMF develops first draft of Amendment 1
May/August 2027	DMF meets with FMP Advisory Committee (AC) to revise first draft of Amendment 1
Summer/Fall 2027	DMF develops second draft of Amendment 1 incorporating FMP AC input
August/November 2027	MFC votes to send draft of Amendment 1 for public and AC review
September 2027/January 2028	MFC AC and public review of draft Amendment 1
November 2027/February 2028	MFC selects preferred management options
Winter/Spring 2028	Legislative review of draft Amendment 1
February/May 2028	MFC votes on final adoption of Amendment 1
TBD	DMF implements Amendment 1 management strategies

*Red outline indicates current step

N.C. Marine Fisheries Commission
November 2026 Quarterly Business Meeting

Written public comments submitted online during the September 1 – 30, 2026 scoping period for the N.C. Kingfishes Fishery Management Plan Review

Name	State/Province	Sector	Comment
James Armel	South Carolina	Recreational	The stock is overfished on the OuterBanks.Implement a 10 fish limit and the use of only 2 fishing rods .
Brian Brumbaugh	North Carolina	Recreational	I fish 3-4 days per week on my boat, from Little River to the Shallotte River, and many of the "creeks" in between. I have lived and fished here for 4 years. There are mullet everywhere! School after school after school! Anywhere I fish you see "V's" in the water. This year, I have seen more jumping mullet and many are absolutely huge…sometimes wonder if it's actually a puppy drum!
Kenneth Broadwell	North Carolina	Both	There are already too many restrictions on fish species. Leave Va mullet alone.
Konstantinos Mousios	South Carolina	Recreational	I'm being fishing sea mullets at Topsail the last 35 years at the same spot every fall. Overall the numbers are declining. I wouldn't mind a number limit for recreational fishing BUT the netters are getting more aggressive every year. Fishing very close to surf using clear plastic net and catching 1000's pound of spots and mullets won't help you manage the fish population.
Alan Marlowe	North Carolina	Recreational	Leave it alone. It's the citizens right to harvest fish for consumption. We need to focus on the resource not the industry. I agree with size limits and creel but not seasons. Sea mullet are in abundance where I live so until We have concrete data showing the stock assessment leave it alone. We are tired of having to be educated on when and what we can fish for. Fisheries is out of control.
Marc Boettger	North Carolina	Recreational	North Carolina currently has no minimum size limit for kingfish (southern, gulf, and northern), despite the species being regularly targeted in the surf and nearshore fishery. I recommend the Division/Commission adopt a 9–10 inch total length minimum, which clears published length-at-maturity thresholds for all three species, roughly 7.5" for southern kingfish, 9.1" for gulf kingfish, and 10.1" for northern kingfish, the binding constraint in a combined rule. Because all three species are short-lived (max ages of roughly 4–6 years) and commonly caught around 11–12 inches, this range protects immature fish without meaningfully restricting the existing fishery. A modest 9–10 inch minimum offers low-cost insurance against localized recruitment pressure while remaining biologically grounded and economically minimal in impact. I respectfully urge adoption of this limit as a sound, science-based management step for the kingfish fishery.
Phillip Johnson	North Carolina	Recreational	NO CHANGE!!!! Seamullet are one of the only fish recreational fisherman can still catch enough of to make fishing at the NC coast worth the trip. Believe it or not for some of us it's not only a sport it's a way to feed our families. It is absolutely insane to me how far the DMF has tightened the screw on size limits and daily limits on what we catch and take back home with us. We got to start using some common sense with this mess! How can a recreational fisherman affect the fish populations

Name	State/Province	Sector	Comment
			by fishing with a rod and reel? Commercial fisherman need to go further out to drop their nets. I literally was surf fishing years ago on the cape lookout national seashore for a week. There wasn't one day we didn't see several commercial fisherman (25 different boats) we counted circling the island. We saw dozens upon dozens of puffer fish, spot, pompano, sea mullet, and black drums too small for a recreational fisherman to keep if caught by rod and reel washed up and dead on the shore. Are pinfish going to be next? I would one day in the foreseeable future hope to take my daughter fishing ,but from the looks of things I might have to start surf fishing from South Carolina or Virginia!
Phil Sorrells	North Carolina	Recreational	We need reduced creel limits. Also, we need a size limit like a minimum length ot 10". Stop people from keeping those small ones and let them grow up. If we don't do something, we will continue to see a decline in the reproduction rate. Thank you for the opportunity to comment.
Russ McLamb	North Carolina	Recreational	I believe they're should be a minimum size limit. I see a lot of folks keep small and very small mullets especially pier fishermen. And also some on the surf. I also think there should be a limit of mullet per person similar to the spot regulations. I love to surf fish. And I always throw back the small ones. It's definitely not the case with all people fishing. But I've seen mullet and especially spot numbers decline over the last several years. Not sure if limits would help. I also believe construction for homes and other properties have contributed to the decline as well. Thanks.
Jimmy Powers	North Carolina	Recreational	When I was younger 30 years ago whiting was easier to catch while surf fishing. They like other species of fish need to be managed because of the decline in numbers.
Bryon Schmitt	North Carolina	Recreational	State data does not show concerning declines in kingfish populations. This is more than in needed regulation it is overreach and we shouldn't even be talking about this or further restrictions on the Shrimping industry. This is just another assault driven by extremist groups using political influence and power to destroy coastal economies. If they insist on attacking working families and coastal communities the state and federal government need to end all matching funds and grants and refuse any research or data these groups hold sway over in any way! It's time to end the extremism. They want us all to be eating foreign seafood and pond raised shrimp raised in a pond and fed manure! Stop the madness!
Gregory Whitley	North Carolina	Recreational	The population of these fish has greatly declined all along the NC coast. I assume it is due to commercial trawling and netting and fear that my children will no longer be able to enjoy this natural resource in the near future. Something needs to change.
Charles Freeman	North Carolina	Recreational	THIS COMMITTE IN NC IS A JOKE WE ALL CAN GO TO SC OR VIRGINIA AND FISH AND KEEP FISH .OH YEA AND IF YOU ARE COMMERCIAL FISHERMEN AS LONG AS THEYGREASE YALLS POCKETS ITS OK,,,,,,,,,,,,, NC FISHERIES IS A JOKE
Tyler Tschopp	North Carolina	Recreational	I think we do need a size limit on these. I observe many people keeping sea mullets well under the 10" mark and keeping coolers full. I think limits should align with that of spots and croaker.
Tom Filler	North Carolina	Recreational	Need a minimum size limit along with daily limit. This is the only way to approve the stock.
Cas Prewitt	North Carolina	Recreational	No changes needed on the recreational side. Focus on gill nets and inshore trawlers.

Name	State/Province	Sector	Comment
William Rash	North Carolina	Recreational	Thank you for allowing us to comment. I fish for whiting every fall at OBX. I have noticed a decline in catch numbers and size in the last two years. However that did follow three outstanding years in both size and numbers. I do understand that fish populations go through natural cycles, perhaps it would be wise to put limits on our catch and keep. I think a limit of five fish (any size)/day would be about right. Also limit the commercial netting if that's possible. Thanks again for the opportunity to comment
Nicholas Spivey	North Carolina	Recreational	Yes, the once abundant king fish is in decline, as with many other NC species, based on my anecdotal experience. A stock assessment and viability analysis is appropriate at this stage to determine if catch limits are appropriate and under what circumstances.
Timothy Minch	North Carolina	Recreational	There should be a creel limit and size limit on all fishes. Especially sea mullet and pompano.
Greg Sorrell	North Carolina	Recreational	I have seen a steady decline in the population and ask the commission to protect this resource with limits on creel and size limits.
Kevin Blanton	North Carolina	Recreational	Why don't you include the shrimp trawl bycatch against the commercial landings? They are killing millions of finfish. Yet you make up some number as a mortality rate and hold that against the recreational fishermen. Help me understand why your rules are so one sided.
Bryant Adams	North Carolina	Recreational	I believe a daily limit on sea mullets and a length size would not be a bad thing. As long as it is in reason. A limit of 20 and 12 inches or greater would be fine
Wallace Mcanulty	North Carolina	Recreational	Please include shrimp bycatch numbers in the stock assessment. They are the largest removal of kingfishes from the fishery and it’s not even close
Marklan Meadows	North Carolina	Recreational	I always only keep fish I will use each year. I fish early Spring and late Fall. I only go 2-4 5-day trips a year. I know how many pounds of fish I will eat each 6 months. I keep no more than that. About 8 years ago before the Flounder restrictions went into affect I would take all my trips to Buxton, buy a beach driving permit and fish the point and Harreras inlet. I would target my one Drum a day then the rest of the day go after my limit of Flounder and Sheepshead. I rarely, if ever caught my limit. Once the Flounder restriction went into affect the season to catch them was not the time of year I was taking my trips. That forced me to change my location to Nags Head and no longer had a reason to buy a beach driving permit any longer. I would still get my one Drum a day if I were lucky but I would walk out on the rocks at the Oregon Inlet to catch it. The rest of my time I would target Sheepshead from either the rocks or from the Bonner Bridge Pier. This year you have dropped my limit on Sheepshead head to 5, but the pounds of fish I hope to keep to last me 6 months has not changed. If I get my limit of my one Drum and 5 Sheepshead in a day, it will force me to target new species I usually never would target, like Black Drum and King Fish. My comment about King Fish is you are forcing people to target other species every time you put stricter limits on certain species. Where in my case if I plan to only keep 40 pounds of fillets a year it would be spread out over Founder, Red Drum, Black Drum, and Trout. If I no longer am able to get enough to keep there, it forces me to target, King Fish, Pompano etc. that I normally never fish for.

Name	State/Province	Sector	Comment
Richard Allebach	Pennsylvania	Recreational	I believe you should put a limit on the catch of sea mullet before the stocks are depleted.
William Creech	North Carolina	Recreational	The answer is quite simple. Get those nets out of the water and you will need more Marine Fishery Officers to patrol the water and beaches. It pissess me off to see all of those shrimp boats dragging those nets so close to shore. I could throw one of my long rods and hit them. Why is it that SC has more liberal limits than we do???? Is their board more competent than ours??
Lindy Mcghee	North Carolina	Recreational	request size limits on these fish. also request catch limits
Michael Hayes	North Carolina	Recreational	I catch plenty of them if you know what your doing you can to
Mick Brown	North Carolina	Recreational	There definitely needs to be a size limit and lower creel limit. These fish seem to be less numerous and smaller every year.
Douglas Smith	North Carolina	Recreational	For years we fished with rod and reel without licenses and hassle from government agencies. While there are never enough harvest or kill rules placed upon commercial fishing vessels but the rod and reel is not hurting the population. Ever since a license was required catch limits, size limits, closed seasons and more continue to plague the recreational fishing community. We are sick. Sick of taxation without representation. Marine fisheries board should be disbanded.
John Tollefsrud	North Carolina	Both	I would like to see our estuaries protected. send all trawlers at lease one mile offshore. no excuse for them to be inside.
Stephen Taylor	West Virginia	Recreational	The king fish have been the one fish we can count on catching in numbers with decent quality in both our April and October fishing trips.
James McGlinn	North Carolina	Recreational	In my Fishing off the shore and some of the peers in North Carolina and South Carolina, I have found that the availability of decent size kingfishers has decreased considerably over the last five years or so.
Marc Boettger	North Carolina	Recreational	Shrimp Trawl bycatch should be included in any FMP going forward in NC. The court ruling made it clear that this purposful gap in the data is not sustainable.
Clarence Hilliard	North Carolina	Recreational	STOP INSHORE SHRIMPING AND GILL NETTING and all species of sea creatures will improve. Shrimping or netting should not be allowed within the 3 mile territorial limits.
Dick Gray	North Carolina	Recreational	I love to catch and eat Sea Mullet as do all my friends. I don't want to see the stock wasted so a minimum size limit would be fine. Maybe 9 inches as Sea Mullet do have a lot of meat on them for their size. Maybe 25 per day per person. Thanks, Dick Gray

Name	State/Province	Sector	Comment
Matthew Lewis	North Carolina	Commercial	Please leave the sea mullets alone - there is no shortage. Recreationally they are not a targeted species necessarily but pier, beach, and waterway they are abundant. Why doesn't the DMF go after sharks. Way too many sharks. Take the sharks out and there will be more fish. Everyone knows this in their hearts because it makes sense. Not a whole lot of people fish for high quantities of sea mullets in NC.
William William	North Carolina	Recreational	Never had a problem catching sea mullet. They Seem to be plentiful. However, I would support size and creel limits.
Chris Dionigi	North Carolina	Recreational	Thank you for conducting a scoping session on Kingfish management. It is vitally important that we maintain healthy fish stocks and avoid the overharvest of any particular species. One factor that I would like to see changed is a greater consideration is the impact of invasive species, such as lionfish (Pterois volitans). Lionfish prey on already pressured species such as snapper and grouper and by that place additional pressure on Kingfish when people target them in response to declining fish stocks. Yet, invasive fish provide relatively little recreational or commercial value. In that sense, they represent a “double loss” for our state. I urge you to consider developing a comprehensive coastal and marine invasive species management plan that focuses on preventing the introduction of additional invasive species and limiting the range expansion of species that are already established. Control of existing populations by encouraging the intentional overharvest of invasive fish can also help. I think that you will find that both recreational and commercial fishers willing to help. Species-by-species and place-by-place efforts, while important, are not sufficient on their own. Invasive species management should be integrated into broader plans that coordinate the resources, expertise, and capacities of private, commercial, recreational, local, state, and federal partners. Groups such as the Aquatic Invasive Species Task Force, North American Invasive Species Management Association, and others can help form the necessary partnerships. A coordinated, comprehensive approach would help protect our native fisheries, strengthen the resilience of our coastal ecosystems, and better safeguard the long-term economic and recreational value of our marine resources. Thank you Chris Dionigi Chapel Hill, NC

Name	State/Province	Sector	Comment
Eric Blackburn	North Carolina	Both	I THINK THE FISHERY IS FINE . DUE TOO THE TIME OF YEAR THE FISH ARE HERE WEATHER REGULATES THE FISHERMEN. ITS A VALUABLE CROP FOR FISHERMEN WHOESALERS AND RETAIL MARKETS UP AND DOWN THE EAST COAST . NORMALLY ITS ONLY TO FISH 4 MONTHS OUT OF THE YEAR
Earl Sadler III	North Carolina	Both	I've spent a lifetime on the water as a commercial fisherman, and from what I've seen firsthand, I don't believe there needs to be any major changes to the way sea mullet are currently being managed. The fishery has regulations in place for a reason, and I believe the current management measures are doing their job. We need to be careful about making changes based on the idea that there is a shortage when the fishermen who are actually on the water aren't seeing the same thing. Commercial fishermen see these fish throughout the year. We see when they move, where they move, and how catches can change depending on weather, water temperature, location, and conditions. A change in landings doesn't automatically mean there is a shortage of fish. I'm not against good management. I'm against making unnecessary changes to a fishery that is already being managed responsibly. If the science shows that changes are truly necessary, then I'm willing to listen. But until there is clear evidence that the current management is failing, I don't believe we need additional restrictions or major changes to the sea mullet fishery. We want a healthy sea mullet population just as much as anybody. This is our livelihood, and none of us have an interest in hurting the resource. The best approach is to continue managing the fishery responsibly while listening to the commercial fishermen who are out there every day. In my opinion, the current management should stay in place unless there is solid evidence showing that a change is actually needed.
Travis Benfield	North Carolina	Recreational	To the Division of Marine Fisheries and Marine Fisheries Commission: I am a licensed North Carolina recreational angler submitting comment during the Kingfishes scoping period. I'm writing not just about sea mullet, but about the credibility of DMF's management process itself — because before this Division asks recreational fishermen to trust its judgment on a new species, it needs to answer for how badly it has mismanaged an existing one. On Kingfishes specifically: DMF's own scoping document states plainly that no concerning trends have been identified in the Kingfishes stock, and that no management measures currently limit harvest of the species. Good. I am asking the Division to hold that line. Absent a demonstrated conservation need backed by real stock assessment data, there is no justification for imposing new recreational restrictions on this fishery. If DMF's history with southern flounder is any indication,

Name	State/Province	Sector	Comment
			"we're just gathering input" has a way of turning into permanent, disproportionate restrictions on recreational access within a few years. I want that concern on the record now, before any amendment is drafted. On the pattern DMF needs to break — southern flounder: • Recreational anglers get a single 14-day season (currently Sept. 1–14) with a one-fish-per-person daily bag limit and a 15-inch minimum. • Commercial operations, by contrast, operate under a 50/50 quota split with recreational (as of Amendment 4) and effectively fish flounder nearly year-round across multiple gear types and management areas — mobile gear with 25-fish-per-day trip limits, ocean trawl trips with 12,500–15,000-lb limits, pound net seasons running into fall. • By DMF's own FAQ, the recreational sector has exceeded its allowable catch every year since Amendment 3 took effect — inside a season that's already been cut to two weeks and one fish. That's not evidence of reckless recreational fishermen; it's evidence that the recreational allocation itself is too small to function, no matter how tightly the season is squeezed. • Compare that to South Carolina, which faced the same regional stock decline and responded with a 5-fish-per-person, 10-fish-per-boat daily limit and a 16-inch minimum — enforced year-round, with no season closure at all. South Carolina anglers get five fish, 365 days a year. North Carolina anglers get one fish, 14 days a year. Same fish, same coastline, same conservation problem, wildly different burden on the people who fish for food and recreation rather than profit. That gap is not a rounding error. It's the product of an allocation process that treats recreational access as the easiest lever to pull and commercial harvest as untouchable, regardless of which sector is actually driving overage. What I'm asking DMF to do: 1. On Kingfishes, commit publicly that any future management measures will be proportional to actual, demonstrated stock risk — not adopted preemptively because it's administratively convenient. 2. Use this review, and any future FMP process, to revisit the recreational/commercial allocation formula on southern flounder. A state that manages to keep a fishery open with a 5-fish daily limit year-round should not require its neighbor to run a 14-day, 1-fish season and still miss quota. 3. Be transparent, going forward, about how allocation decisions are actually made between sectors — not just how bag limits and seasons are announced after the fact. Recreational fishermen are not the problem in North Carolina's fisheries. We are consistently asked to absorb the deepest cuts while commercial allocations stay comparatively protected, and then told the numbers didn't work out anyway. I'd like a response addressing how this scoping process will avoid repeating that outcome with Kingfishes. Thank you for considering this comment.
Harry Shepherd	North Carolina	Recreational	I think it's about time. Sea Mullets in my opinion should not be harvested by net or hook during the months of March and April. These fish spawn during this period. So tho help the species survive for

Name	State/Province	Sector	Comment
			generations of other anglers. I'm all in. People over fish them in the spring. There should be a bag limit of 30 per day and 10 inches or more.
John Williams	North Carolina	Recreational	What do you thinknis going to happen when you don't count by-catch from shrimping. There by-catch should count against them
Dwain Mckeithan	North Carolina	Recreational	Believe fisheries department has ruined the opportunity for local recreational fishing. Started with flounder. Need to worry about other issues and keep your hands out of size and limits.
William Harvey	North Carolina	Recreational	It is high time some reasonable limits are put on these fish. People take way more than they need. A 15 fish per day limit is perfectly reasonable, more than you can eat.
Richard Harvey	North Carolina	Recreational	I'd like to see a minimum keeper size and maximum limit of 10 per person. People keep way too many small ones and wonder why they don't catch many bigger.
Frederick Creech	North Carolina	Recreational	I believe there should be a minimum size for keeping this species. 12"+ Also would support a 10 to 15 daily limit. Thanks for wanting to protect this important species
Michael Pruitt	North Carolina	Recreational	We need a size limit and bag limit
Michael Pruitt	North Carolina	Recreational	We need a size limit and bag limit
Lucas Simmons	North Carolina	Commercial	I believe the sea mullet fishery should stay open. There is no shortage of fish. The weather patterns and ocean temps change constantly and affect the migration of sea mullets. With that being said the size and quality of fish along with the population I believe are as healthy as can be
Maurice Mann	North Carolina	Commercial	I think you could do better for commercial fisherman to allow more seamullet.while shrimping.its a waste to throw them back.when your trawling.by keeping them it helps with the fuel prices to help pay for fuel.
Rob Horne	North Carolina	Commercial	I would like to see any closure run concurrently with the croaker closed season..if further restrictions are needled make the minimum size 2 5/8 mesh. Then if further restrictions are needed ban overnight soaks. I believe these measures would definitely help the stock.
Carla Ransdell	North Carolina	Other	Downtown newbern has alot of dead fish washing up!

SCOPING DOCUMENT

KINGFISHES FISHERY MANAGEMENT PLAN

Scoping Period: September 1 – September 30, 2026



SCAN TO SUBMIT ONLINE COMMENTS

North Carolina Department of Environmental Quality
North Carolina Division of Marine Fisheries
3441 Arendell Street
P.O. Box 769
Morehead City, NC 28557

SCOPING DOCUMENT

KINGFISHES LEADS

For questions about Kingfishes biology, life history, and management, please contact:

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SCAN TO SUBMIT ONLINE COMMENTS

SCAN TO VIEW KINGFISHES SCOPING INFORMATION AND PRESENTATION

SCOPING DOCUMENT

Important terms to know as you review this scoping document:

Three species of Kingfishes occur in North Carolina waters: Southern, Gulf and Northern. The term **Kingfish** is used when referring to a specific species, such as Southern Kingfish, while **Kingfishes** or **Kingfishes stock complex** refers to the three species collectively. Kingfishes are relatively small, fast-growing, coastal species that mature around age 1 or 2 (about 8 ¼ inches). In North Carolina the maximum observed age is 7 with most fish ranging from 0 to 4 years of age. Most fish caught are generally less than 14 inches long. All three species are managed collectively under the **Kingfishes Fishery Management Plan (FMP)**.

The Kingfishes have several regional names including sea mullet, king whiting, king croaker, sea mink, roundhead, hard head, whiting, hake, Carolina whiting, and Virginia Mullet.

Stock – Population of fish that live in same geographic area and mix enough to spawn when mature.

Stock Assessment - Biological and statistical information on a fish population to determine changes in stock abundance over time. Determines stock status.

Overfishing – Removing too many fish each year.

Overfished – Population is too small.

Fishery Management Plan (FMP) – Document that guides management of a fishery to ensure long-term sustainability.

- Management strategies and management measures enacted under an FMP are done through **Amendments**, **Supplements**, or **Revisions** dependent on the issue being addressed. Management can be implemented to address changes in stock status, new scientific information, or changing stakeholder needs.
- An **Information Update** incorporates changes in factual and background data that do not alter management strategies or management measures and does not introduce or address new management issues.

Management Strategy – Adopted to help reach the goal and objectives of the plan. They are the sum of all the management measures selected to achieve the biological, ecological, economic, and social objectives of the fishery.

Management Measure – The actions implemented to help control the fishery as stipulated in the management strategies.

Adaptive Management – A structured decision-making process when uncertainty exists, with the objective of reducing uncertainty through time with monitoring. Provides flexibility to incorporate new information and accommodate alternative and/or additional actions.

SCOPING DOCUMENT

The North Carolina Division of Marine Fisheries (DMF) wants your input on review of the Kingfishes FMP

PURPOSE OF SCOPING

The scheduled 5-year review of the Kingfishes FMP began in 2025. Upon reviewing internal and external data, the **DMF has not identified any concerning trends in the Kingfishes stock based on available information,** but acknowledges data are limited.

The scoping period provides the public with an opportunity to provide input about stock and fishery issues and the potential need for management changes.

This document provides background information about Kingfishes management and identifies potential issues and management strategies to be addressed. Scoping is the first and best opportunity to make suggestions about what management strategies should or should not be considered during review of the Kingfishes FMP.

Specific management options have not been developed. After reviewing public comments received during the scoping process, the DMF will recommend whether to pursue an **Information Update**, where no management changes are made, or an **Amendment**, where management changes are proposed for adoption by the Marine Fisheries Commission (MFC).

Questions about the Kingfishes fisheries and stock are provided at the end of this document for the public to consider; in general: “What do “viable” Kingfishes fisheries look like to you? What aspects of the Kingfishes fisheries are most important to you? Do you have concerns about the status of the Kingfishes stock? Would you make any changes to Kingfishes management?”

The suggested questions in this document are **NOT** intended to limit the scope of ideas or comments but may provide guidance to organize your thoughts. **The DMF wants to hear about your experiences in the Kingfishes fisheries and how YOU would approach management.**

WHAT IS SCOPING?

Scoping is the first stage of the FMP process. Scoping serves to:

1. Provide notice to the public that a formal review of the FMP is underway.
2. Inform the public of the stock status, when available.
3. Solicit input on relevant management strategies and issues to be addressed.
4. Recruit FMP Advisory Committee (AC) members to assist the DMF in drafting the plan.

SCOPING PERIOD

September 1, 2026 – September 30, 2026

SCOPING DOCUMENT

SCOPING MEETINGS

DMF will hold two scoping meetings (dates, times, and locations in table below), one of which will also provide the opportunity for online participation. At each scoping meeting, DMF staff will be available to provide information, answer questions, and solicit feedback about Kingfishes science, data collection, and management in North Carolina. There will be a presentation followed by a formal comment session. Following the comment session, DMF staff will be available for participants to further discuss issues and attendees are encouraged to communicate and share ideas with DMF staff.

Thursday September 3, 2026 6 p.m. to 8 p.m. DMF Central District Office 5285 Highway 70 West Morehead City, NC 28557 The meeting will also be streamed online A listening station will be available at the Manteo Field Office 1021 Driftwood Drive Manteo, NC 27954	**Thursday September 17, 2026** 6 p.m. to 8 p.m. Wilmington Regional Office 127 Cardinal Drive Extension Wilmington, NC 28405

HOW TO COMMENT

During the comment period, the public may provide comments in person at the public scoping meetings or in writing. Written comments may also be submitted online or through U.S. Mail. All written comments must be received or postmarked by 11:59 pm on Wednesday September 30, 2026. You may submit written comments through one of the following methods:

1. Online at: Kingfishes Scoping Comments
2. U.S. Mail to:

N.C. Division of Marine Fisheries
Kingfishes Scoping
P.O. Box 769
Morehead City, N.C. 28557

All comments, regardless of submission method, will be considered by the DMF during FMP review.

CURRENT MANAGEMENT

Kingfishes in North Carolina are managed under the Kingfishes Fishery Management Plan. The FMP developed management strategies to ensure long-term sustainable harvest for the recreational and commercial Kingfishes fisheries in North Carolina. The plan established the use of annual trend analysis and triggers to monitor the viability of the stock and identify potential management concerns. Results are presented to the MFC as part of the annual FMP Review. Activation of any two triggers two years in a row warrants further evaluation of the data and potential management action.

The FMP did not implement any management measures to directly limit the recreational or commercial harvest of Kingfishes. The only rule that directly refers to Kingfish is 15A NCAC 03J .0202(5) which states it shall be unlawful to possess finfish incidental to shrimp or crab trawl operations from December 1 through March 31 unless the weight of the combined catch of shrimp and crabs exceeds the weight of finfish, except an additional 300 pounds of Kingfish (*Menticirrhus* spp.) may be taken south of Bogue Inlet. Otherwise, **there are currently no size, bag, or trip limits for Kingfishes and there is no closed season.**

Information Updates to the FMP were completed in 2015 and 2020. In 2015, the best available data and techniques used for the trend analysis and triggers were refined and modified to better assess population trends. In 2020, the annual FMP Review served as the comprehensive 5-year FMP review.

STOCK STATUS

As part of this comprehensive FMP review, available data were explored to examine the possibility of conducting a stock assessment for the Kingfishes stock complex in N.C. waters. However, because the Kingfishes stock complex is transboundary and consists of multiple species with their own unique biological characteristics, the stock assessment was not successful and could not estimate **stock status** relative to whether the **stock** is **overfished** or **overfishing** is occurring.

However, to further investigate the relative health of the Kingfishes stock complex when they are in N.C. waters, recreational and commercial landings data, fishery-independent indices, and age and length composition data were explored. Upon reviewing the data, the DMF concluded:

- Data for Kingfishes are limited, but
- The available data is informative of the Kingfishes stock complex
- **There is no immediate concern for the Kingfishes stock complex**

Results of the data review and the scoping period will inform how the FMP review will proceed.

RECREATIONAL FISHERIES

Most recreational harvest of Kingfishes come from the nearshore ocean and anglers fishing from structures like piers, jetties, or bridges but also from surf fishing. A smaller number are captured from vessels in the ocean and in estuarine waters. Recreational harvest is seasonal with most fish harvested during the spring and fall, and the lowest harvest during the summer. Harvest was generally low in the 1980s but has been increasing since the early 2000s (Figure 1). Since 2009, recreational fisheries have harvested around 2.0 million pounds per year or more with some variability across years. Around 6.0 million pounds harvested in 2021 and over 3.0 million pounds harvested in 2022.

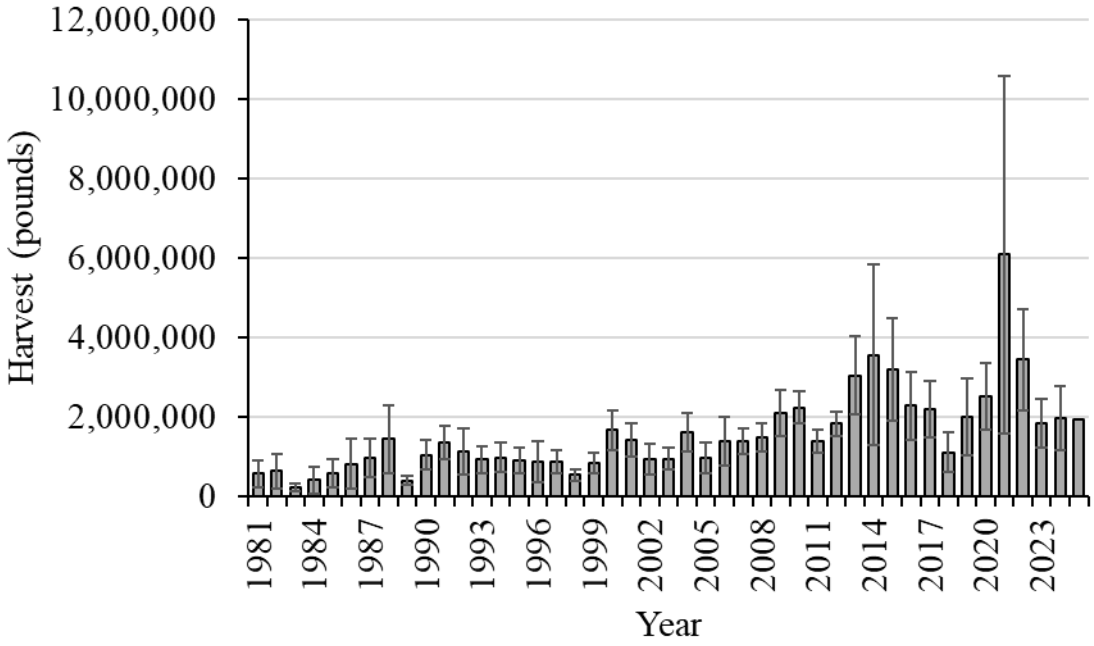


Figure 1. Estimated pounds of Kingfishes harvested in the North Carolina recreational fishery by year, 1981–2025. The lines through each bar indicate the 95% confidence interval for the harvest estimate. Data Source: Marine Recreational Information Program.

COMMERCIAL FISHERIES

Most commercial landings occur south of Cape Hatteras in nearshore (less than three nautical miles) ocean waters. Kingfishes are predominantly landed in the spring and fall corresponding with seasonal inshore and offshore movement. Most commercial landings come from ocean gill nets with lesser amounts landed from trawls, estuarine gill nets, and long haul seines.

Commercial landings ranged from roughly 200,000 pounds to 1.2 million pounds per year from 1981 through 2025 (Figure 2). The number of commercial trips (Figure 3) landing Kingfishes and the number of participants (Figure 4) in the commercial Kingfishes fisheries have declined since 1994.

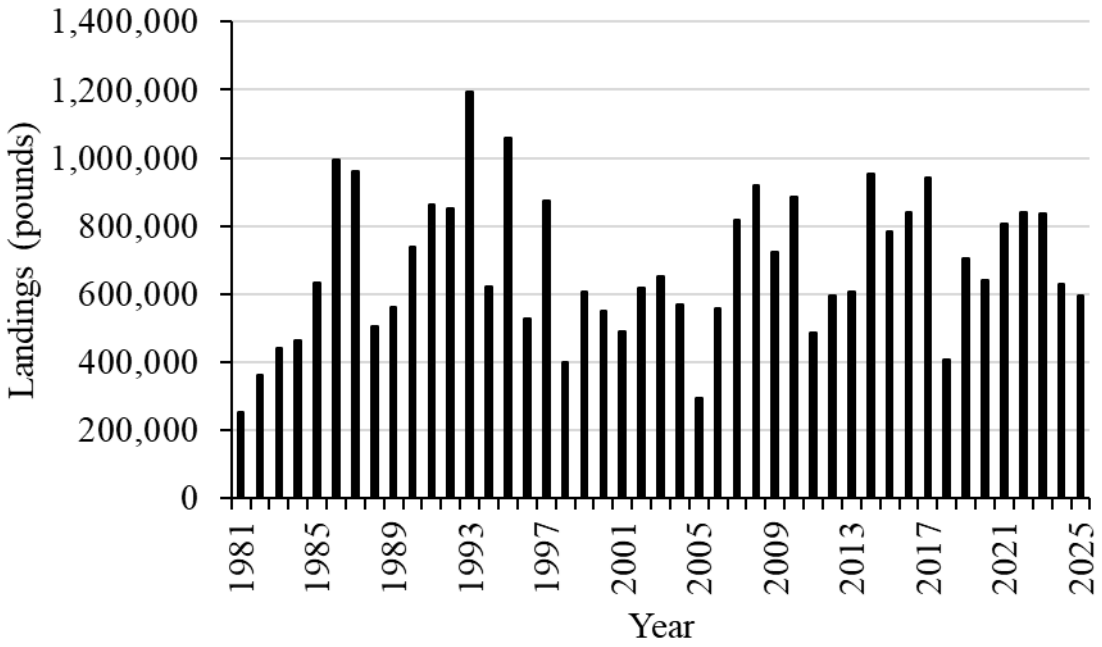


Figure 2. Pounds of Kingfishes harvested in the North Carolina commercial fishery by year, 1981–2025. Data Source: N.C. Trip Ticket Program.

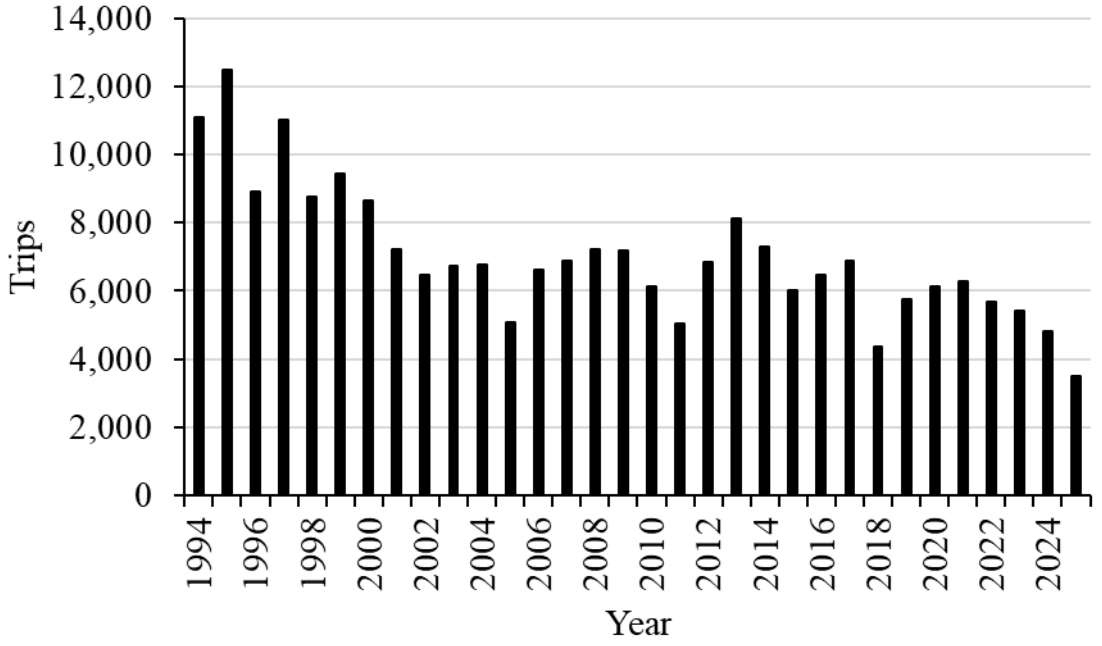


Figure 3. Number of commercial fishing trips landing Kingfishes in North Carolina by year, 1994–2025. Data Source: N.C. Trip Ticket Program.

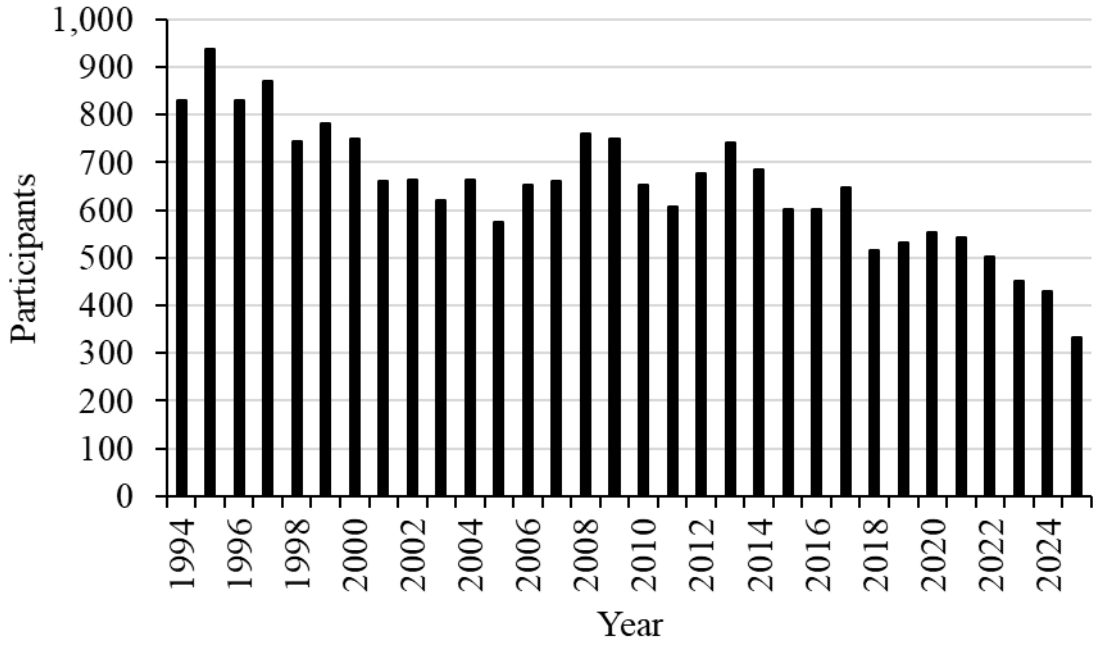


Figure 4. Number of commercial fishery participants reporting Kingfishes landings, 1994–2025. Data Source: N.C. Trip Ticket Program.

STRATEGIES FOR CONSIDERATION

The DMF is in the early exploratory stages of FMP development. **Specific management options have not been developed, and nothing has been proposed**. After reviewing public comments received during the scoping process, the DMF will recommend whether to pursue an **Information Update**, as was done in 2015 and 2020 when no management changes are made, or an **Amendment**, where management changes are proposed for adoption by the MFC.

Prior to determining how to proceed with the current FMP review, the DMF is looking for public input regarding perceptions of the Kingfishes stock and fisheries.

Proactive Management

While the DMF has not identified immediate concern for the Kingfishes stock complex based on available data, because there are no management measures in place to directly limit harvest of Kingfishes, shifts in effort that substantially increase harvest could cause concern. Proactive management that maintains the Kingfishes stock complex at the current level could be considered during this FMP review. This could involve adopting “guardrail” management based on current fishery characteristics and Kingfishes life history such as minimum size limits (consistent with the length at which Kingfishes are able to spawn), or bag/trip limits.

Monitoring Framework

The current framework monitors the Kingfishes stock complex annually using triggers. This framework is not specific as to what conditions or data trends might indicate the need for

additional management. In addition, review of the triggers in 2025 concluded most were set too conservatively, survey changes have limited their effectiveness, or survey changes have eliminated the ability to use specific triggers moving forward. **At a minimum this FMP review will update the current triggers through an Information Update to include the most informative data to represent the status of the Kingfishes stock complex,** like what was done in 2015.

The 2026 FMP review could re-evaluate the response to triggers being exceeded through an amendment. The response could be made prescriptive, where triggers being exceeded would result in specific management changes being implemented (e.g., size or bag limits, etc.).

Small Mesh Gill Nets

At their August 2021 business meeting, the MFC passed a motion to not initiate rulemaking on small mesh gill nets (< 5 inches stretched mesh) but refer the issue through the FMP process for each species. The DMF is interested in public input about fishing practices in the commercial gill net fishery and ideas about how to best manage the Kingfishes small mesh gill net fishery. The DMF is also interested in how implementation of potential management (e.g., minimum size limit, minimum mesh size, or trip limits) would impact fishing operations.

Questions for the Public

The questions below are provided for the public to consider when thinking about the Kingfishes fisheries; in general: “What aspects of the Kingfishes fisheries are most important to you? Would you make any changes to Kingfishes management to improve your experience in the fisheries?”

The suggested questions in this document are **NOT** intended to limit the scope of ideas or comments but may provide guidance to organize your thoughts.

- **What do “viable” Kingfishes fisheries mean to you?**
- **How do you view the future of the Kingfishes fisheries?**
- **As regulations have limited harvest of other fish, do you fish for Kingfishes more often?**
- **What aspects of the Kingfishes fisheries are important to you? For example, do you fish for Kingfishes because they are easily accessible? Do you fish for Kingfishes to keep a lot of fish? Do you prefer keeping larger Kingfishes or do you like keeping all sizes?**
- **How often do you fish for Kingfishes? Where, when, and how do you fish for Kingfishes?**
- **What time of year is targeting Kingfishes most important to you?**
- **In the recreational fishery, how often do you practice catch and release of Kingfishes? What size Kingfishes do you prefer to keep? Do you ever use Kingfishes as bait?**
- **In the commercial fishery, what challenges do you face to operate sustainably and effectively? Have your fishing methods changed to harvest Kingfishes? How have they changed?**

NC Marine Fisheries Commission

Coastal Habitat Protection Plan

November 2026 Quarterly Business Meeting

Documents

Coastal Habitat Protection Plan
2026 Amendment Draft

Executive Summary

2026 Recommended Actions

Ecosystem Assessment and
Report Card

Strategic Habitat Areas Validation

Thin Layer Placement

Submerged Aquatic Vegetation

Coastal Habitat Protection Plan 2026 Amendment

Executive summary

Introduction

The state of North Carolina contains the largest estuarine system of any coastal state on the eastern seaboard, comprised of over 2.9 million acres of estuarine and coastal waters and 12,000 miles of estuarine shoreline, containing diverse habitats that are vital for sustaining the state's economically and ecologically important fisheries and resilient coastal communities. However, these habitats and the species they support are increasingly facing degradation and loss from a multitude of ongoing and cumulative anthropogenic impacts. The Coastal Habitat Protection Plan (CHPP) originates in the Fisheries Reform Act of 1997 (FRA; G.S. 143B-279.8), which requires the Marine Fisheries Commission, Coastal Resources Commission, and Environmental Management Commission to adopt and implement the plan through coordinated management. The CHPP serves as plan to 1) describe and classify biological systems in the habitats, 2) evaluate the function, value to fisheries, status, and trends of habitats, 3) identify existing and potential threats to the habitats and the impact on coastal fishing, and 4) recommend actions to protect and restore habitats.

The CHPP is developed and implemented by NCDEQ staff with expertise in marine fisheries, coastal development, and water quality issues. Updated every five years, previous CHPPs were released in 2005, 2010, 2016, and 2021. The 2021 CHPP served as an amendment to the 2016 CHPP (sometimes referred to as the "source document"), and this CHPP also serves as an amendment to the 2016 CHPP. Increasing water quality degradation, habitat loss, and climate change continued to build pressure on coastal habitats and the fisheries that depend on them. Accordingly, this CHPP aims to build upon recommendations from the 2021 CHPP to address salt marsh loss and resilience, submerged aquatic vegetation (SAV) habitat loss and restoration, strategic habitat area validation, and ecosystem-based management for coastal habitats.

The status and trends of North Carolina's coastal ecosystems: ecosystem indicator metrics and a statewide coastal ecosystem report card

An understanding of the status of NC's coastal habitats is needed to assess and address the drivers of long-term habitat change and the cascading effects on the fish, shellfish, and crustaceans dependent on them. Since acquiring substantial resources remains a barrier to establishing comprehensive long-term monitoring for a suite of indicators for each

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habitat, DEQ must explore alternative approaches such as an ecosystem level evaluation. This chapter identifies ecosystem report cards as a stakeholder driven assessment and communication tool to evaluate the ecological, social, and/or economic aspects of North Carolina's coastal ecosystems. DEQ will co-design a framework for the report card with a stakeholder workgroup, and scientists and managers will select metrics to best reflect the ecosystems and distill trends into easy-to-understand grades (A, B, C, D, F). The completed ecosystem report card will provide a simple, accessible way for the public and decision makers to understand the current ecosystem status and how it has changed over time.

Strategic Habitat Area validation and implementation plan development

Through previous CHPPs, DMF used a conservation planning tool that incorporated spatial analysis and subject matter expert input to identify a network of high-quality habitat areas in coastal watersheds, referred to as Strategic Habitat Areas (SHAs). SHA nominations for the four CHPP regions were completed in 2017, and field sampling was conducted in two regions (Regions 3 and 4) to verify that the habitat condition and biological productivity of nominated areas were high. Results from the field survey validate that nominated areas support a higher abundance of diverse fish populations. In combination with findings that Strategic Habitat Areas have a more diverse estuarine landscape, a higher area of structured habitats, and less alteration than areas outside of SHAs, the results of this validation study further support the designation of the nominated Strategic Habitat Areas. These results will be combined with additional analysis of DMF independent sampling data in a future issue paper that presents validation of Strategic Habitat Areas statewide and proposes designation options to the Marine Fisheries Commission. Strategic Habitat Area management options will then be developed through stakeholder engagement and collaboration with state, federal, and private partners and presented in another issue paper to rulemaking commissions and external partners.

Thin Layer Placement

North Carolina has approximately 235,000 acres of estuarine wetlands in its coastal waters, which provide essential nursery habitat for fish species, foraging and nesting sites for shorebirds and small mammals, shoreline stabilization and erosion control, and enhance water quality through nutrient and pollutant retention. However, those estuarine wetlands are increasingly threatened by sea level rise, saltwater intrusion, and erosion, and the 2021 CHPP called for expanding collaborations between state, federal, and private partners to protect and restore impacted wetlands through nature-based solutions. This CHPP builds on those 2021 CHPP recommendations by outlining the benefits, resource impacts, and policy and permitting concerns with thin-layer placement, which is a restoration, enhancement, and resilience strategy broadly defined as the application of

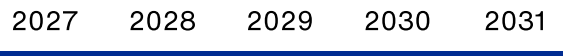
sediments (primarily dredged material) to coastal wetlands in order to increase elevation and surface area, promote sediment accretion, and restore impaired habitat. During development of this CHPP, DEQ staff hosted a workshop to discuss thin layer placement and to share successes, challenges, concerns, and lessons learned associated with the ecological impacts of placing sediment on deteriorating wetlands, and feedback from staff attending the workshop was incorporated into this chapter of the CHPP. The information and guidance summarized in this chapter will serve as an additional resource for regulatory and resource agency staff, commission members, restoration practitioners, and researchers as additional thin layer placement projects are proposed in North Carolina.

Submerged aquatic vegetation protection and restoration

North Carolina's coastal waters have historically supported nearly 200,000 acres of submerged aquatic vegetation (SAV), which provides critical spawning, foraging, and nursery habitat for most of North Carolina's fisheries, and provides additional ecosystem services including carbon sequestration, nutrient filtering, and sediment stabilization. However, degraded water clarity, sea level rise, and rising temperatures represent growing threats to SAV across the state, with rates of habitat loss currently exceeding 1% per year, plus increasing conversion of continuous meadows to patchy SAV beds. The 2021 CHPP set a statewide goal of ensuring a SAV extent of 191,155 acres and recommended new and updated water quality standards to ensure adequate light penetration to allow SAV to regrow in areas where poor water clarity has led to its loss. To ensure progress on slowing the rate of SAV loss across the coast, this CHPP highlights the need to continue to advance a water clarity standard to protect SAV, outlines an approach for a habitat-based rulemaking framework for the MFC to implement additional SAV protections, and summarizes the regulatory framework and ecological and practical concerns for future seed- and transplant-based SAV restoration projects.

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2026 Recommended Actions



Applying the Integrated Ecosystem Assessment approach to assess the status and trends of coastal habitats

- Establish internal working group to establish goals of an ecosystem assessment and state ecosystem report card.
- Conduct workshop with stakeholders, scientists and managers to select ecosystem indicators and establish appropriate thresholds.
- Calculate scores and create a state report card that is easily accessible to a wide audience.
- Communicate status and trends of coastal ecosystems to stakeholders, decisionmakers, and the public.

Strategic Habitat Area validation and implementation

- Explore feasibility of using DMF independent sampling data to validate SHAs for Albemarle Sound and Pamlico Sound regions
- Develop issue paper that presents validation of Strategic Habitat Areas statewide and propose designation options to the MFC
- Establish internal working group to develop management options for Strategic Habitat Areas.
- Conduct a workshop with state partners to further establish potential management strategies.
- Complete a SHA management issue paper and present management options to the appropriate commissions and external partners.

Submerged aquatic vegetation protection and restoration

- Prioritize progress on the recommended actions from the 2021 CHPP amendment to improve water quality for SAV, especially by collaborating to facilitate the passage and implementation of a water clarity standard to protect SAV.
- Initiate formal MFC rulemaking process to develop a CHPP habitat-based rule framework
- Work group to explore barriers to on-the-ground SAV restoration and identify research needs

Thin layer placement (TLP)

- Create a state-wide multi-agency workgroup to progress TLP to facilitate establishment of best practices for TLP specific to North Carolina.
- Evaluate the status and trends of wetlands across coastal North Carolina, incorporating high-resolution land cover data obtained through the 2021 CHPP.
- Leverage existing tools and data sources to identify candidate areas that may benefit most from TLP.

The status and trends of North Carolina coastal ecosystems: ecosystem indicator metrics and a statewide coastal ecosystem report card

Executive summary

An understanding of the status of NC's coastal habitats is needed to assess and address the drivers of long-term habitat change and the cascading effects on the fish, shellfish, and crustaceans dependent on them. Since acquiring substantial resources remains a barrier to establishing comprehensive long-term monitoring for a suite of indicators for each habitat, DEQ must explore alternative approaches such as an ecosystem level evaluation. This chapter identifies ecosystem report cards as a stakeholder driven assessment and communication tool to evaluate the ecological, social, and/or economic aspects of North Carolina's coastal ecosystems. DEQ will co-design a framework for the report card with a stakeholder workgroup, and scientists and managers will select metrics to best reflect the ecosystems and distill trends into easy-to-understand grades (A, B, C, D, F). The completed ecosystem report card will provide a simple, accessible way for the public and decision makers to understand the current ecosystem status and how it has changed over time.

Introduction

An understanding of the status of NC's coastal habitats is needed to assess and address the drivers of long-term habitat change and the cascading effects on the fish, shellfish, and crustaceans dependent on them. To accomplish this goal, long-term monitoring of each coastal habitat (water column, shell bottom, SAV, wetlands, soft bottom, and hard bottom) needs to occur at appropriate spatial scales and regular intervals.

While there is a range of active long-term programs to monitor fish and water quality, programs that monitor habitat area and function are limited or absent due to the lack of funding for long-term data collection not directly related to agency regulatory compliance. The 2021 CHPP Amendment called to expand mapping and monitoring programs across all habitats to enable formal assessment of ecological indicators (2021 CHPP Recommended Action 8.6), but limited progress has been made to expand in coverage or frequency, let alone establish new monitoring.

Current habitat and water quality monitoring programs

The following sections describe the status of active long-term monitoring programs for coastal water quality and habitats in North Carolina. For historical mapping and monitoring information, please see *Chapter 8. Coastal habitat mapping and monitoring to assess status and trends* in the 2021 CHPP. Complete descriptions, distribution, ecological

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function, and threats of the six coastal habitats can be found in the 2016 CHPP source document.

Water column

The water column habitat includes all water covering a submerged surface and is the medium that connects all aquatic habitats and associated fauna. The water quality describes the condition of water based on the physical, chemical, and biological characteristics, usually with respect to its suitability for a particular purpose such as drinking, recreation, or supporting aquatic life. While there are multiple programs that measure water quality data in the state, there is not sufficient spatial or temporal coverage within CHPP boundaries.

The NC Ambient Monitoring System (AMS), conducted by NC Division of Water Resources across the entire state, is the most comprehensive long-term, continuous water quality monitoring program along NC's coast. There are 149 active monitoring stations within the CHPP boundaries. However, stations are concentrated mostly in riverine and upper estuarine waters, with some large spatial gaps existing along the coast (2021 CHPP Chapter 8). Water temperature, specific conductance, pH, turbidity, total suspended solids (TSS), dissolved oxygen (DO), and fecal coliform are monitored monthly at each site. Some sites receive specific additional measurements based on stream classification, discharge types, and historical/suspected issues, which can include salinity, water clarity, flow, nutrients (NH3, NO2+NO3, TKN, TP), fluoride, sulfate, total hardness, color, oil and grease, and chlorophyll a. The 2021 CHPP (Recommended Action 8.3) called for DWR to evaluate and prioritize estuarine ambient monitoring system sites by 2023, but there was no capacity to address gaps in the spatial, habitat, or parameter coverage.

DEQ also tracks the occurrence of fish kills and algal blooms. Algal blooms occur when specific environmental conditions in the water column are met (e.g., increased nutrient concentrations, high water temperature, prolonged solar radiation, stagnant water flows). Algae rapidly grow or "bloom" and some can contain toxic compounds for fauna and humans. Additionally, as they decompose, large areas of low dissolved oxygen or high pH can occur. In addition to public health concerns, if fish cannot seek refuge from hypoxic events, large schools can die and result in a fish kill. Outreach to the public occurs each year as algal blooms and fish kills are reported to DEQ. DWR staff investigates some public sightings, but not all events are formally investigated.

Since 1925, the DMF Shellfish Sanitation Program has collected water quality data to assess suitability for harvesting shellfish in 968 shellfish growing areas. A detailed shoreline survey is conducted every three years to identify confirmed and potential pollution sources to determine their potential impact on shellfish growing waters and

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public health. These detailed surveys involve visits to properties throughout each Growing Area watershed, where potential sources of pollution such as marinas, on-site wastewater systems, agricultural areas, wastewater treatment plants, and stormwater drainage systems are all evaluated for their potential impacts on surrounding water quality. Fecal coliform bacteria, an indicator for human or animal waste, is measured a minimum of six times a year and used with the identified potential pollution sources to classify if the area is open to shellfish harvest. The salinity, temperature, tide, and weather conditions are also measured at sampling stations.

The Recreational Water Quality Program is another DMF program that has tested water quality since 1997 to protect public health by notifying the public when bacteriological standards for safe bodily contact are exceeded. The program tests water at 204 swimming sites during the April through September swimming season, with additional sites tested by NGOs (e.g., Sound Rivers weekly Swim Guide). This program measures Enterococcus bacteria, an indicator organism found in the intestines of mammals, and standard water quality parameters. The salinity, temperature, tide, and weather conditions are also measured at sampling stations.

All DMF independent sampling programs collect abiotic water quality parameters such as temperature, salinity, DO, depth, and Secchi depth, which have been used to look at long-term trends interpolated across waterbodies. For instance, the 2021 CHPP presented interpolated salinity maps that were created using DMF, AMS, and NC Wildlife Resources Commission measurements for different river flow regimes, and Secchi depths from DMF independent sampling programs were used to develop the proposed water clarity standard (Hall 2022).

Few continuous water quality monitoring stations are active in North Carolina. The National Parks Service runs a water quality station for the Cape Hatteras National Seashore in Ocracoke. NC Division of Coastal Management's (NC DCM) Coastal Reserve and National Estuarine Research Reserve (NC CR & NERR) have a limited number of water quality stations at three reserve sites as part of the NERRS System Wide Monitoring Program (Zeke's Island and Masonboro Island Reserves) as well as a partnership with the National Parks Service (Rachel Carson Reserve and Shackleford Banks). These stations collect continuous temperature, salinity, dissolved oxygen, turbidity, and pH; monthly chlorophyll a and nutrient concentrations are also sampled.

DMF deploys a coastwide array of temperature loggers at 52 stations to collect continuous water temperature data to monitor cold stun events for Spotted Seatrout management (NCDMF 2025b). DMF previously used water quality sondes that record additional

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continuous parameters, including DO, for River Herring management and to assist with site selection and monitoring of oyster sanctuaries and artificial reefs. However, they required extensive maintenance and were discontinued in 2021 due to insufficient staff time and funds.

Shell bottom

Shell bottom habitat includes areas that have surface shell concentrations of living or dead oysters (*Crassostrea virginica*), hard clams (*Merceneria merceneria*), or other shellfish in estuarine waters. Oyster reefs are vital to the estuarine ecosystem, providing structured habitat for fish and invertebrates to forage and seek refuge, in addition to enhancing sediment stabilization, shoreline protection, and nutrient cycling. Historical loss of shell bottom habitat has occurred in NC due to habitat destruction, overfishing, disease, and deteriorating water quality (NCDMF 2025a; Lenihan and Peterson 1998; Powers et al. 2009).

In addition to being a structured habitat, North Carolina has regulated the oyster fishery as far back as 1872. Under the Fisheries Reform Act of 1997, the DMF has been developing and reviewing fishery management plans for oysters since 2001, with the most recent amendment to the Eastern Oyster Fishery Management Plan adopted in 2025 (NCDMF 2025a). DMF monitors commercial landings from wild harvest as well as landings from private aquaculture, but there are insufficient data to conduct a traditional stock assessment. DMF partnered with researchers at North Carolina State University and The Nature Conservancy to design a statistically robust fishery-independent population survey for oysters in North Carolina; however, DMF currently lacks sufficient resources to implement the program.

DMF monitoring of oyster habitat occurs through SCUBA surveys (Program 612) and tong surveys (Program 628), spanning artificially enhanced habitats (sanctuaries and cultch reefs) and natural oyster beds. These surveys aim to evaluate reef performance and quantify the contribution to the state's oyster fishery and benthic habitat. Generally, oyster sanctuaries are evaluated annually for oyster density and population demographics via quadrat extraction and subsequent oyster measurements. Cultch sites are sampled annually for three years, post-construction, using a tong survey (formerly a mechanical dredge) to track oyster density and population demographics. While cultch planting has been occurring since 1915, formal record keeping of geospatial data began in 1981 with limited resolution. Furthermore, long-term monitoring on cultch sites beyond three years post-construction is not conducted due to funding and logistical constraints. Both sanctuary and cultch reefs are also evaluated opportunistically via side scan sonar and

multi-beam bathymetry to provide a metric of material persistence and reef rugosity through time.

A pre-season and mid-season survey occurs to assess oyster condition in DMF's efforts to manage the mechanical (dredge) wild oyster fishery. With the adoption of Amendment 5 to the Eastern Oyster FMP in 2025, this survey was redesigned and replaced the oyster dredge as sampling gear to a hydraulic tong to improve standardization and cohesion with existing oyster surveying programs. Under the new survey, historical cultch sites are surveyed as well as areas open to mechanical harvest identified by stakeholders. Ten locations in each of the four management areas will be sampled for oyster metrics before the start of the mechanical harvest season as well as before the mid-season point to determine the length of the area's mechanical harvest season.

Additionally, two Deepwater Oyster Recovery Areas (DORAs) were established at the mouth of the Pamlico and Neuse Rivers as part of Amendment 5 to the Eastern Oyster FMP to prohibit mechanical harvest of deep-water reefs, which are vulnerable to hypoxia events. Monitoring is underway and includes side-scan sonar and multi-beam bathymetric surveying to assess the reef footprint as well as SCUBA surveys to assess oyster density and population structure throughout the course of five years prior to the next fishery management plan review.

Intertidal reefs, which occur in high salinity regions, are currently monitored with a remote sensing pilot program. The Remote Sensing Estuarine Bottom Habitat Mapping Program (DMF Program 636), pairs remote sensing in conjunction with ground truthing to produce high resolution maps of intertidal oyster habitat. Fifteen 100-acre sentinel sites were selected to develop best practices for drone monitoring and ground truth sampling methods which tentatively will be visited every three years.

Submerged aquatic vegetation

Submerged aquatic vegetation (SAV) is habitat dominated by one or more species of underwater vascular plants. SAV is recognized as essential fish habitat because of five integrated features – primary production, structural complexity, modification of energy regimes, sediment and shoreline stabilization, and nutrient cycling. There are two distinctive groups of SAV ecosystems in NC distributed according to estuarine salinity. One group, referred to as low salinity SAV, or underwater grasses, thrives in fresh and low salinity riverine waters (≤10 ppt), and includes species such as Redhead grass (*Potamogeton perfoliatus*), Wild celery (*Vallisneria americana*), and Sago pondweed (*Stuckenia pectinate*). The second group, referred to as high salinity SAV, or seagrass, occurs in moderate to high (>10 ppt) salinity estuarine waters of the bays, sounds, and tidal

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creeks, and includes three species: temperate eelgrass (*Zostera marina*), tropical shoal grass (*Halodule wrightii*), and cosmopolitan widgeon grass (*Ruppia maritima*).

DMF and APNEP have collaborated on statewide SAV monitoring projects since 2006. In 2021, APNEP adopted a robust three-tiered monitoring plan for the Albemarle Pamlico Estuary System region to support their Comprehensive Conservation and Management Plan (APNEP 2025). Tier 1 monitoring characterizes the distribution and extent of SAV using remote sensing and has been conducted intermittently since 2006. Tier 2 monitoring captures the spatial-temporal variation in seagrass population structure and abundance to describe the ecological condition over time. Some Tier 2 data have been collected since 2006, but with the adoption of the 2021 SAV monitoring plan, sampling now includes a wider scope of SAV and environmental data. Tier 3 monitoring is conducted more frequently, and at a smaller spatial scale, to address the drivers and outcomes of patterns observed in Tier 1 and 2 monitoring.

Monitoring in the APES region has found that high-salinity SAV meadow area has continually declined and shifted towards more patchy and fragmented meadows (Field et al. 2026). The 2021 CHPP aimed to develop and implement a full-scale assessment program to conduct coastwide SAV mapping and monitoring at regular intervals (≤ 5 years). Some SAV mapping and monitoring has been conducted outside of the APES region, but it does not occur on a regular basis.

Wetland

The CHPP uses a simplified Cowardin System to classify wetlands in NC, which splits wetlands into two broad classes: palustrine and estuarine (Cowardin et al. 1979). Palustrine wetlands include all non-tidal wetlands that are dominated by trees, shrubs, or emergent vegetation, as well as any tidal wetlands where ocean-derived salinities are less than 0.5 parts per thousand (ppt). Wetlands with ocean-derived salinities greater than 0.5 ppt are categorized as estuarine wetlands, which can be further divided by vegetation type into forested, scrub/shrub, and emergent estuarine wetlands.

Wetland maps are fundamental to wetland inventories, which are critical to management, restoration, protection, and informed development. The two primary wetland mapping sources that provide coastwide wetland distribution data include the National Wetland Inventory (NWI) and DCM's Wetland Inventory. NWI produces wetland and deepwater habitat maps throughout the United States using aerial imagery and is the most extensive inventory of wetlands in the United States. The accuracy of imagery interpretation that informs NWI maps is dependent on the quality of the imagery, availability of ground truthing data, and repeatability by photointerpretation analysts. DCM created a coastwide wetland inventory in the mid-1990's using NWI data, landcover classification from satellite

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imagery (Landsat data), and county-level soils data. The resolution and accuracy of these efforts, along with older imagery, limit the modern applications of DCM's wetland inventory.

NOAA Coastal Change Analysis Program (C-CAP) data has been used to measure wetland area over five-year periods since 1996 at 30m x 30m resolution. NOAA C-CAP now can generate spatially robust, high resolution (1m x 1m pixel) land cover inventories and map products. In 2024, the DMF, DCM, DWR and APNEP combined monetary resources with South Carolina agencies to fund an update to C-CAP land classification for the states using 2020-2021 imagery at one meter resolution. These maps are expected to be available in early 2027 and will enable North Carolina to better identify and quantify wetland change (2021 CHPP action 5.1).

The Wetland Program Plan (NC WPP) is developed by NC DWR with a stakeholder group on five-year cycles to guide actions to research and protect wetlands. It emphasizes the need for systematic monitoring to track wetland health and called for standardized wetland mapping methods for the state. The plan is currently being updated and will be finalized in 2026.

Long-term monitoring of elevation change using surface elevation tables (SET), which are portable mechanical instruments that provide high-resolution measurements of elevation change within wetland sediments. North Carolina Surface Elevation Table Community of Practice is a voluntary partnership of stakeholders who have SETs in North Carolina coastal wetlands or use SET data (North Carolina SET Community of Practice 2024). There are currently over 130 SETs throughout coastal NC generating information on the degree to which coastal marshes are keeping up with sea level rise. This partnership has provided on the ground validation of wetland vulnerability modeling at greater scales (e.g., remotely sensed unvegetated-vegetated ratios) and found the majority of marshes monitored by SETs are not keeping up with sea level rise (North Carolina SET Community of Practice 2024).

There are also numerous short term data sources from DEQ programs, universities, and NGOs conducting research on coastal wetlands. However, the inconsistent sampling methodologies in these studies have impeded efforts to combine data to generate a meaningful picture of habitat condition at broader spatial or temporal scales. The Division of Mitigation Services (DMS) also compiles monitoring reports for compensatory mitigation projects, and the Wildlife Resource Commission (WRC) has conducted monitoring to assess abundances of select fauna of interest.

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Expanded long-term funding opportunities should also be explored. Wetland monitoring conducted by DWR has been funded primarily by the EPAs Wetland Program Development Grants that typically focus on short-term monitoring projects. To provide a spatially robust inventory of the condition of the state's wetland resources over ecologically meaningful temporal scales, there is a need to move away from a dependence on external grant funding, which can be intermittent and variable in their research objectives, to recurring funding for standardized wetland monitoring that is critical to generating the data needed for science driven management.

Hard-bottom

Natural hard bottom habitat includes exposed areas of rock or consolidated sediments, distinguished from surrounding unconsolidated sediments, which may or may not be characterized by a thin veneer of live or dead biota (Street et al. 2005). Hard bottom is the primary structured habitat for offshore marine organisms on the continental shelf of NC. The hard structure provides a foundation for sessile invertebrates and algae, and the structural complexity provides a refuge and foraging habitat for mobile fauna, including both juvenile and adult life stages of economically important fish.

There is limited information on the distribution of productive live hard bottom off the NC Coast (Riggs et al. 1996; Moser and Taylor 1995; Udouj 2007). The majority is limited to specific areas of the continental shelf. Ninety percent of known hard bottom is found south of Cape Hatteras in the ocean rather than estuarine systems(Moser and Taylor 1995). Sampling methods and classification can be subjective, making it difficult to determine the distribution (Conery et al. 2022). The ephemeral nature also makes it particularly difficult to quantify because it can become periodically buried with sand (Riggs et al. 1996).

The NC DMF Artificial Reef Program maintains 43 oceanic artificial reefs to provide public recreational opportunities for fishing and diving, while adding structured hard-bottom habitat to primarily soft-bottom systems. The constructed reefs are monitored annually using SCUBA surveys for material stability, environmental parameters, and fauna communities. Hydrographic mapping surveys are also conducted on established artificial reefs periodically according to programmatic need.

The 2021 CHPP Amendment called for DMF to develop a monitoring strategy to map natural hard bottom reefs in NC state waters and monitor the condition of both natural and artificial reefs (2021 CHPP Recommended Action 8.5). Although DMF has established workflows to conduct monitoring, the scale of operations necessary to provide consistent mapping requires significant resources, including long-term funding for survey staff, boats, and equipment. Furthermore, other programmatic needs (oyster sanctuary, cultch planting, artificial reefs) limit existing available resources for devoting survey efforts

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towards hard-bottom mapping. The division will continue to periodically review the feasibility of adding new monitoring of hard-bottom habitat to its existing efforts.

Applying ecosystem-based management tools to understand coastal habitat status and trends

Coastal landscapes are made up of a mosaic of habitat components, including the ones above, that are affected by humans who live there. The CHPP has recognized the need to incorporate ecosystem-based management (EBM) into coastal resource conservation strategies in North Carolina. This approach incorporates the entire ecosystem, including humans, into resource management decisions, and is guided by adaptive management. Both the 2016 CHPP and 2021 CHPP amendment outlined management actions to develop indicator metrics for monitoring the status and trends of each individual habitat and establish thresholds to initiate pre-determined management actions. Since substantial resources are needed to establish comprehensive long-term monitoring for a suite of indicators for each habitat, DEQ must explore alternative approaches such as an ecosystem level evaluation.

Ecosystem assessments are used to provide the necessary science to carry out ecosystem-based management. An Integrated Ecosystem Assessment (IEA) is a formal synthesis and quantitative analysis of natural and socio-economic factors relative to specific management objectives (Levin et al. 2014). The framework as described by Levin et al. (2009) is used by NOAA to support adaptive Ecosystem Based Management. This framework was supported by the CHPP since 2016 and was recommended by the NC Policy Collaboratory as a model of a qualitative indicator-based evaluation of the estuarine and coastal ecosystems in its report (NC Collaboratory 2026).

This process relies on clearly defined management objectives that are co-designed with stakeholders. Scientists, managers, and stakeholders establish the vision and determine which ecosystem components, threats, and spatial scale are relevant to the management objectives. Examples of objectives include seafood production, commercial profits, recreational opportunities, ecosystem stability, social and cultural values, and protected species (Northeast Fisheries Science Center (U.S.) 2026). Conceptual modeling is conducted to describe and define the ecological system of interest including important connections and cascading effects of changes in components.

Ecosystem assessments use monitoring data as environmental indicators to characterize the aspects of the ecosystem that are relevant to the established management goals. Indicators are most effective when they are directly observable, scientifically rigorous, supported by a historical time series, cost effective to measure, understandable to the

DRAFT

public, and sensitive to change in the ecosystem or management actions (Levin et al. 2014). In the assessment process, potential indicators are inventoried and then are evaluated to determine if they are an appropriate metric. In North Carolina, the Albemarle Pamlico National Estuary Program conducted an ecosystem assessment in 2012 (Carpenter and Dubbs 2012). In the development they defined and evaluated indicators for a comprehensive ecosystem assessment of the APES region that describes the status of the system and identifies threats to prioritize addressing through management. The range of data sources on coastal habitats and water quality discussed above in the *Current habitat and water quality monitoring programs* section serve as likely candidates to use as ecosystem indicators, along with additional data collected by external partners.

To track progress towards EBM goals, indicator variables need to have science-based reference levels to measure ecosystem state and determine the magnitude of ecosystem pressures. Indicators then need an established target level to identify quantitatively if the desired ecosystem status is reached. Targets as well as established thresholds can also be used to trigger management actions.

Once indicator data is compiled, the ecosystem is assessed using the status of the selected indicators. NOAA's IEA programs teams produce Ecosystem Status Reports for management regions that describe the status and trend of each indicator that was selected for specific management needs. Ecosystem status reports have been produced for each fishery management council region in the United States; however, the South Atlantic has only had one ecosystem status report (Craig et al. 2021), while other regions have annual ecosystem assessments with communication tools for outreach with the public.

Even though ecosystems assessments are co-designed with stakeholders, they are long technical reports, which can be hard for decision makers to interpret and apply to management strategies. While the ecosystem status reports synthesize ecosystem information, "state of the ecosystem" reports are commonly produced in some regions (e.g. the 2025 New England State of the Ecosystem report), putting decisions into a broader context.

Ecosystem report cards are another stakeholder driven assessment and communication tool used to compare ecological, social, and/or economic information (Vargas-Nguyen et al. 2020; Costanzo et al. 2017). Report card developers set evaluation goals and criteria to calculate a number or letter grade, like a school report card, to determine the status of the ecosystem. Report cards distill complex data from multiple sources into a format that is easily accessible to wide audiences. By incorporating a range of stakeholders in the development process, the report card helps create a shared vision for the future of the

DRAFT

ecosystem. This information is then used to educate the public about the habitat condition, inform protection and restoration efforts, and evaluate the effectiveness of management strategies to achieve the overarching CHPP goal of the long-term enhancement of fisheries associated with coastal habitats.

Report cards can be flexible in that managers can choose indicators from the data that are available, and report cards can be easily updated if new data streams become available. The University of Maryland's Integration & Application Network (UMCES IAN) has developed a process for creating ecosystem report cards since 2006 and has refined its processes for stakeholder facilitation and index analysis (Costanzo et al. 2017). One example produced by UMCES IAN, the Coastal Georgia Ecosystem Report Card, evaluates the health of Georgia's ecosystems and uses twelve indicators to examine human health, fisheries, and wildlife annually (2014-2024). The evolution of the coastal Georgia ecosystem report cards, which updated indices based on relevance and importance, is an example of how this approach can be refined as more data or an improved understanding of the ecosystem is available. Another example, the Chesapeake Bay ecosystem report card, implements an especially data rich reporting effort (Logan et al. 2020) that produces a static report card publication as well as an interactive counterpart through Eco Health Report Cards, which allows users to explore data time series at various spatial scales.

Using a state report card for a coastwide ecosystem assessment

An ecosystem report card would provide the foundation to work toward ecosystem-based management in North Carolina and meet CHPP goals of understanding the status and trends of the state's coastal habitats (2021 CHPP recommended actions 8.1 and 8.2). DMF will begin with internal scoping discussions to establish broader ecosystem-scale fishery management objectives based on relevant legislation, regulatory requirements, established management practices, and the agency's mission and strategic guidance. This process will help determine the conceptual scope of the report card and ensure that the development and final products can be integrated into decision-making.

As a collaborative process, development will require stakeholder engagement. To ensure that the final product has been co-designed and fosters stakeholder buy-in, DEQ will conduct a stakeholder mapping exercise at the start of development to identify the breadth of stakeholders (both in role and spatial variation) in the state. These stakeholders will be invited to participate in a workshop which will be held to identify both local values and challenges to meet ecosystems objectives. This process helps ensure that the final product has concurrence, relevance, and meets the values of stakeholders. The stakeholder workshop output will be a conceptual framework and a short list of potential indicators and thresholds associated with the values and identified threats.

DRAFT

Although stakeholder driven, the foundation of an ecosystem report card is a thorough ecosystem assessment. Sourced from stakeholders and experts, data inputs will include the indicators that were identified in the stakeholder workshops. The NC Collaboratory's Legislative Study of Coastal and Marine Fisheries Report has already analyzed 170 potential indicators to understand how ecosystems are changing over time, the drivers of change, and the status of current monitoring (NC Collaboratory 2026). Indicators that meet the spatial and temporal resolution requirements can be included in the report card.

Once the conceptual framework and potential indicators are established by the stakeholder workgroup, scientists and managers will evaluate those indicators to determine which indicators best reflect the ecosystems and develop thresholds that will be transformed into easy-to-understand grades (A, B, C, D, F).

The report card will be drafted to include information capturing the existing health of the state's coastal ecosystems, distilling the key messages into an image-rich format easily accessible to a wide audience. A second stakeholder meeting will be held to discuss report card draft results, conclusions, and recommendations. Relevant feedback will then be taken into consideration for the final version. The complete methodology will be documented to ensure that the report card is scientifically defensible and can be updated regularly between each CHPP cycle.

The completed ecosystem report card will offer several benefits to DEQ and stakeholders. The report card will provide a simple, accessible way for the public to understand the overall status of coastal ecosystems and how that has changed over time. The report card will also serve as an additional tool for decision makers when considering environmental and fishery management options. This tool will also aid in facilitating discussions for building capacity and enhancing resolution and frequency of monitoring ecosystems.

Improving the use of ecosystem data in fishery management

In addition to providing tools for the public, the ecosystem assessment and report card development processes will help enhance the use of ecosystem data in DMF's fishery management. Integrating ecosystem data into fishery management decision-making will require a division-wide effort that can be initiated across DMF's programs. Beginning with the ecosystem data assembled as input for the ecosystem report card, a working group should be established to discuss how to accomplish integrating ecosystem data into development of FMP strategies.

One approach to better incorporating ecosystem data into fishery management could be emphasizing fish habitat use and life history bottlenecks during each fishery management plan cycle. Like the process of defining the ecosystem for an assessment, this approach

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would identify a conceptual map of a species' life cycle along with indicators and thresholds that would support management decisions. This process would also help identify specific research gaps and data needs to support incorporation of ecosystem data into a fishery stock assessment.

Once ecosystem assessments are conducted at regular intervals, DMF could also begin to apply risk assessments into the fishery management process. Risk assessments evaluate the impacts that natural disturbances and human activities would have on the ecosystem status. The goal of risk assessment is to qualitatively or quantitatively determine the likelihood that an ecosystem indicator will reach or remain above reference points (e.g., an established baseline level) that indicate an undesirable status. At a basic level, the sensitivity of an indicator to a stressor and the exposure to that stressor is calculated or mapped into high, medium, or low risk categories. More comprehensive risk assessments can be used to evaluate the cumulative effects of multiple stressors on many ecosystem components. Improved understanding of the risks to fisheries associated with the status of ecosystem indicators can inform decision-making in fishery management when traditional management tools (i.e. stock assessments) are unavailable, or when fishery decision-makers want to base decisions on a broader range of information.

Recommended actions

1. Establish internal working group to establish goals of an ecosystem assessment and state ecosystem report card.
2. Conduct workshops with stakeholders, scientists and managers to select ecosystem indicators and establish appropriate thresholds.
3. Calculate scores and create a state report card that is easily accessible to a wide audience.
4. Communicate status and trends of coastal ecosystems to stakeholders, decisionmakers, and the public.

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Strategic Habitat Area validation and implementation plan development

Executive summary

Through previous CHPPs, DMF used a conservation planning tool that incorporated spatial analysis and subject matter expert input to identify a network of high-quality habitat areas in coastal watersheds, referred to as Strategic Habitat Areas (SHAs). SHA nominations for the four CHPP regions were completed in 2017, and field sampling was conducted in two regions (Regions 3 and 4) to verify that the habitat condition and biological productivity of nominated areas were high. Results from the field survey validate that nominated areas support a higher abundance of diverse fish populations. In combination with findings that Strategic Habitat Areas have a more diverse estuarine landscape, a higher area of structured habitats, and less alteration than areas outside of SHAs, the results of this validation study further support the designation of the nominated Strategic Habitat Areas. These results will be combined with additional analysis of DMF independent sampling data in a future issue paper that presents validation of Strategic Habitat Areas statewide and proposes designation options to the Marine Fisheries Commission. Strategic Habitat Area management options will then be developed through stakeholder engagement and collaboration with state, federal, and private partners and presented in another issue paper to rulemaking commissions and external partners.

Introduction

Early in the development of the first Coastal Habitat Protection Plan (CHPP), the CHPP Steering Committee identified the need to prioritize conserving areas that were most critical for fishery production and in need of protection. The second goal of the original CHPP was to “Identify, designate, and protect Strategic Habitat Areas (SHA).” (Street et al. 2005) Strategic Habitat Areas were defined as “locations of individual fish habitats or systems of habitats that provide exceptional habitat functions or that are particularly at risk due to imminent threats, vulnerability, or rarity" (15A NCAC O3I .0101 (4)(h), (Street et al. 2005, Deaton et al. 2010, NCDEQ 2016). To prioritize areas to protect, CHPP staff applied the understanding that ecosystems with diverse arrays of interconnected habitats can function better and provide more services compared to discrete isolated patches of habitats (Preston et al. 2025). Choosing areas representative of the entire ecosystem can help protect habitats necessary for various life stages to support fisheries.

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The process to identify Strategic Habitat Areas was established in 2006 under the guidance of a committee of scientists and natural resource managers with a wide scope of expertise in fisheries and coastal habitats (Deaton et al. 2006). The committee developed a scientifically based process for identifying candidate areas for designation using biological data and the consensus of a regional expert panel, with a target of designating approximately 20% of the area of natural resource targets in each of the four CHPP regions as Strategic Habitat Areas (NRC 2001).

The desired areas would have high biodiversity and ecological function, be relatively unaltered, have strong landscape connections between structured habitats, and need protection (Figure 1). Management options would be site specific – SHAs with exceptional ecological function would be priority locations for protection, while areas experiencing threats that risk diminishing their ability to support coastal fisheries would be candidates for restoration or enhancement.

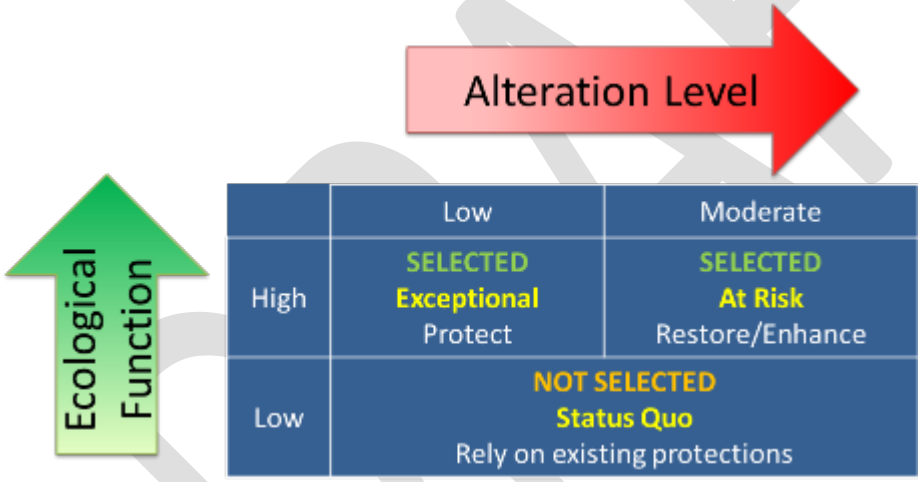


Figure 1. Selection criteria for Strategic Habitat Areas based on level of ecological function and habitat alteration level and the resulting management strategies (e.g., protect, restore/enhance) based on these gradients.

The SHA identification process consists of three main phases, each of which requires input from a regional advisory committee. The first phase in the SHA process is to identify priority species and habitats and build a GIS database of existing biological and anthropogenic use data for the region. For each region, the DMF Management Review Team (now the Directors Advisory Team) selected the priority and/or traditional fisheries for the area based on their importance to both the recreational and commercial fishing industries in the region.

DMF staff assembled the available data, which was reviewed by the regional advisory committee to ensure that it had sufficient spatial coverage and relevance to be included.

Then the committee examined the priority fish species for the region and recommended representation levels of each habitat (natural resource target) that should be included in the final SHA network. The committee also recommended how to rank alteration factors to calculate and map an alteration index for the region. The second phase of the process was to run the site selection software Marxan (Game and Grantham 2008, Ball et al. 2009) to select initial areas that met the established criteria for selection.

Once the Marxan modeling was complete, in the third phase an expert committee reviewed selections and used corroborating information and their own ecological knowledge to modify the boundaries of the SHAs and derive a final network of SHA nominations. Final SHA nominations incorporate expert scientific knowledge to consider additional biological information and socio-economic factors that may not have been included in the Marxan inputs.

Nominations were then peer-reviewed, sent for public comment, and presented to the Marine Fisheries Commission. For additional details about the specific data layers, prioritization, and expert decision-making process, see the Strategic Habitat Area nomination report for each region.

Region overviews

Four regional analyses were done to identify SHAs in coastal waters for each CHPP region. Region 1 (Albemarle Sound System), Region 2 (Pamlico Sound system), Region 3 (White Oak River Basin), Region 4 (Cape Fear River Basin) were completed in 2009, 2011, 2014,

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2019 respectively.

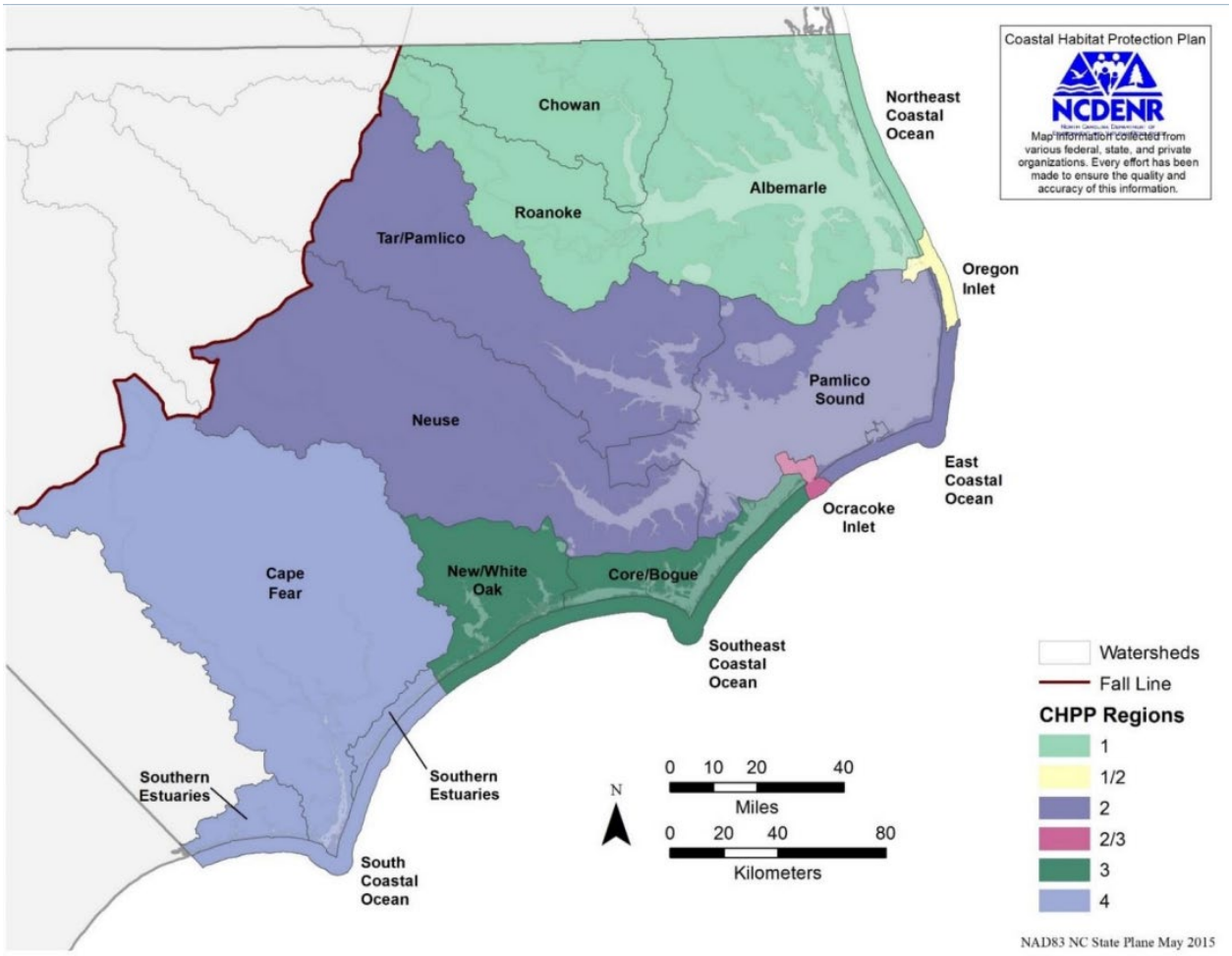


Figure 2. Map of CHPP regions and watersheds. Oregon Inlet is counted toward both regions 1 and 2, and Ocracoke Inlet is counted toward both regions 2 and 3.

Table 1. Characterization of nominated Strategic Habitat Areas broken down by number of units, area, and proportion of region (%).

Region	SHA Units	Area (a)	Area (%)
1	20	490315	20
2	67	322843	26
3	48	134547	19
4	43	74451	21

Albemarle Sound System (Region 1)

Region 1 includes the waters and adjacent wetlands draining into and out of Albemarle Sound through Oregon Inlet to the adjoining coastal ocean (NCDMF 2009). It includes the sounds and tributaries of the Albemarle, Currituck, Roanoke, and Croatan Sounds, as well as the nearshore ocean.

Most of the Albemarle Sound system is lined with bottomland hardwood wetland forests. The eastern sounds are lined with brackish marsh and support SAV habitat and scattered areas of shell bottom habitat. Because Oregon Inlet is the only inlet in the northern portion of the Albemarle-Pamlico system, it is a critical fish corridor. Priority species included the traditional fisheries of blue crab, river herring, and striped bass. SHA nominations included 20 areas that make up 490,315 acres or 20% of the region.

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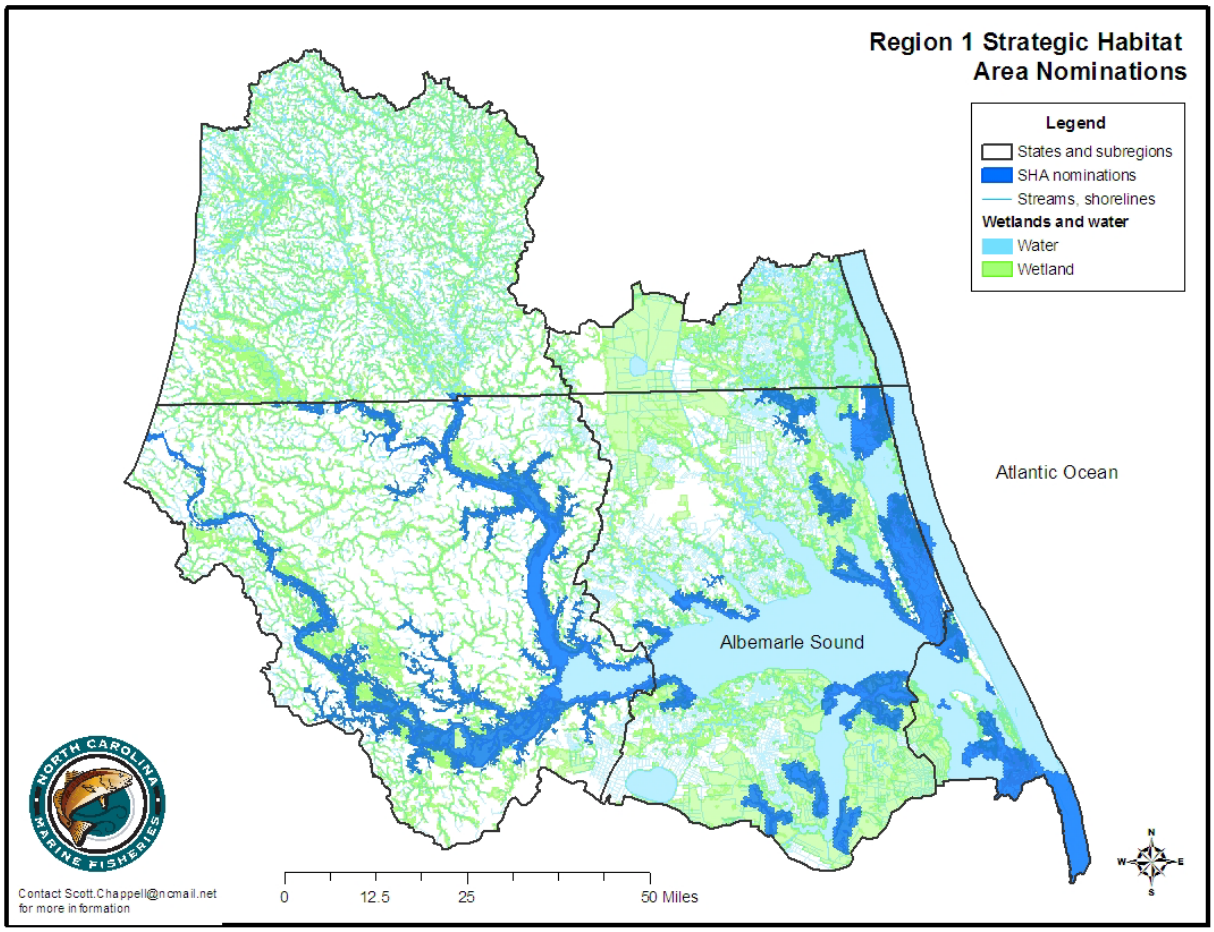


Figure 3. Nominated Strategic Habitat Areas within CHPP Region 1.

Pamlico Sound System (Region 2)

Region 2 includes the waters and adjacent wetlands draining into and out of Pamlico Sound through both Oregon and Ocracoke Inlets to the adjoining coastal ocean (NCDMF 2011). It comprises the sounds and tributaries of Pamlico Sound and the Tar-Pamlico and Neuse rivers up to the fall line separating Coastal Plains and Piedmont physiographic regions. The boundaries of the study area were based on the CHPP subregions of Pamlico Sound, Tar-Pamlico River, Neuse River, adjacent coastal ocean, Oregon Inlet and Ocracoke Inlet (Deaton et al. 2010).

Habitat features that contribute to the integrity and exceptional productivity of the Pamlico Sound system include extensive SAV beds behind the Outer Banks and along the rivers, intertidal and subtidal oyster rocks, and Primary Nursery Areas. Priority species include blue crab, Eastern Oyster, Red Drum, shrimp, Southern Flounder, and Spotted Seatrout. 67 discrete areas have been nominated in Region 2 that make up 322,843 acres or 26% of the region.

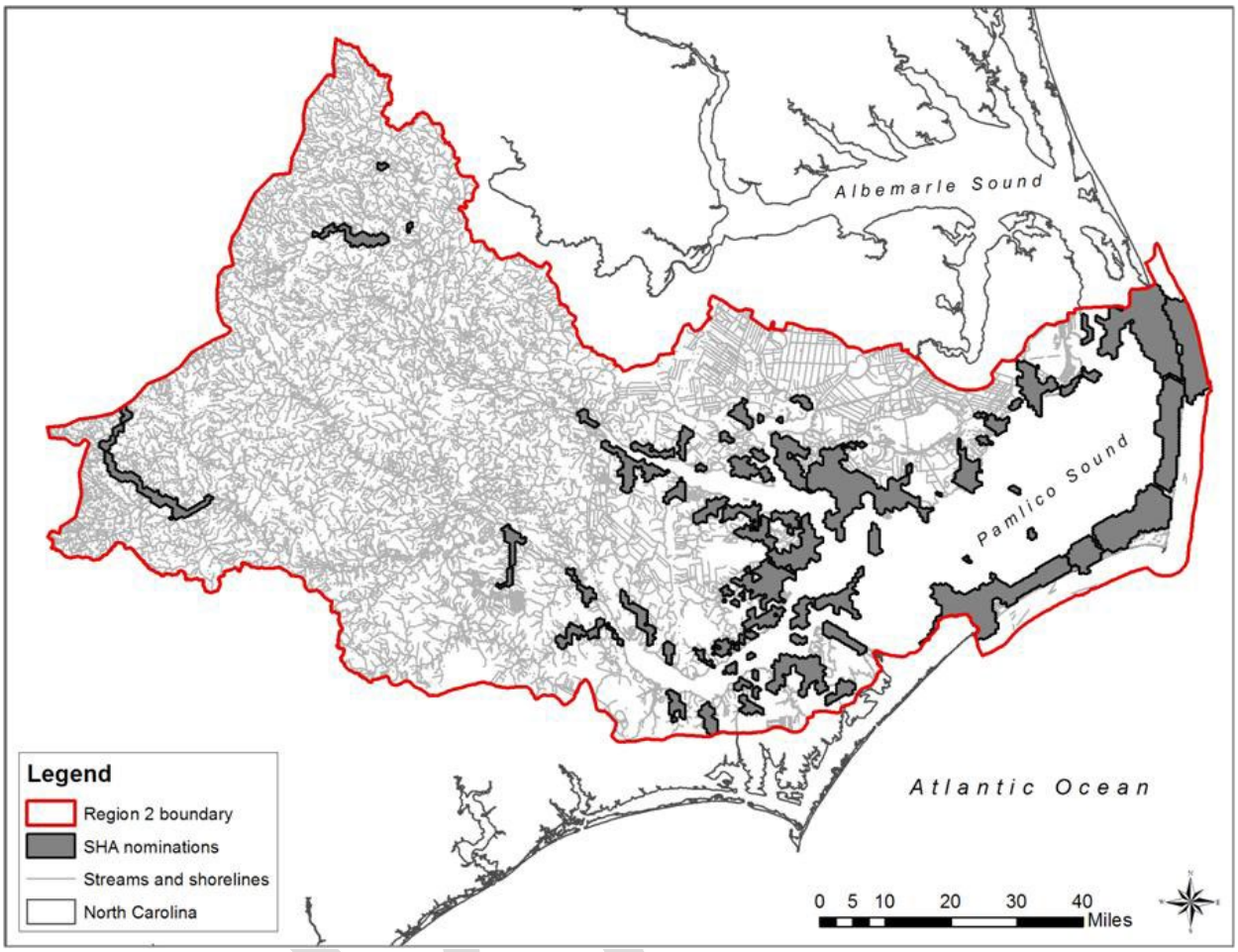


Figure 4. Nominated Strategic Habitat Areas within CHPP Region 2.

White Oak River Basin (Region 3)

Region 3 includes waters in Carteret and Onslow counties, as well as a small amount of Jones and Craven counties, and the entire watershed is contained within the White Oak River Basin (Jensen et al. 2014). This region lacks extensive riverine systems and consists primarily of estuarine waters and small to moderate sized sounds such as Core, Bogue, and Stump sounds. New River is the largest river.

Submerged Aquatic Vegetation (SAV) and wetlands (marsh and forest) are extensive, and intertidal and subtidal oyster reefs and ocean hard bottom are also present. Oyster, clam, Bay Scallop, Blue Crab, shrimp, Southern Flounder, Red Drum, Spotted Seatrout, Weakfish, and Spot were determined to be priority fishery species in this region, and an important nursery area for gag grouper and black sea bass. There were 48 discrete SHA units selected within region 3, comprising 134,547 acres or 19% of the region.

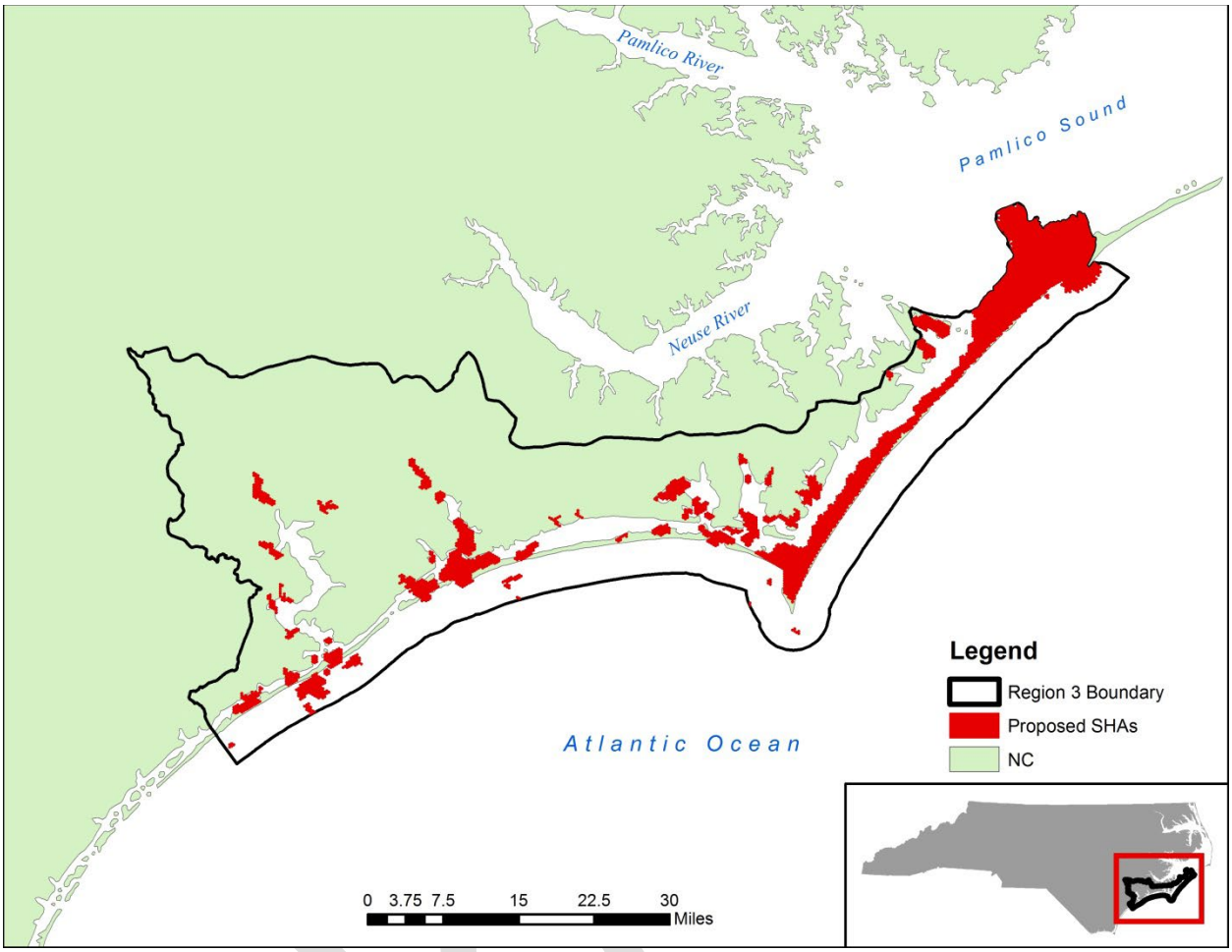


Figure 5. Nominated Strategic Habitat Areas within CHPP Region 3.

Cape Fear River Basin (Region 4)

Region 4 is the southernmost region and includes riverine and estuarine waters in Pender, New Hanover, and Brunswick counties, as well as portions of Duplin, Sampson, Bladen, and Cumberland counties (Knight and Deaton 2018). It includes the Cape Fear River system upstream to approximately Lillington, the historical anadromous fish spawning grounds of Smiley Falls (approximate fall line).

The estuarine waters include multiple small tidal creeks and sounds, and extensive intertidal oyster reefs and marsh habitats. Relatively small areas of SAV occur in the northern portion of the region. The priority fisheries species of the Cape Fear River Basin include Eastern Oyster, Hard Clam, Blue Crab, shrimp, Bay Scallop, Southern Flounder, Red Drum, Spotted Seatrout, kingfishes, and Spot. The Cape Fear River system is vital to anadromous species, including Striped Bass, American shad, River Herring, and sturgeon, that migrate upstream for spawning; while the nearshore provides important habitat for gag

grouper, black sea bass, sheepshead, and mackerels. There were 43 discrete SHAs selected within Region 4 comprising 74,451 acres or 21% of the area's waterbodies.



Figure 6. Nominated Strategic Habitat Areas within CHPP Region 4.

Strategic Habitat Area Validation (region 3 and 4)

Origin

While it is assumed that areas nominated as SHAs are beneficial to fish populations, DMF staff sought to further validate this assumption. Previous and ongoing research has provided additional scientific understanding of the relationship between nekton, habitat, and alteration (Peterson et al. 2000; Wyda et al. 2002; Lowe and Peterson 2014), informing the establishment of a validation program (DMF Program 215) to verify habitat conditions and fish productivity of SHAs. The objective of the study was to verify habitat condition and biological productivity by conducting extensive field sampling of target fish species in three fish habitats inside and outside of SHAs.

Methods

Sampling design

A stratified random sampling design was established for Region 3 and 4. The sampling universe consisted of 1 nmi^2 grids and was modified for boat access. For each sampling year approximately sixteen proportionally allocated SHA and reference sites outside of SHA boundaries were randomly selected to sample from February 15 -November 15. The time window was chosen to follow the timing of the Juvenile Trawl Survey (Program 120) and Fisheries Independent Assessment (Program 915). Within Region 3, 252 sites were sampled in 2018-2019, however, sampling was limited in September 2018 due to Hurricane Florence. Within Region 4, 126 sites were sampled in 2020-2021, with a suspension of sampling from March 26th until June 2nd, 2020, for the COVID-19 Pandemic. In Region 4, the sampling grid was downstream of Lyon Thorofare on the Cape Fear River and Cowpen Branch on the Northeast Cape Fear River. Sampling difficulties resulted in the exclusion of 16 SHAs in that area. Full details of sampling gear and techniques can be found in the NC DMF Program 215 program documentation (NC DMF 2018)

Nekton sampling

Fish sampling was conducted using Breder traps, gill nets and bottom trawls. An otter trawl was towed for 1 minute in duration across 75 yards. Four Breder traps were set, alternating orientation from perpendicular and parallel from the habitat edge. A scientific gill net (2", 3", 4", 5" stretched mesh panels) was set within 100 ft of shore where water depth is roughly 3 ft at MLW. Breder traps and gill nets were set at low tide and soak for at least three and four hours, respectively. All collected fish were identified to species level and counted. Target species were measured and weighed, and total biomass of all fish was recorded.

Mean standardized catch (MGMS) was calculated to create an index to represent the total catch of the three gear types (Gibson-Reinemer et al. 2017). Catch per unit effort was also calculated to conduct community level analyses for each gear type.

Habitat Characteristics

At each sampling location, the types of structured habitats present were recorded (marsh, SAV, shell). Habitat characteristics were quantified for habitat present using three haphazard 1/4m^2 quadrats. For marsh quadrats, shoot densities of *Spartina spp.* and *Juncus spp.* were counted and all other species present within the quadrat were recorded. In addition, the stem height of the tallest and three random shoots were measured. In shell habitats, the point intercept method was used (n=16) to calculate percent cover of live oysters. All biota in the quadrat was recorded. To quantify the oyster density, a smaller 1/16 m^2 quadrat was used and a subsample of 30 oysters was measured. To quantify SAV, the point intercept method was used (n=16 intercepts) to measure the cover (%) of SAV in the

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quadrat. All species present in the quadrat were recorded, and the shoot height of the tallest and three random shoots were measured.

The area of all structured habitats was calculated within each sampling grid. Shell bottom area was calculated from DMF's Estuarine Benthic Habitat Mapping Program's shell bottom maps, produced from 1990 to 2019. NOAA Coastal Change Analysis Program (CCAP) land cover data from 2016 were used to quantify wetlands extent ((National Oceanic and Atmospheric Administration, Office for Coastal Management 2016)). The NC DEQ SAV "mosaic" dataset, which outlines a historical extent of SAV habitat from aerial surveys conducted from 1981-2021, was used to calculate SAV area.

Alteration

At each sampling location the extent of hardened shoreline and eroded edge, and presence of shoreline basins, marinas and/or boat ramps, rock or wood structures perpendicular to shore, low profile (riprap) or wood structure parallel to shore, and vertical structures (i.e. bulkheads) was recorded.

Analysis

Since the sampling of the two regions did not occur at the same time, all statistical analyses were conducted within regions, so inferences between regions are limited to qualitative observations. All analyses were performed in R version 4.6.0 (R Core Team, 2026).

A permutational analysis of variance (PERMANOVA) was used to test differences in community composition between SHA treatments. The PERMANOVA used Bray-Curtis distances and 1,000 permutations, and was run using the 'vegan' package in R. A non-metric multidimensional scaling (NMDS) ordination was used to visualize community composition between SHA and non-SHA sites for each region. SIMPER analysis was used to identify which species contributed the most to dissimilarities. Hill-Shannon diversity index (Kempton 1979) species richness, and a rank-abundance curve were calculated to examine the biodiversity of the nekton species.

Because of the variance in species present, most variables violated the assumptions of ANOVA (non-normal distribution and unequal variances) so differences among groups were tested using the non-parametric Kruskal–Wallis test. Kruskal-Wallis tests were used to test differences between designated SHA and undesignated sites (reference, or "non-SHA," sites) for each region independently for habitat metrics. Pearson Chi-squared tests were used to compare the frequency of habitat presence and alteration frequency between Strategic Habitat Areas and reference sites.

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Results

Habitat Metrics

Analysis of the Region 3 and 4 habitat data confirm greater overall extent of the habitats investigated in this study (wetlands, shell bottom, and SAV) in the SHA sites compared to the non-SHA sites (Figure 7). SHAs had a significantly greater area of structured habitats in in Region 3 with 1,074,587±79,487 acres in SHAs and 568,885± 82,752 acres in non-SHAs ($\chi^2(1) = 18.596$, $p < 0.001$) and Region 4 with 1,402,093± 82,953 acres in SHAs and 637,418± 79,487 acres in non-SHAs ($\chi^2(1) = 29.510$, $p < 0.001$).

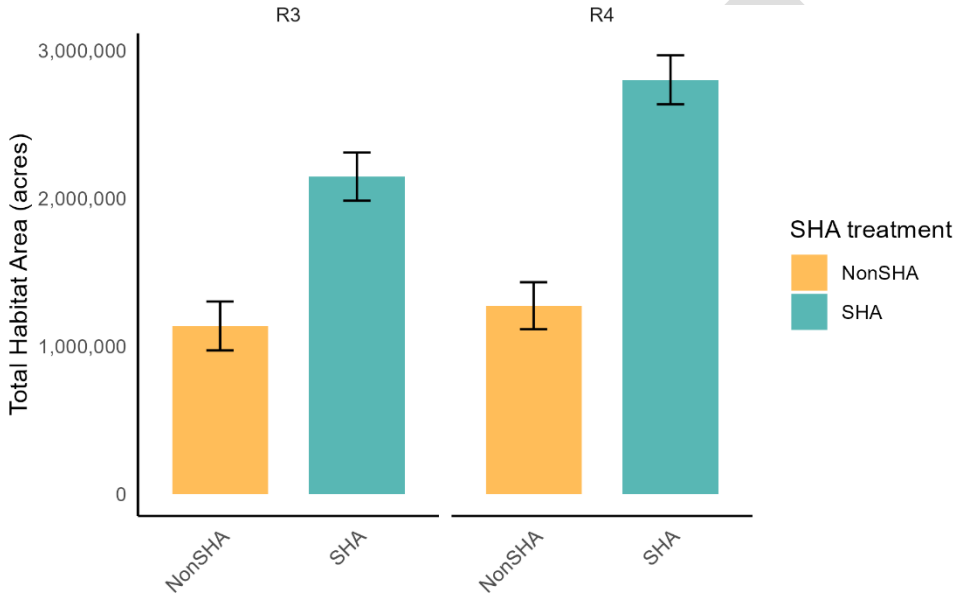


Figure 7. Total habitat area (acres) of structured habitats (SAV, oyster, wetlands) in sampling grids inside (SHA) and outside of Strategic Habitat Areas (non-SHA). Error bars represent ±1 standard error.

SHAs were also more likely to have multiple types of habitats present than reference sites. When looking at the average number of habitats at each sampling location, SHAs had a higher number of habitats (marsh, oyster, SAV) within the same landscape (Figure 8). In Region 3, SHAs had an average of 1.9 habitats present, while non-SHAs had only 1.4 habitats present on average ($\chi^2(1) = 18.596$, $p > 0.001$). Although the two regions were not statistically compared, the difference between reference sites and SHAs was greater in Region 4. On average, SHA sites had 2.2 habitats present and non-SHA reference sites had only 1.4 habitats present ($\chi^2(1) = 429.510$, $p > 0.001$). When examining the frequency of habitat presence, marsh habitats were present at nearly the same frequency in all SHA and reference sites. Oyster reefs occurred more frequently in SHAs than non-SHAs in both regions, but Region 4 had a higher frequency (Region 3, $\chi^2(1) = 10.297$, $p = 0.001$; Region 4 ,

$\chi^2(1) = 22.766$, $p > 0.001$). There was no significant difference in the frequency of SAV in Region 3, although SAV was higher in SHAs. In Region 4, SAV was only present in SHA sites ($\chi^2(1) = 10.242$, $p > 0.001$).

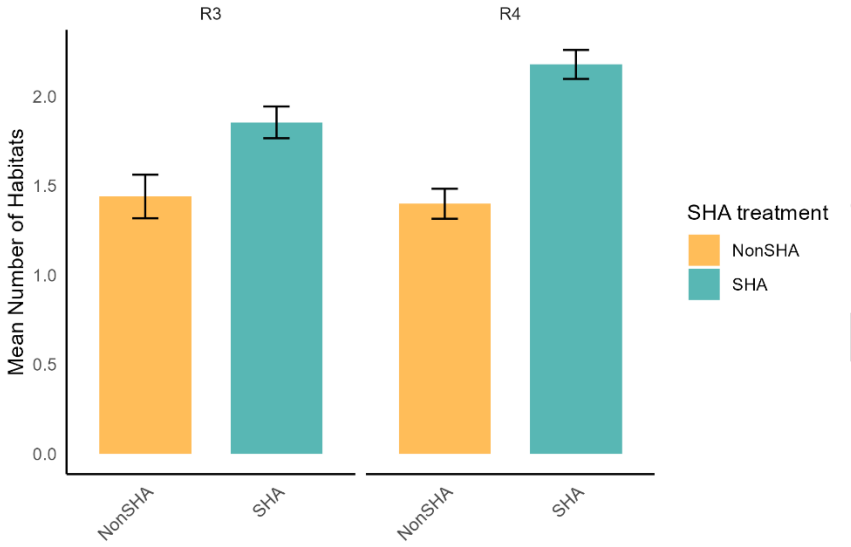


Figure 8. The mean number of structured habitats (marsh, oyster, SAV) found in Strategic Habitat Areas and reference sites. Error bars represent ±1 standard error.

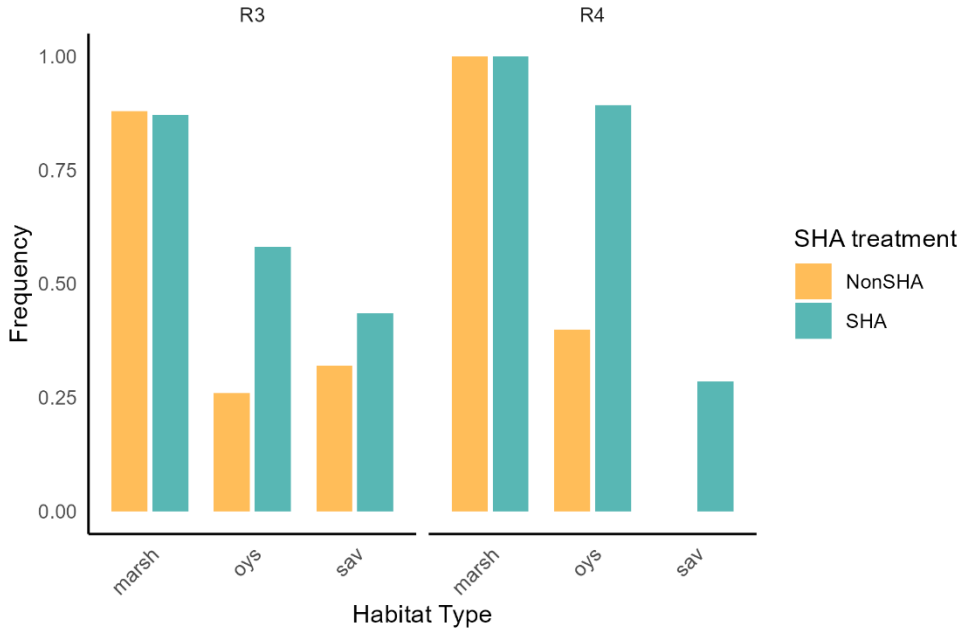


Figure 9. Frequency of structured habitats (salt marsh, oyster reef, SAV) in Strategic Habitat Areas and reference sites outside of Strategic Habitat Areas.

There is evidence that habitats in Strategic Habitat Areas were higher quality. In marsh habitats, *Spartina alterniflora* stem density (shoots / 0.25 m^2) was higher in SHAs than non-

SHAs (Figure 10; Region 3, $\chi^2(1) = 30.1$, $p < 0.001$; Region 4, $\chi^2(1) = 42.8$, $p < 0.001$). Oyster reefs had a higher live oyster cover (%) in SHAs than reference sites (Figure 11; Region 3, $\chi^2(1) = 4.883$, $p = 0.027$; Region 4, $\chi^2(1) = 14.090$, $p < 0.001$). SAV percent cover had the same pattern as habitat occurrence, with no difference between SHAs and reference sites in Region 3 (Figure 12; $\chi^2(1) = 0.973$, $p = 0.324$). Since SAV was absent from reference sites in Region 4, we could not test for statistical differences.

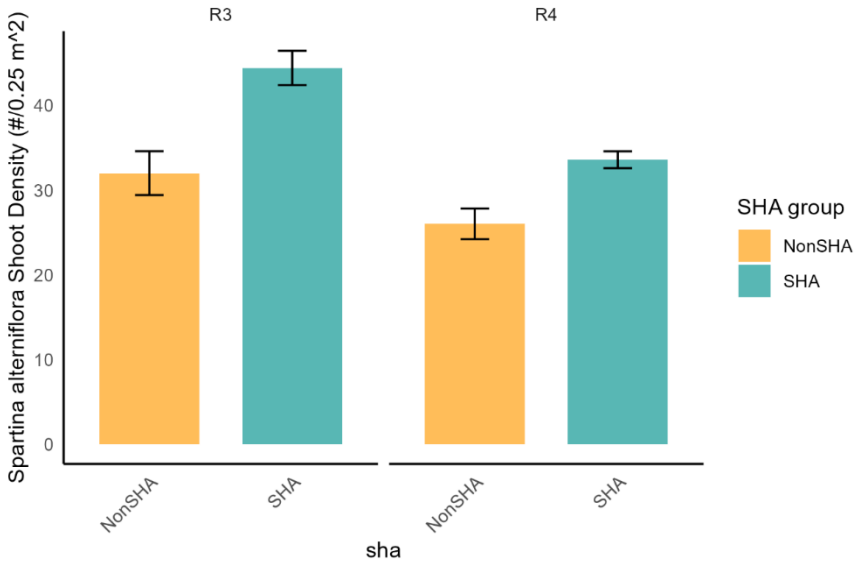


Figure 10. Spartina alterniflora shoot density (#/0.25 m^2) in Strategic Habitat Areas and reference sites. *Error bars represent ±1 standard error.*

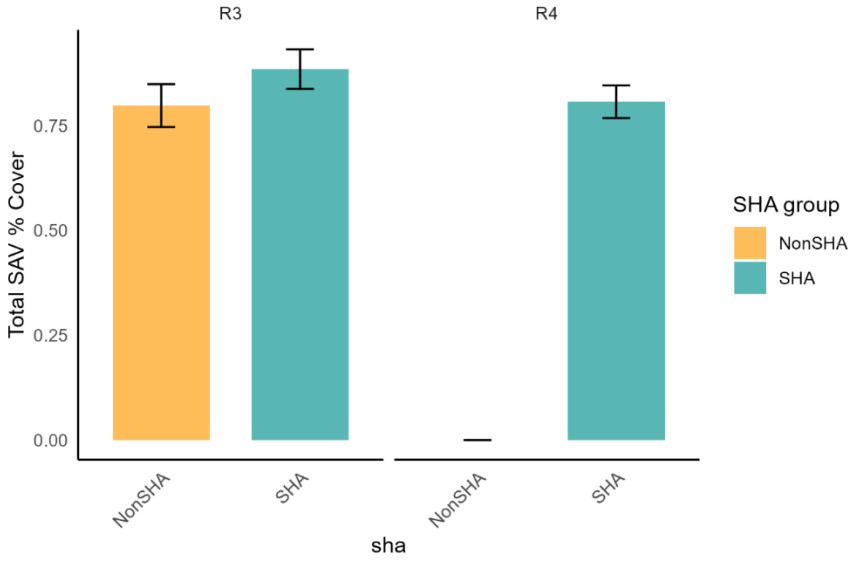


Figure 11. Percent cover of submerged aquatic vegetation in Strategic Habitat Areas and reference sites. Error bars represent ±1 standard error.

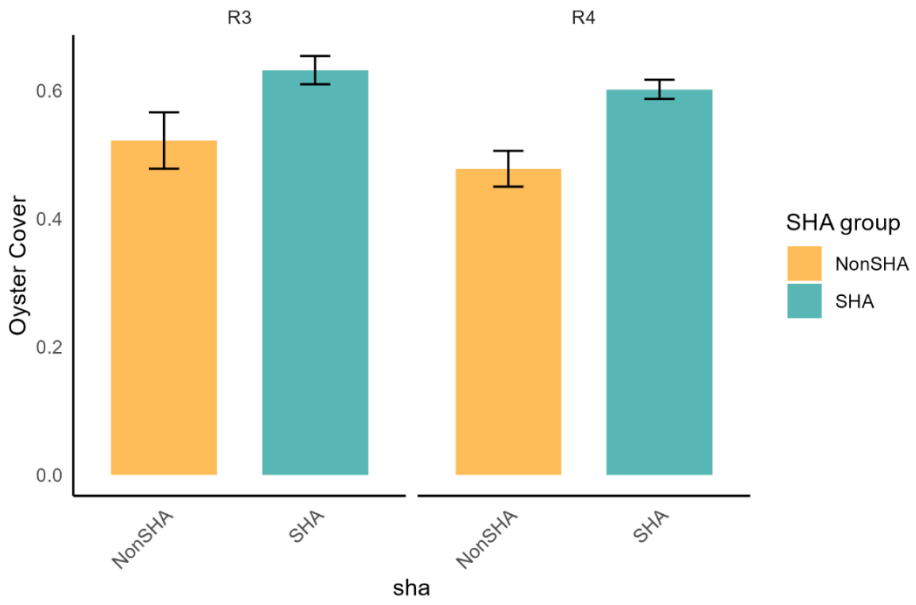


Figure 12. Percent cover of live oysters on oyster reefs in Strategic Habitat Areas and reference sites. Error bars represent ±1 standard error.

Nekton community

When examining the total multi-gear meal standardized catch, there were only differences between SHA and reference catch in Region 4 (Figure 13, $\chi^2(1) = 4.342$, $p = 0.037$). Strategic Habitat Areas had a higher abundance of nekton for mean-standardized catch as well as each individual gear. No statistical difference was found in the total abundance of nekton in Region 3 across all gear types ($\chi^2(1) = 1.113$, $p = 0.291$).

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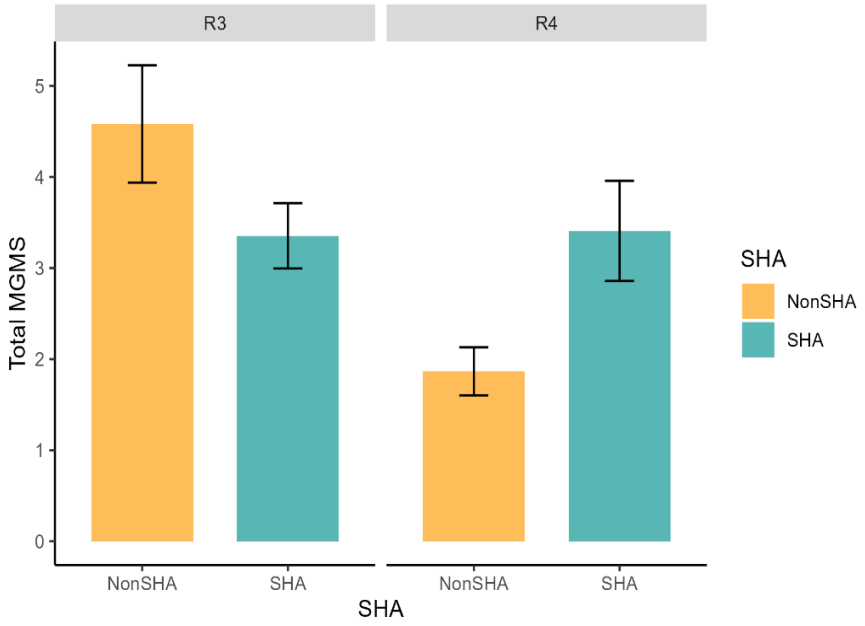


Figure 13. The total multi-gear mean standardization for Strategic Habitat Areas in Region 3 and 4. Error bars represent ±1 standard error.

Biodiversity

Overall, communities in SHAs had a higher species richness, and had a higher abundance of rare species. The difference in species richness was significant in Region 4 (Figure 14, $\chi^2(1) = 4.122$, $p = 0.042$). When examining the Shannon-Hill biodiversity of nekton measured in the multi-gear mean standardization index, there were no statistical differences between groups, but some patterns were present when examining each gear independently. When examining the trawl nekton, there was a higher diversity in the SHA sites than non-SHA reference sites ($\chi^2(1) = 4.324$, $p = 0.038$) in Region 3 (Figure 15). The opposite, however, was observed in Region 4, with higher diversity in the non-SHA sites than SHA sites ($\chi^2(1) = 5.418$, $p = 0.020$). No differences were found in Region 3 trap samples, but there was a higher diversity in SHA samples relative to diversity in the reference sites in Region 4 (Figure 16; $\chi^2(1) = 5.150$, $p = 0.023$).

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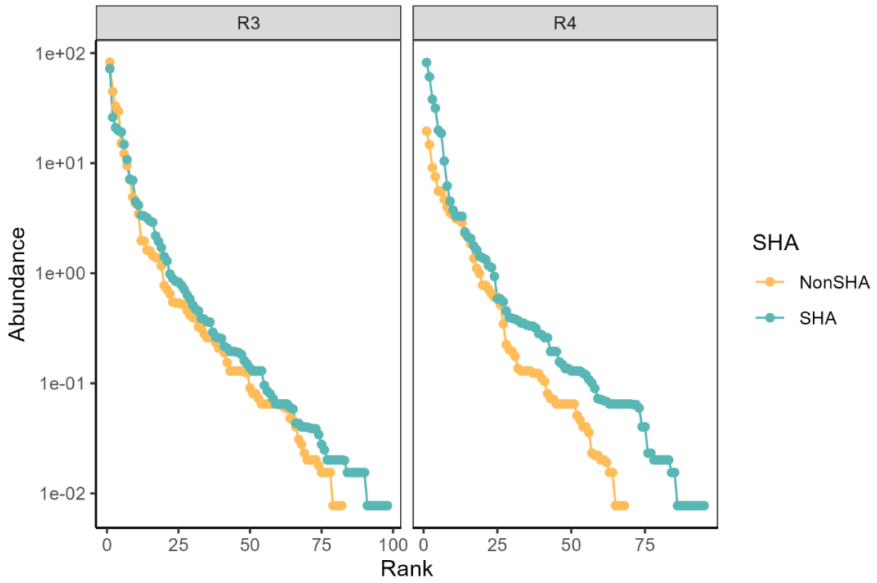


Figure 14. Species rank abundance curves for nekton multi-gear mean standardized catch in SHA and non-SHA sites in the White Oak (Region 3) and Cape Fear (Region 4) River regions.

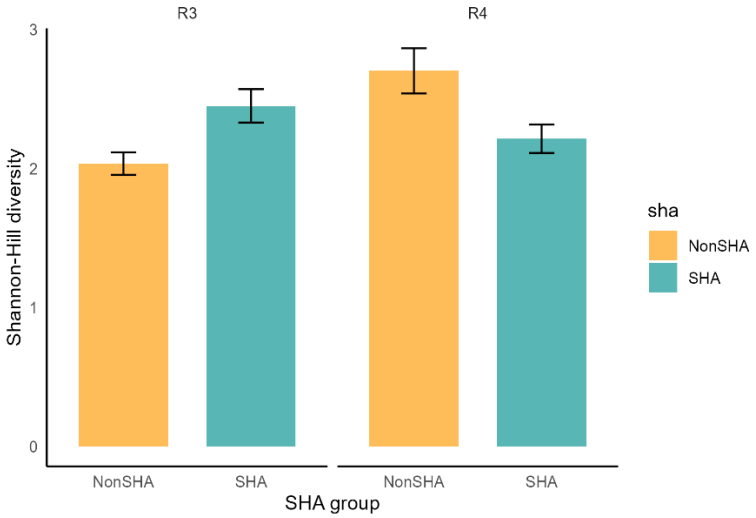


Figure 15. The Shannon-Hill Diversity index for nekton from trawl sampling in Strategic Habitat Areas and non-SHA reference sites. Error bars represent ±1 standard error.

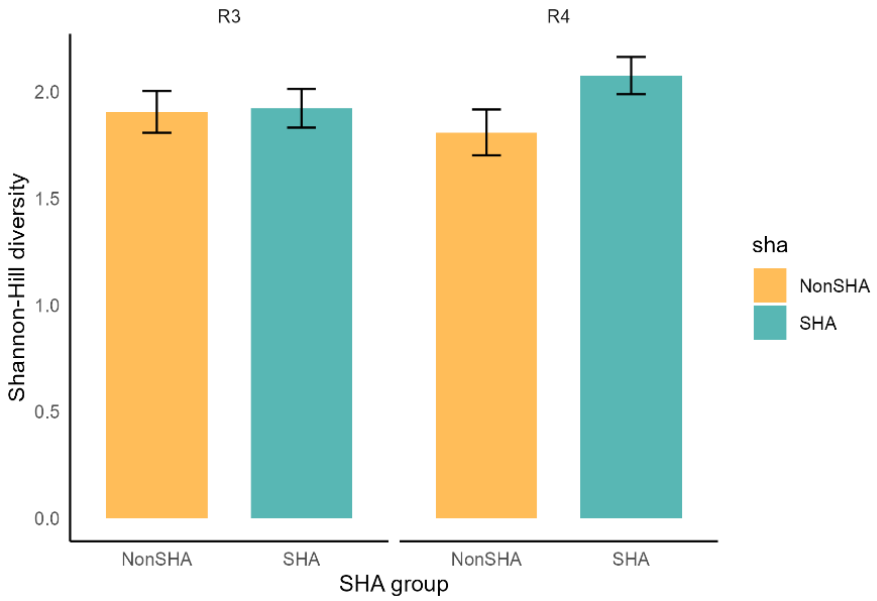


Figure 16. Shannon-Hill diversity index for nekton trap samples in Strategic Habitat Areas and non-SHA reference sites. Error bars represent ±1 standard error.

Community Analysis

Community analyses were not appropriate for the multi-gear mean standardization index or when examining most gear types due to high stress (stress > 0.2) and low squared correlation coefficient (r^2). The 2-dimensional NMDS of trawl catch per unit effort in both regions had an appropriate stress (Region 3 stress = 0.129, Region 4 stress = 0.110) and Region 3 trawl data had a significantly different community in SHA sites than reference sites (Figure 17, PERNAMOVA: Region 3 pseudo-F = 3.400, R^2 = 0.014, p = 0.014). Trawl community composition was not statically significant in Region 4 (pseudo-F = 1.767, R^2 = 0.008, p = 0.117).

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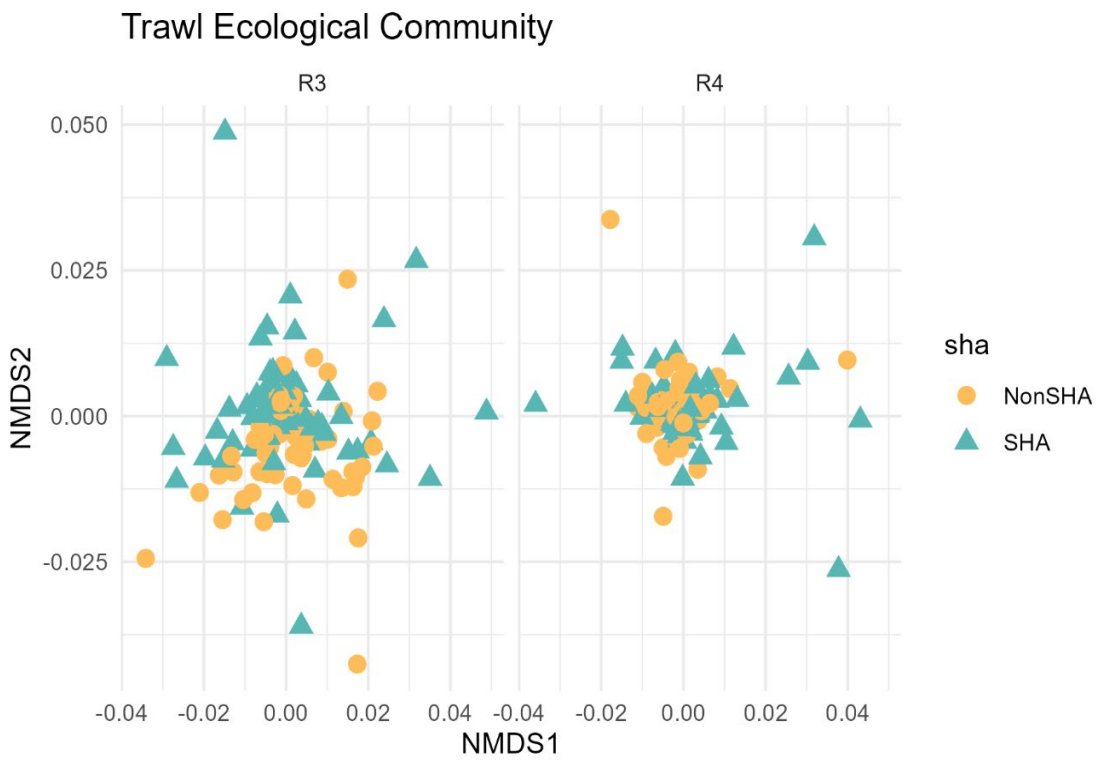


Figure 17. NMDS for community composition in trawl samples across Region 3 and 4 in SHA and non-SHA sites.

Alteration

Habitat alterations were observed more in non-SHA sites; however, frequency also varied between regions. Culverts were only found at one sampling location across both regions, in a non-SHA site in Region 3. There are no differences between the frequency of channeling at sites between treatments, but Region 4 was found to have higher channelization than Region 3. Region 4 also had higher frequency of bridges in non-SHA sites than SHA sites ($\chi^2(1) = 9.110$, $p = 0.003$).

Non-SHA sites had more eroded edge than SHAs. In Region 3, non-SHAs were overrepresented in the frequency of higher categories of eroded edge (26-50%, >50%) when compared to SHA sites (Figure 18, $\chi^2(1) = 66.908$, $p < 0.001$). In Region 4, the there was a marginal significance ($\chi^2(1) = 7.751$, $p = 0.051$), with significant pairwise comparisons only occurring at the 26-50% eroded category, with non-SHAs being overrepresented.

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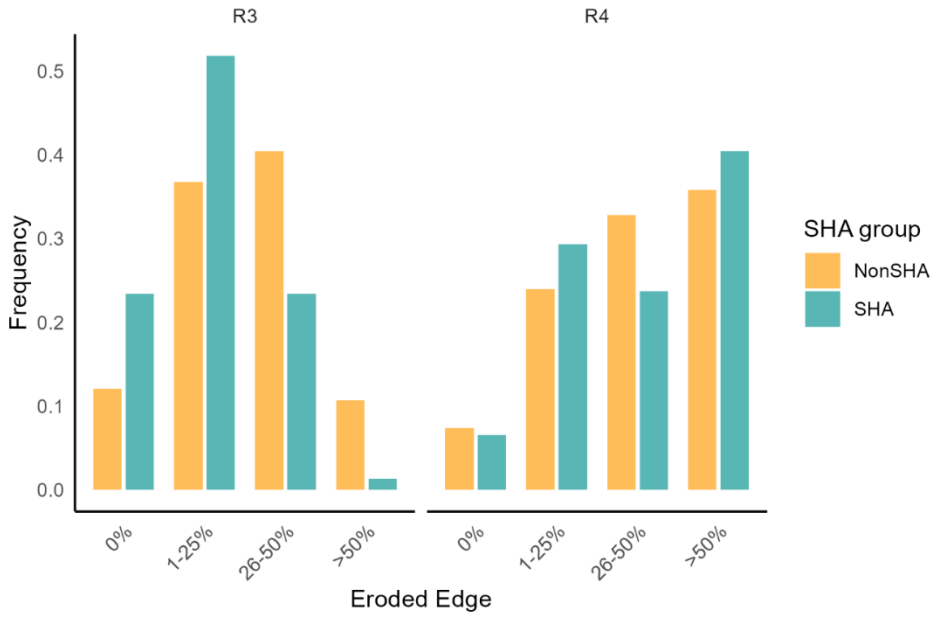


Figure 18. The frequency of SHA and non-SHA sites having 0%, 1-25%, 26-50%, and >50% eroded marsh edge.

SHAs had lower hardened shoreline scores than reference areas, but patterns depended on the region (Figure 19; Region 3, ($\chi^2(1) = 30.088$, $p < 0.001$; Region 4, ($\chi^2(1) = 75.477$, $p < 0.001$)). In Region 3, non-SHAs were overrepresented in sites that were over 50% hardened, while SHAs were overrepresented, but not significantly, in all categories 0-50%. In Region 4, pairwise comparisons were significant in the 10-25% hardened category with SHAs being overrepresented and in the >50% category with non-SHAs being overrepresented.

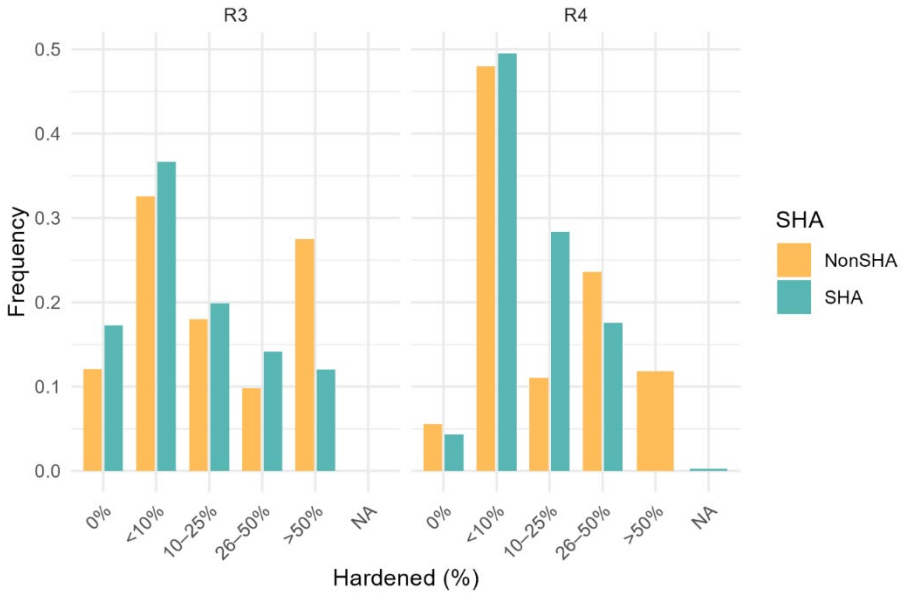


Figure 19. The frequency of SHA and non-SHA sites having 0%, 1-25%, 26-50%, and >50% hardened shorelines.

Conclusions

These results verify that the SHA designation process accurately selected areas with a greater extent of relatively unaltered, diverse habitats, with high ecological function. SHAs had a larger area of structured habitats than the reference sites as well as more habitats present in the landscape. SAV meadows were only present in SHA sites in Region 4. Habitat conditions within SHAs were also higher- salt marshes had higher *Spartina alterniflora* stem density and live oyster cover than the reference sites.

Strategic Habitat Areas were also less altered than reference sites. Reference areas outside of SHAs were more likely to have high levels of eroded marsh shoreline and more hardened shoreline present at sampling locations. Observations of manmade culverts and bridges were also lower in Strategic Habitat Areas, adding to the validation that areas nominated for SHAs were relatively unaltered.

The lack of difference between the total fish abundance in and outside of SHAs in Region 3 may be due to a combination of lower alteration level, smaller differences in habitat presence, and basin geography. Additionally, large catches of schooling species (e.g., spot, menhaden) may have limited differences in total catch. However, Strategic Habitat Areas in Region 3 did show evidence of higher biodiversity indices and different community composition in the trawl data.

Finally, Strategic Habitat Areas had higher nekton abundance and biodiversity in Region 4. This validates the initial goals of identifying areas that provide exceptional habitat function by supporting a higher abundance of diverse fish populations. In combination with findings that Strategic Habitat Areas have a more diverse estuarine landscape, a higher area of structured habitats, and less alteration than areas outside of SHAs, the results of this validation study lend further support to the designation of the nominated Strategic Habitat Areas.

Due to the high time and cost of this sampling program, DMF will explore using current independent sampling for validation of the remaining two regions. In Region 1, data from DMF Programs 100, 135, and 150 can be used, and for region 2, data can be pulled from DMF Programs 120, 915, 610, 611, and 195. Given the differences between the regions, additional factors or habitat characteristics may need to be measured. The complete analysis of validation for all regions will be presented in a future issue paper to the Marine Fisheries Commission that includes options for the designation of Strategic Habitat Areas.

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Strategic Habitat Area Management

Following validation of all regions, DMF will reconvene the internal SHA workgroup to develop management strategies. A workshop with state, federal, NGO, and academic partners will be held to prioritize and further develop ideas to protect strategic habitat areas. The leading management options from these discussions will be presented to the MFC and any other appropriate commissions in an issue paper(s). Since each SHA unit has different threats and alterations, a site-specific approach may be needed based on the area function and the severity of threats.

Strategic Habitat Areas can be used in conservation planning by federal, state, and local agencies. They could be added to the NC Conservation Planning Tool which identifies and prioritizes essential high quality natural resources required to maintain healthy and sustainable ecosystem (NC NHP 2025). When planning for sea level rise, marsh migration corridors upland or adjacent to SHAs should be prioritized in land acquisition (see 2021 CHPP Amendment, Chapter 5: *Wetland shoreline protection and enhancement with a focus on nature-based solutions*). SHAs could also be a ranking criterion for the Coastal and Estuarine Land Conservation Program (NC CELCP) plan.

Areas that remain relatively unaltered may need additional protection. SHA locations overlap with Deep Water Oyster Recovery Areas (DORAs: Oyster FMP, NCDMF 2025). DORAs prioritize the ecological value of oyster habitat and protect oyster habitat by prohibiting mechanical harvest. Reducing disturbance from harvest will allow oyster communities to have a higher relief and lower risk of total loss of live oysters during hypoxia events. Additionally, DORA closures have the benefit of providing a refuge for fish during these events. DORA closures in region 2 protecting 81% of identified deep water oyster habitat includes three nominated SHA areas (SHA 52, 86, 137 which are Swanquarter Bays, Neuse Mouse 1, Neuse Mouth 2, respectively).

Strategic Habitat Areas can be prioritized for restoration and enhancement. DMF should consider SHA units when selecting sites for restoration or enhancement when appropriate and prioritize projects that increase connectivity of habitats and SHA units. Funding programs that support enhancement and restoration of fish passage, hydrology, and habitats could also use Strategic Habitat Areas to as a ranking criterion for proposals.

SHA designation could be added to local land use plans, permitting guidance, and watershed planning to bridge marine conservation priorities and land-use decision making. Management actions may also include pursuing funding for agriculture cost-share programs to implement best management practices in watersheds draining to SHAs.

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General outreach to the public should include encouraging best management practices adjacent to SHAs.

Recommended Actions

1. Explore feasibility of using DMF independent sampling data to validate SHAs for Albemarle Sound and Pamlico Sound regions.
2. Develop an issue paper that presents validation of Strategic Habitat Areas statewide and propose designation options to the Marine Fisheries Commission.
3. Establish an internal working group to develop management options for Strategic Habitat Areas.
4. Conduct a workshop with federal, state, and private partners to further develop potential management strategies.
5. Complete a SHA management issue paper and present management options to the appropriate commissions and external partners.

Acknowledgements

Anne Deaton, Casey Knight, Yan Lee, field staff

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Thin Layer Placement (TLP)

Executive summary

North Carolina has approximately 235,000 acres of estuarine wetlands in its coastal waters, which provide essential nursery habitat for fish species, foraging and nesting sites for shorebirds and small mammals, shoreline stabilization and erosion control, and enhance water quality through nutrient and pollutant retention. However, those estuarine wetlands are increasingly threatened by sea level rise, saltwater intrusion, and erosion, and the 2021 CHPP called for expanding collaborations between state, federal, and private partners to protect and restore impacted wetlands through nature-based solutions. This CHPP builds on those 2021 CHPP recommendations by outlining the benefits, resource impacts, and policy and permitting concerns with thin-layer placement, which is a restoration, enhancement, and resilience strategy broadly defined as the application of sediments (primarily dredged material) to coastal wetlands in order to increase elevation and surface area, promote sediment accretion, and restore impaired habitat. During development of this CHPP, DEQ staff hosted a workshop to discuss thin layer placement and to share successes, challenges, concerns, and lessons learned associated with the ecological impacts of placing sediment on deteriorating wetlands, and feedback from staff attending the workshop was incorporated into this chapter of the CHPP. The information and guidance summarized in this chapter will serve as an additional resource for regulatory and resource agency staff, commission members, restoration practitioners, and researchers as additional thin layer placement projects are proposed in North Carolina.

Introduction

Preface

Thin layer placement (TLP) is a restoration, enhancement, and resilience strategy broadly defined as the intentional application of sediments (primarily dredged material) to coastal wetlands in order to increase elevation and surface area, promote sediment accretion, and restore impaired habitat. Further defined and described in Berkowitz et al. (2019), TLP is intended to maintain a natural mosaic of low- to high- wetland habitat and support associated ecosystem functions and plant and animal communities. TLP is often proposed for wetlands experiencing low sediment supply, subsidence, and erosion that subsequently have the inability to keep pace with sea level rise and / or do not have an adequate pathway for upland migration (Fig. 1). For the purpose of this document, TLP is viewed as a tool for enhancing the resilience of existing wetlands that are susceptible to or

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actively drowning and experiencing vegetation loss, interior ponding, and other deteriorating conditions. TLP is not viewed as a tool for the disposal of dredged material, for the creation of new wetlands, or for the mitigation of wetland impacts made elsewhere.

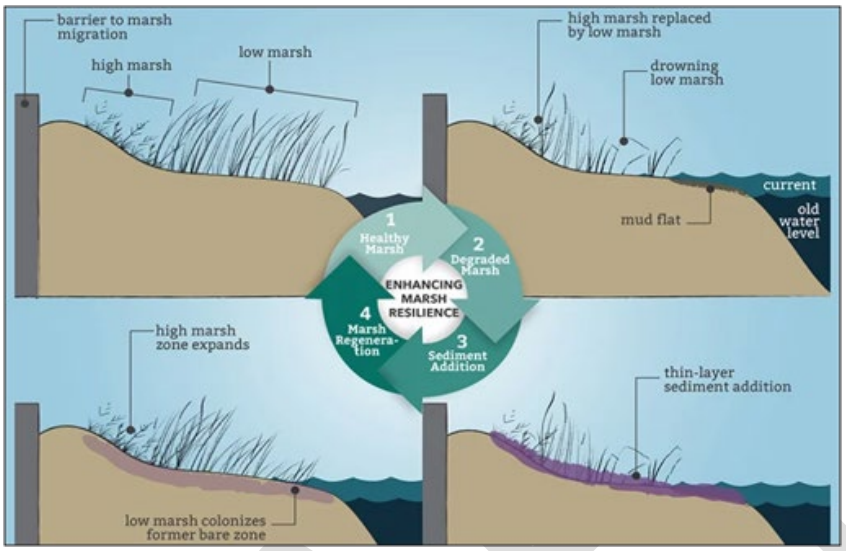


Fig. 1: Conceptual diagram of the thin layer placement process (Raposa et al. 2023).

In North Carolina, dredged material is typically disposed offshore, in upland spoil sites, or when appropriate, used for beach nourishment. However, there is growing nationwide interest in the Beneficial Use of Dredged Material (BUDM) for habitat restoration, including TLP and, while outside the scope of this document, other novel uses besides nourishment such as expanding estuarine shorelines and creating and enhancing islands and offshore artificial reefs. The 2021 CHPP amendment included preliminary discussions about TLP (see Chapter 5.3: Wetland Shoreline Protection and Enhancement with Focus on Nature-based Solutions) and recommended the development of parameters that could be used to evaluate the success of TLP in North Carolina (2021 CHPP Recommended Action 5.12).

CHPP staff, in consultation with the CHPP Steering Committee and coordinating agencies (NC Divisions of Coastal Management, Marine Fisheries, and Water Resources; Albemarle-Pamlico National Estuary Partnership; NC Coastal Reserve and National Estuarine Research Reserve), subsequently identified the need to include TLP as a priority issue for the 2026 CHPP amendment due to expressed interest and curiosity amongst several stakeholder groups including state and federal resource and regulatory agencies, landowners, conservation agencies, environmental non-profits, and local municipalities. For example, state and federal resource and regulatory agencies are interested in habitat trade-offs, resource impacts, permitting requirements, and project efficacy while landowners, municipalities, and environmental groups are interested in expanding options for restoring critical habitats that provide important ecologic and economic services.

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Including TLP as a priority issue for the 2026 CHPP amendment also aligns with several conservation and restoration initiatives described in the NC Division of Coastal Management 2022-2026 Estuarine Shoreline Strategy[1], NC Division of Water Resources 2021-2025 Wetland Program Plan[2], 2024 NC Salt Marsh Action Plan and 2026 Implementation Roadmap[3], and the Albemarle-Pamlico National Estuary Partnership 2025-2030 Comprehensive Conservation and Management Plan[4].

The Evolution of TLP

The disposal of dredged material in shallow estuarine environments historically involved side casting, or the simple movement of material "to the side" or away from a given project area, to create elevated intertidal berms that facilitated the recruitment of wetland vegetation but did not necessarily support any kind of ecological function. An early rudimentary study exploring the effects of placing dredged material onto a *Spartina alterniflora* salt marsh in Brunswick, Georgia showed that within one growing season, invertebrate communities recovered and plants were able to penetrate through up to approximately 20 cm of sediment (Reimold et al. 1978). Over the past several decades, TLP has primarily involved the hydraulic dredging, liquification, and pumping of sediments through a high-pressure spray nozzle. The resulting "slurry" is subsequently applied in a rain-like consistency over the surface of a recipient wetland (Fig. 2).

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[1]The 2022-2026 Estuarine Shoreline Strategy aims to explore the implementation of resilience strategies including thin layer placement and the protection of marsh migration pathways.
[2]The 2021-2025 Wetland Program Plan aims to determine status and trends in wetland acreage, condition, and functions while promoting statewide wetland restoration and protection.
[3]The 2024 Salt Marsh Action Plan and 2026 Implementation Roadmap aim to facilitate and advance salt marsh research and assessment to protect and restore existing salt marshes and improve salt marsh function, including the advancement of beneficial use tools.
[4]The 2025-2030 Comprehensive Conservation and Management Plan includes proposed actions that refine and implement regional wetland protection and restoration strategies by mapping, monitoring, and identifying critical habitats.



Fig. 2: Typical method used for thin layer placement (Image Source: U.S. Army Corps of Engineers)

TLP can also involve direct, low-pressure end-of-pipe discharge when slurry application is not feasible due to logistical or resource constraints. End-of-pipe discharge involves the distribution of sediment through passive sheet flow or the manual re-working of sediment over the wetland surface. While it can be successful (see Feigin et al. 2026), this approach often results in non-uniformity in sediment distribution because relative to fine sediments, coarser materials tend to drop out of suspension and form mounds near the discharge pipe (Davis et al. 2022; Whitbeck et al. 2019). Additionally, end-of-pipe discharge can scour the marsh surface and bury plants that are most proximate to the discharge pipe. Regardless of application method, TLP is often done in conjunction with shoreline stabilization measures (e.g., living shorelines, breakwaters, wave attenuators) that help retain material within the system. This topic is discussed further in subsequent sections.

2026 CHPP Objectives

The following sections are intended to provide a comprehensive review of existing literature (i.e., research studies and guidance documents) and large-scale case studies primarily along the east coast of the United States. This review will provide insight into lessons learned and best practices to consider for planning, implementing, and monitoring successful TLP projects. This paper will also highlight relevant TLP policies and regulations and the results from a multi-agency stakeholder workshop held on March 30, 2026 (Appendix B) that identified permitting and resource concerns, research and information needs, and knowledge gaps associated with the implementation of TLP in North Carolina.

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In North Carolina, TLP remains relatively unexplored at large scales relative to other states (e.g., Georgia, Maryland, Delaware, New Jersey, New England states) that have permitted and implemented TLP projects beyond the experimental stage (see more in "Eastern U.S. Case Studies"). TLP projects are currently ineligible for permitting under the North Carolina Coastal Area Management Act (CAMA) and Dredge and Fill Law but may be approved through a variance from the NC Coastal Resources Commission (further discussed in "Regulation, Policy, and Permitting"). The information summarized throughout this document build significantly on existing guidance developed by the North Carolina Division of Coastal Management (further discussed in "Guidance Document Review") and is therefore intended to serve as a source document for regulatory and resource agency staff, commission members, restoration practitioners, and researchers as TLP projects are proposed and considered for variance. Overall, this document will ensure stakeholders are well positioned to evaluate TLP proposals and if needed, help inform next regulatory steps as determined by the Coastal Resources Commission.

Further detailed in the "Looking Ahead" and "Specific Recommended Actions" sections, we recommend future work that evaluates potential candidate areas for TLP in North Carolina. We also recommend the development of a multi-agency TLP or beneficial use workgroup to move forward TLP efforts and, if warranted, establish best practices specific to the state. Overall, the information provided in this document highlights the growing trend of implementing novel beneficial use projects within coastal ecosystems that are susceptible to negative impacts from environmental change.

Abbreviated Primary Literature Review

Experimental research within the last 10-20 years has examined the impacts of TLP on coastal wetland function to determine optimal conditions for restoration success (see short reviews by VanZomeren and Piercy 2020 and Ray 2007). Recent work has broadly considered the importance and response of sediment characteristics and biogeochemistry, the thickness or amount of applied material, target elevation and change over time, the response and recovery of plant and animal communities, and long-term resilience to sea level rise and environmental change.

Sediment Characteristics

Comparing sediment characteristics between source materials and potential recipient wetlands is one of the most important considerations associated with TLP. Traditionally, compatible source material is that which shares similar physical and chemical properties (e.g., grain size, bulk density, organic matter content) as the recipient wetland to ensure normal ecological function (sometimes referred to as "like-on-like" application). At low

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elevations, tidal wetlands are typically characterized by anoxic, organic and nutrient-rich fine sediments (over 90% silt + clay) with low rates of decomposition. Wetland sediments are among the most productive on Earth and support high above and below ground biomass and facilitate the accumulation of and potential long-term storage of carbon. In North Carolina, compatible source material would most likely derive from the maintenance dredging of federal or private navigation channels, canals, and other large excavation projects (e.g., marina basins, etc.).

Some evidence suggests that material compatibility is not always important. For example, Raposa et al. (2023) and VanZomeren et al. (2018) have shown that the application of coarse sediments (i.e., sand and other terrestrial sources comprised of 75% sand and 25% silt + clay) on wetland surfaces is effective at maintaining biological productivity (i.e., the growth and survival of plant and invertebrate communities) while enhancing wetland elevation and preventing further sediment loss as long as a specific range of bulk densities (i.e., the degree of sediment compaction) is maintained to support the growth of target plant species. Further, the application of coarse sediments can sequester legacy contaminants[5] within recipient wetlands especially when amended with emerging activated carbon technologies (e.g., biochar, compost, etc.). These emerging technologies are designed to enhance the adsorption and retention of pollutants (Gilmour et al. 2018; Patmont et al. 2014) and ameliorate sulfide (a toxic metabolite) accumulation in sediments (Anchor QEA 2025), though these technologies can also increase soil respiration and methane emissions without subsidizing plant growth (Wilburn et al. 2024).

There may be other risks associated with material incompatibility. While "unlike-on-like" application can effectively maintain biological communities and surface elevation, it generally takes longer for recipient wetlands to return to ambient conditions (Harris et al. 2021; La Peyre et al. 2009). For example, the application of coarse sediments impacts sediment biogeochemistry and reduces rates of carbon accumulation because coarse sediments are more oxygenated and less rich in organic matter compared to fine sediments (Wilburn et al. 2024). A mismatch in sediment properties can therefore alter wetland ecosystem services and increase greenhouse gas emissions if there is a shift from anaerobic (without oxygen) carbon accumulation to aerobic (with oxygen) carbon decomposition. Additionally, the application of coarse sediments can impact ecological

[5]In North Carolina, the contamination of sediments with heavy metals, per- and polyfluoroalkyl substances (PFAS), and other degradation-resistant chemicals are a major concern associated with TLP and the beneficial use of dredged material especially within the Cape Fear region. Since the detection of high concentrations of PFAS in the Cape Fear River about a decade ago (Sun et al. 2016), these compounds have accumulated in a wide variety of organisms and environmental media (Ehsan et al. 2023). Any proposal to use dredged sediments for TLP would therefore have to undergo enhanced scrutiny to determine the concentration, distribution, and fate of PFAS and other contaminants within a given project area. These considerations are further outlined in the "Guidance Document Review" and Resource and Regulatory Concerns" sections of this paper.

interactions even if broad metrics used to describe plant and animal communities (e.g., diversity and abundance) do not change. The application of coarse sediments, for example, can promote crab burrowing and alter other invertebrate behaviors that extend beyond typical one-to-five-year monitoring periods (Raposa et al. 2023).

Sediment Processes and Biogeochemistry

Assuming "like-on-like" material application, recent work has shown that TLP typically preserves and can even enhance belowground biomass, microbial activities, and important biogeochemical functions (e.g., carbon and nitrogen retention) relative to other types of restoration (e.g., living shorelines and rip rap revetments to control edge erosion, native plantings to stabilize existing sediment, land acquisition to facilitate wetland migration, etc.) and to wetlands not subject to TLP. The application of new material to wetland surfaces introduces organic matter and nutrients that supplement sediment microbial communities and their metabolic processes (Bartolucci and Fulweiler 2026; Cornwell et al. 2025; VanZomeren et al. 2018) but increase the risk that sulfide and other dissolved gases accumulate (Berkowitz and VanZomeren 2020). However, these processes most likely respond to an initial "fertilization effect" and ultimately diminish in the long-term before returning to ambient, though sustained, conditions over time (Morris and Staver 2024). TLP can also help maintain the role of tidal wetlands as net greenhouse gas sinks, though some studies have reported variable but enhanced methane emissions even with "like-on-like" application (Bartolucci and Fulweiler 2024; Punchkoff and Lawrence 2022). The overall effects of TLP on sediment biogeochemistry are location-specific, highly variable, and represent an area needing additional research. There is also very limited understanding of how TLP impacts microbial interactions and long-term carbon and organic matter dynamics.

Placement Volume, Elevation, and Vegetation Response

It is important to note that TLP projects are associated with an "ugly phase" characterized by temporary wetland disturbance, plant smothering, and localized increases in turbidity. Approaches to minimizing any adverse impacts from construction activities are highlighted in subsequent sections and are discussed relative to necessary trade-offs and potential long-term benefits of properly executed TLP projects. While temporary impacts are inevitable during initial sediment placement, our review of existing literature mostly shows successful plant recovery and growth after one or two growing seasons with longer recovery times (up to four years) that are typically correlated with placement volume as discussed below (Fig. 3).

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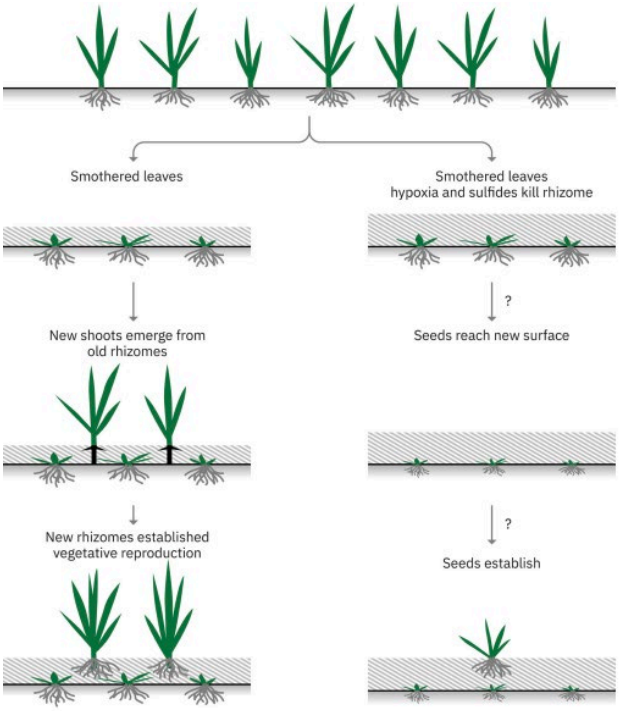


Fig. 3: Expected wetland vegetation recovery as a function of placement volume and thickness. Figure modified from Anchor QEA (2025) as adapted from Mohan et al. (2016) and Wilber and Engler (1993).

The response of wetland vegetation to sediment placement is partially dependent on the amount (volume) of material applied and may be the most important consideration and concern associated with TLP. The optimal amount or thickness of the applied sediment layer is highly project-specific and guided by the interaction between sediment characteristics, local tidal frames and resulting elevation-biomass relationships (Fig. 4; Raposa et al. 2023; Davis et al. 2022). For example, early studies in Louisiana by Schrift et al. (2008) and Slocum et al. (2005) used comprehensive multi-factorial treatment designs to test sediment applications along an elevation gradient and to compare results to control (equally degraded) and reference (goal or target condition) wetlands that received no sediment. Ultimately, the natural recovery and growth of native plant species was governed primarily by adequate tidal inundation, elevation gain, high organic matter content and bulk densities, and rhizome survival that were all sustained with sediment applications that ranged between 5-12 cm thick along the elevation gradient (Schrift et al. 2008; Slocum et al. 2005). TLP should therefore deliver enough sediment that achieves and maintains a target elevation within the intertidal zone, ideally near the mid-range between sea level and mean high water.

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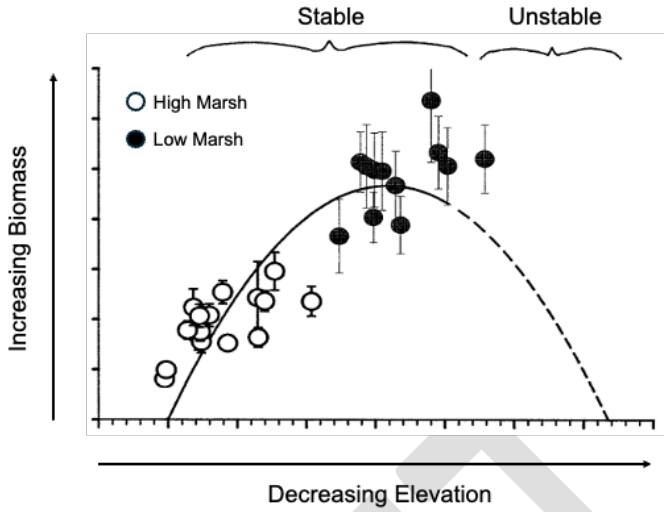


Fig. 4: The relationship between wetland elevation (horizontal axis) and plant biomass (vertical axis) within a typical *Spartina alterniflora* salt marsh. Open circles represent average measurements taken within high marsh sites while closed circles represent average measurements taken within low marsh sites. Vertical bars represent the error associated with each measurement. Overall, plant biomass peaks at certain elevations within the local tidal frame and decreases when elevation is too high (less tidal inundation) or too low (more tidal inundation or drowning). Figure modified from Morris et al. (2002) and adapted from NC DEQ (2025).

There are no absolute thresholds (e.g., 5, 10, 15 cm) that define TLP success, though previous work has demonstrated some trade-offs associated with a wide range of placement volumes and thicknesses relative to project goals and local hydrological characteristics (Appendix A). Generally, wetland vegetation and associated ecological functions recover more quickly the less material is applied, but this does not mean that longer recovery times associated with more material are indicative of unsuccessful projects. For example, Punchkoff and Lawrence (2022) and VanZomeren et al. (2018) showed that in Connecticut and New Jersey wetlands, respectively, sediment layers as thin as 5 cm increase above and belowground plant productivity and biomass, enhances carbon dioxide uptake, and reduces the potential for accumulating toxins and greenhouse gases in as little as six months. Raposa et al. (2023) showed that within a few years at several wetland sites across the National Estuarine Research Reserve System, 10 cm additions increased sediment accretion rates and elevation gain that were expected to withstand long-term subsidence compared to control sites. Stagg and Mendelssohn (2010) report similar successes with applications up to 36 cm in Louisiana wetlands. Regardless of placement thickness, plant recovery can be expedited by pre-seeding sediment slurries prior to application or with supplemental plantings after application. In some cases, 100% of post-application plantings can survive and either reach or exceed the richness and density of reference sites (Howard et al. 2020).

For projects that aim to maintain existing "low marsh" edges that sit at lower elevations within the tidal frame and less inundated "high marsh" interiors that sit at higher elevations

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within the tidal frame, low marshes tend to recover more quickly than high marshes regardless of placement thickness. Studies have generally shown a more positive initial response to TLP from wetlands dominated by low marsh plant species (e.g., *Spartina alterniflora*) compared to those dominated by *Spartina patens* or other higher marsh species (Raposa et al. 2023; Payne et al. 2021). Some studies also suggest that interior, low-elevation ponds within drowning wetlands might benefit the most from TLP (La Peyre et al. 2009; Mendelssohn and Kuhn 2003). However, the response to and recovery from TLP is most likely inconsistently reported across wetland elevations and species. For example, higher marsh species may simply take longer to reach similar metrics (e.g., biomass, stem density, etc.) as their lower marsh counterparts (Raposa et al. 2023). These results underscore the importance of evaluating TLP impacts on species besides *Spartina alterniflora* and establishing adequate monitoring timeframes.

Higher placement volume correlates with higher initial elevation gain and increases the likelihood that habitats convert between sub-tidal open water ponds, intertidal low and high marsh, and supratidal uplands that sit entirely above the tidal frame. For projects that aim to enhance long-term resilience to particularly high rates of sea level rise and wetland loss, habitat conversion associated with the application of large amounts of sediment could be a desirable outcome assuming created uplands eventually convert back to intertidal wetlands (Anchor QEA 2025). Habitat conversion may also be desirable to achieve project goals associated with the restoration of habitats specific to birds or other taxonomic groups. While TLP can be successful with a wide range of placement volumes, there are risks associated with over-application such as permanent smothering, over-compaction and elevation loss, excess turbidity and leakage, and lower plant productivity over time (Correll et al. 2024; Graham and Mendelssohn 2013). Elevating wetlands too high or above the appropriate tidal frame can also facilitate the colonization of invasive species such as the common reed *Phragmites australis* and reduce available fish habitat below mean high water. Additionally, final "as built" elevations are difficult to predict, particularly with issues associated with fine sediments such as excessive drainage, compaction or consolidation (Myszewski et al. 2017).

Faunal Community Response

Compared to plant communities, research investigating the response of faunal communities to TLP is sparse and primarily emphasizes the impacts of sediment placement on subtidal benthic communities. However, previous work has shown that intertidal benthic invertebrate communities (e.g., snails, crabs, worms, other epi- and in-fauna) recover at a rate that corresponds to placement thickness (Tong et al. 2013) and material compatibility (Wilber et al. 2006). That is, benthic faunal communities will recover

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more quickly the less material is applied through vertical or lateral migration from adjacent areas, particularly if fine sediment is applied to the wetland surface. While recovery rates are typically determined by calculating the abundance of individual species, overall community recovery (i.e., structure and function) is dependent on maintaining local hydrological and vegetation characteristics once sediment is applied to the wetland surface (Tong et al. 2013). For example, sediment applications that convert intertidal to supratidal environments can result in community shifts that favor more mobile, terrestrial invertebrates (McAtee et al. 2020; Wilber et al. 2006). Lastly, the response of nekton and avian communities to TLP is even less studied but is also predominantly dependent on changes to vegetation cover and elevation over time (NJ DEP 2023). Regardless of placement thickness, significant initial changes in faunal communities are expected but most likely temporary assuming projects are planned and implemented responsibly.

Natural Sediment Deposition and Horizontal Movement. Aside from artificial processes like TLP, wetlands susceptible to natural overwash, flooding, and associated sediment deposition events (e.g., hurricanes or inland storms) can build and sustain wetland elevation, plant growth and biological productivity even under moderate to high (up to 16 mm per year) sea level rise scenarios (Baustian and Mendelssohn 2018; Baustian and Mendelssohn 2015; Walters and Kirwan 2016; McKee and Cherry 2009). These same natural events can deposit too much sediment or, depending on additional factors such as wind, waves and flooding velocity, can significantly scour or erode wetland ecosystems (Walters and Kirwan 2016; Hill et al. 2020; Guntenspergen et al. 1995). Overall, the ability of natural events to provide long-term resilience to changing environmental conditions is unpredictable and highly dependent on the thickness and texture of deposited sediment, storm frequency and intensity, and resulting long-term changes in sediment accretion and organic matter accumulation.

Horizontal sediment movement and distribution is another important consideration when evaluating the impacts of TLP on wetland surfaces. For example, Ganju (2019) showed that higher marsh elevations are more susceptible to "slumping" (e.g., structural failure and subsequent decrease in elevation) or post-application erosion due to sediment redistribution. Additionally, the horizontal movement of sediments can impact adjacent habitats (e.g., shellfish beds, submerged aquatic vegetation, etc.) especially if TLP projects do not incorporate erosion control measures during and after sediment placement. Impacts to adjacent habitats are localized, however, and the long-range export of material is unlikely (Thorne et al. 2019). Nonetheless, the significance of localized impacts can be reduced by placing sediments in less sensitive habitats (e.g., avoiding nursery areas, submerged aquatic vegetation, active shell fishing or high-quality waters, etc.) or areas within larger marsh systems. TLP can also be coupled with other nature-based strategies

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(e.g., living shorelines) to develop a more holistic restoration approach that incorporates the protection of adjacent habitats.

Long-Term Resilience

There is general consensus that TLP is an effective tool for mitigating wetland loss (Morris and Staver 2024). However, the amount of time TLP protects wetlands from further deterioration is determined by placement thickness, the number of repeated applications, and existing environmental conditions. Recent work has shown that over time, wetlands in North Carolina that received just one sediment application continued to build elevation compared to those that did not receive sediment and expedited the rate at which wetlands reached an elevation that could otherwise take decades to achieve (Davis et al. 2022). As another example, TLP efforts in Rhode Island provided a recipient wetland with an estimated 67–320 years of ambient elevation gain and subsequently with long-term resilience to environmental change (Raposa et al. 2022).

Most of the studies described in previous sections are based on relatively short-term impacts and monitoring data that only lasted a few years. Longer studies over five years indicate that while ecosystem function remains stable over time, recipient wetlands can still deviate from baseline or control conditions (Cheng et al. 2025). Further, modelling studies have shown that Virginia wetlands subject to TLP will not retain elevation capital or provide long-term protection against particularly high rates of sea level rise (over 15 mm per year), though increased resilience is more likely with wetlands characterized by existing, gently sloping migration corridors without physical barriers (e.g., bulkheads or other infrastructure) to migration (Barksdale et al. 2026). Overall, the extent to which TLP contributes to long-term wetland resilience most likely varies by geographic location and is dependent on a suite of project-specific factors and objectives. This degree of uncertainty underscores the need for large scale pilot studies across diverse wetland types, some of which are described in subsequent sections.

Eastern U.S. Case Studies

Some of the earliest "slurry" applications of TLP were conducted in Mississippi River Delta wetlands. While initial applications were considered disposal, the region began to leverage dredge projects for wetland restoration in response to rapid sea level rise and sediment deficits that prevented wetlands from maintaining or gaining elevation. Hence, early work along the U.S. Gulf Coast aimed to find the balance between disposal and beneficial use by determining the amount of material placed on wetland surfaces that would limit negative impacts to the ecosystem (Ford et al. 1999; DeLaune et al. 1990; Cahoon and Cowan 1988). For the purpose of this document, we emphasize recent studies conducted along

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the east coast of the United States and within wetland ecosystems (tidal freshwater to salt marshes) subject to tidal patterns similar to those found in North Carolina. However, additional studies along the U.S. west and Gulf coasts are summarized in Appendix A.

Eastern U.S. states are at various stages of implementing large-scale TLP projects (Fig. 5). For example, North Carolina, South Carolina, and Virginia are currently in the exploratory phase and have no regulatory pathway for TLP with limited (if any) experimental studies. Georgia, Maryland, and Delaware have successfully conducted few large-scale TLP projects, though the planning, permitting and implementation processes are not yet streamlined, and quantified monitoring results are rarely reported. New England states such as Rhode Island, Connecticut, Massachusetts, and New York also have limited success with TLP projects, the results of which are sparsely reported in primary or gray literature. Based on our review, New Jersey has established perhaps the most robust beneficial use regulatory framework (to include TLP) that extends beyond the pilot stage. The state has developed a programmatic approach to beneficial use that includes collaborations between regulators, dredgers, and landowners that begin with engaging new policies that first and foremost address environmental needs that are also of value to dredgers. Establishing buy-in is therefore a crucial pillar amongst stakeholders. While developing a catch-all approach (relative to a case-by-case approach) to TLP and beneficial use might streamline project development and implementation, it may not always generate desirable outcomes. Case studies from each of these states are summarized below.

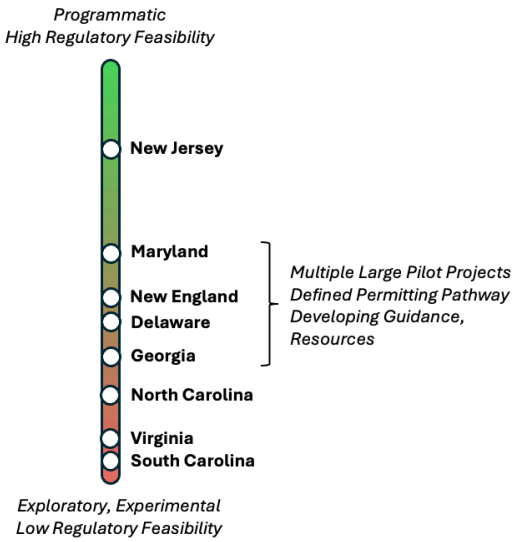


Fig. 5: Eastern U.S. states and their relative position along the TLP implementation spectrum as subjectively determined based on a review of regulatory feasibility, number and scale of reported TLP projects, and available TLP and beneficial use resources.

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North Carolina

Studies specific to North Carolina have been relatively limited, small-scale, and strictly experimental (Fig. 6). Wilber et al. (1992) first evaluated impacts of sediment placement (1-20 cm) on Gull Rock in Hyde County and found that recipient wetlands remained well-vegetated, albeit less dense, and that while resulting sediment properties (e.g., higher bulk density and lower organic matter content) differed from reference sites, faunal distributions (i.e., peracarid crustaceans, oligochaetes, and polychaetes) and cursory sampling of large mobile macroinvertebrates and fishes were indicative of productive wetlands. This study also highlighted the uncertainty associated with the effects of pre-application conditions on post-application results. For example, differences in sediment and vegetation characteristics could have resulted from differences in initial concentrations, biomass, susceptibility to disturbances, etc. that are difficult to realize without standardizing monitoring criteria.

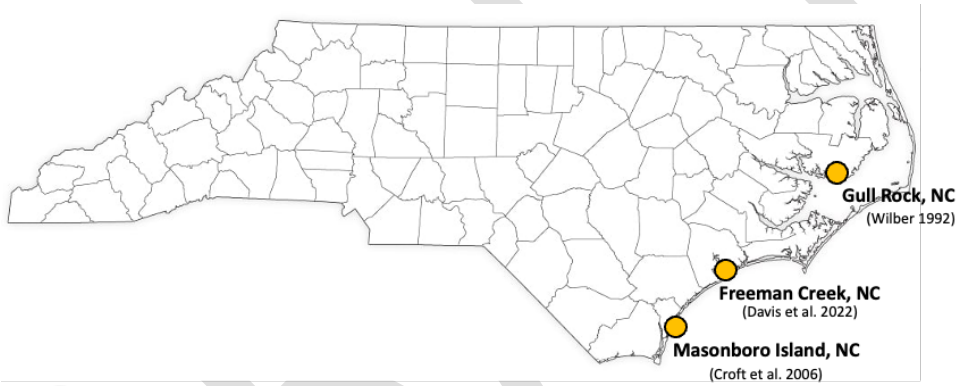


Fig. 6: Experimental (plot level) thin layer placement studies conducted in North Carolina.

On Masonboro Island in New Hanover County, the placement of fine sediments (2.5-10 cm thick) had a positive effect on deteriorating marsh plots after two growing seasons by increasing plant density and with sediment properties returning to pre-application conditions (Croft et al. 2006). However, there was evidence that placement increased the mobility and degradability of wetland sediments especially with thicker (near 10 cm) applications. Faunal response to sediment placement was also highly variable. At Freeman Creek in Camp Lejeune, Onslow County, Davis et al. (2022) reported positive gains (approximately 6 cm) in elevation and vegetative biomass that were maintained over five growing seasons. These net gains exceeded control sites.

Georgia

In addition to the early study conducted by Reimold et al. (1978) previously described, Georgia has conducted two more recent large-scale TLP pilot projects. In 2019, the Georgia

Department of Natural Resources in collaboration with the Georgia Federal Consistency Program, the U.S. Army Corps of Engineers, The Nature Conservancy, and Jekyll Island Authority placed approximately 5,000 cubic yards of sediment 15-25 cm thick over five acres of healthy *Spartina alterniflora* wetlands to increase wetland resilience to sea level rise (Appendix B; https://coastalgadnr.org/JekyllCreek). After five years, 84% of vegetation had regrown with most success at the wetland edge (Fig. 7). However, re-vegetation took longer than anticipated and did not support the vision of full re-growth between 3-5 years. Benthic species diversity decreased, and there was no evidence that the placement site met reference site conditions. Overall, project partners highlighted that monitoring could have been improved but was limited due to funding constraints.



Fig. 7: Wetland vegetation growth (2019-2023) following thin layer placement on Jekyll Island, Georgia. Image courtesy of the GA Department of Natural Resources (https://coastalgadnr.org/JekyllCreek).

A TLP project conducted in Brunswick, Georgia with robust engineering considerations yielded more success (Mohan et al. 2021). In this study, sediments (a combination of sand and silt) up to 30 cm thick were hydraulically conveyed onto degraded wetlands at an angle (between 30 and 45 degrees) that ensured uniform distribution of sediments across the wetland surface. While coarse sediments distributed more evenly than fine sediments, project partners were able to optimize the placement of fine sediments with a baffle plate and temporary access road within the marsh to control the location of the discharge pipe. While the inclusion of an access road optimized placement, it resulted in additional environmental impacts that required post-project restoration. However, physical and vegetative monitoring conducted over a two-year period indicated strong natural recolonization of vegetation and the re-establishment of benthic invertebrate species.

New Jersey

Several TLP pilot projects have been implemented within the barrier island sounds and Delaware Bay regions of New Jersey (Harris et al. 2025; NJ DEP and TNC 2023; Harris et al. 2021; VanZomeren et al. 2018). In summary, up to approximately 80 cm of dredged material was placed on degrading wetlands within these regions to increase and maintain optimal tidal elevations for native wetland species (particularly *Spartina patens*), increase the cover and health of native wetland vegetation, and return all other metrics to baseline conditions unless changes were expected from habitat conversion. An assessment of short-term impacts revealed that while recipient wetlands quickly recovered ecosystem services associated with biochemistry, water quality, and nutrient retention, placement sites experienced initial plant smothering, weaker sediment strengths, and subsidence from over-compaction. Some revegetation (more than 50%) occurred after three growing seasons and matched control sites, but not with the target species. Subsequent longer-term monitoring revealed that gradual improvements in sediment properties and vegetation growth were accompanied by elevation gains estimated to offset impacts from sea level rise by 18-28 years. However, these projects collectively resulted in uneven sediment distribution, variable rates and success in invertebrate, avian, and nekton recovery, and difficulty in detecting small elevation changes even after ten years. Overall, these results may not represent the most desirable outcome and underscore the need for detailed planning and design phases. Elsewhere in the state, TLP has been successful when coupled with hydrological restoration to restore wetlands to regularly flooded elevations that facilitate and maintain the rapid recovery of *Spartina alterniflora* (Feigin et al. 2026).

Delaware

While the state has few reported case studies, the Delaware Department of Natural Resources and Environmental Control conducted a TLP project in Pepper Creek, Sussex County within a low elevation wetland system situated adjacent to both a dredging project and adjacent higher elevation reference wetlands (DNREC 2016). This project involved the hydraulic dredging and placement of approximately 35,000 cubic yards of sediment up to 15 cm thick. While project results were not quantified, project partners reported elevation gains and successful revegetation.

Maryland

Early TLP efforts in Maryland were experimental and part of a long-term climate adaptation strategy associated with the Blackwater National Wildlife Refuge and in collaboration with The Conservation Fund, Audubon Mayland-DC, the U.S. Fish and Wildlife Service, and the Maryland Department of Natural Resources (McCullough et al. 2021; Whitbeck et al. 2019). This project involved predictive and suitability modelling to implement the first TLP project

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in the Chesapeake Bay region. In summary, approximately 26,000 cubic yards of dredged sediment up to 15 cm thick were applied over 40 acres of a subsiding and fragmented wetland comprised of *Spartina alterniflora, Spartina patens,* and the bulrush *Schoenoplectus americanus* with the goal to create higher elevation wetlands for the saltmarsh sparrow *Ammodramus caudacutus* and to increase wetland resiliency to sea level rise and storm impacts. While project partners observed significant revegetation and recolonization of wetland bird species, the proliferation of invasive *Phragmites australis* remained a long-term problem.

In 2024, the National Oceanic and Atmospheric Administration in collaboration with the U.S. Fish and Wildlife Service and the U.S. Army Corps of Engineers conducted a large-scale TLP pilot study at Deal Island Wildlife Management Area (Fig. 8). This project involved the application of 167,000 cubic yards of material up to 46 cm thick over 72 acres of low wetland habitat. Sediment placement was accompanied by straw bales to contain material and supplemental plantings over two growing seasons. Overall, the project was effective at restoring densely vegetated habitat but took several years to reach equilibrium. The project also required re-plantings and the installation of new straw bales over time to ensure long-term success (Davis et al. 2025; Appendix B)



Fig. 8: Wetland vegetation growth (2024-2025) following thin layer placement at Deal Island Wildlife Management Area. Image courtesy of Dr. Jenny Davis, NOAA (Appendix B).

New England

Relative to the southeast, northeast U.S. marshes are generally less productive in terms of plant biomass, positioned higher in the tidal frame, and experience larger tidal ranges and lower relative rates of sea level rise. As a result, New England wetlands generally respond to TLP more quickly (and with less material) relative to southeast and mid-Atlantic U.S. wetlands. For example, pilot studies in wetlands across Connecticut, Rhode Island, New Hampshire, and Massachusetts have shown that sediment layers between just 5-10 cm promoted rapid revegetation, enhanced carbon dioxide uptake, and reduced methane emissions (Punchkoff and Lawrence 2022; Payne et al. 2021). However, larger placement

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volumes up to 48 cm thick have also been shown to build elevation capital without compromising the recovery of plant and animal communities in sandier microtidal regions of New England (Raposa et al. 2022).

TLP projects have also been implemented in urban New York wetlands. For example, the deepening of New York Harbor yielded 42 million cubic yards of material between 2004 and 2014, a portion of which was used beneficially within the Jamaica Bay region. One of the larger-scale TLP projects was conducted within a barren, non-vegetated mudflat which received supplemental plantings and 8,000 cubic yards of sediment an average of 20 cm but up to 100 cm thick. Like many other projects across the U.S. east coast, *Spartina alterniflora* and associated wetland ecosystem services recovered quickly with less material but eroded and did not recover with applications over 20 cm thick (Frame et al. 2005). More calculated efforts in recent years suggest that low elevation urban wetlands receiving no more than 15 cm of sediment recover to nearly 100% of reference conditions (i.e., based on percent cover and stem height) after two growing seasons, though restored higher elevation wetlands take longer to respond (Haight et al. 2026).

Guidance Document Review

In response to the growing number of peer-reviewed studies and pilot projects, several agencies and organizations have developed TLP guidance documents including the U.S. Army Corps of Engineers (USACE) and Fish and Wildlife Service (USFWS), National Estuarine Research Reserve System (NERRS), National Oceanic and Atmospheric Administration (NOAA), The Nature Conservancy (TNC), and other consulting, engineering, and research groups such as the Southeast Regional Partnership for Planning and Sustainability and the Georgia Coastal Research Council. In 2022, the North Carolina Division of Coastal Management in partnership with the Divisions of Marine Fisheries, Water Resources, and Wildlife Resources Commission and the USACE (Wilmington District), USFWS (Raleigh Field Office), and NOAA National Marine Fisheries Service (Southeast Regional Office) developed guidance for site assessment and monitoring of TLP in North Carolina (NC DCM 2022). This guidance was intended to help permit applicants design TLP projects in a way that optimized project scoping, interagency permitting reviews, and future outcome evaluations and provided a starting point for progressing TLP in the state. This and other documents are summarized below and highlight lessons learned and best practices for designing, implementing, monitoring, and adaptively managing large scale TLP projects informed by research and case studies like those described above (Fig. 9). These guidance documents also discuss important logistical, engineering, and funding considerations.

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Fig. 9: Process flowchart for thin layer placement. Figure modified from Anchor QEA (2025) and adapted from Piercy et al. (2023).

Planning and Design

Planning and designing TLP projects require a diverse interdisciplinary team of local, state, and federal stakeholders consisting of resource agencies; regulatory and permitting agencies; restoration practitioners; research scientists; landowners; dredgers, engineers, and consulting agencies; and fishers and recreationists. This team should be charged with identifying suitable wetlands for TLP, determining target elevations[6], and developing quantifiable objectives, success criteria, and associated monitoring and adaptive management plans (discussed further in subsequent sections). Example objectives are provided below:

- Restore a certain area (e.g., 50 acres) of bare, drowned wetland with enough sediment to re-establish dense wetland vegetation (e.g., 80% plant cover)
- Raise an entire wetland system by a pre-determined elevation (e.g., 10 cm) to facilitate sediment accretion (e.g., 3 cm per year for five years)
- Provide enough resilience for a pre-determined number of years or sea level rise scenario (at least 10 years is recommended by Anchor QEA 2025)

[6]Target elevations should be identified for both construction and post-construction TLP phases to account for fluctuations in wetland surface elevation after placement. Project teams should also establish a range of acceptable outcomes given potential differences in "as-built" versus designed wetland elevations that result from uncertainties in the absolute volume of material that is contained or lost post-application.

An alternatives analysis that includes the "no action" alternative should be conducted to ensure that TLP is the most effective long-term solution for achieving project objectives while recognizing and accepting trade-offs associated with the conversion between subtidal, intertidal, and supratidal habitats (discussed in further detail under "Resource and Regulatory Concerns"). For example, facilitating natural marsh migration without TLP may be most appropriate and cost-effective in areas with adequate natural sediment supply and migration corridors[7]. Additionally, wetlands subject to erosive conditions stemming from high energy wave impacts rather than subsidence, inadequate sediment supply, or rising sea levels may benefit more from erosion control structures such as breakwaters or wave attenuators rather than TLP. In other cases, historically modified wetlands (e.g., from impoundments, ditching, damming, etc.), especially those in microtidal regions, likely benefit most from hydrological interventions that restore ambient flow conditions and facilitate sediment deposition, accretion, and overall ecosystem function.

Appropriate site selection is important for satisfying project objectives and success criteria (Fig. 10). Aside from selecting degraded wetlands[8] with compatible sediment properties as discussed previously, wetlands with short fetch, large tidal ranges, ample migration area, and gradual slopes (1-3%) are generally exposed to less wave energy and are more likely to retain and accrete sediment. In this case, fine sediment placement is most appropriate and suitable (Myszewski et al. 2017). Wetlands with long fetch and steep slopes are more susceptible to sediment loss and may benefit most from coarse sediment placement. Site selection is also driven by matching dredge projects (and availability of source material) with recipient wetlands that meet restoration needs, are in close proximity to each other, and are financially and logistically feasible. TLP projects are predominantly executed in partnership with the U.S. Army Corps of Engineers due to their existing contracting resources and capacity to dredge large volumes of compatible material. However, smaller projects can be achievable with private excavation companies. In some cases, piloting TLP projects on public or state and federally managed lands can streamline project coordination and permitting (Hametz et al. 2025). Regardless of the site selected, nearby

[7]In North Carolina, for example, a highly developed region with many barriers to natural marsh migration (e.g., New Hanover County) may not benefit from TLP as much in the long-term compared to scarcely developed regions with higher migration potential (e.g. Hyde County). On the other hand, more developed regions could benefit more in the short term from TLP since options to enhance regional wetland resilience through facilitating wetland migration are limited.

[8] Stakeholders that participated in the NC DEQ multi-agency stakeholder workshop (hereafter referred to as "TLP workshop") indicated that identifying "degraded" wetlands may not be the most effective way to determine whether a site is a good candidate for TLP. Instead, practitioners should consider wetlands that are "at risk" of vegetation loss and ponding while also accounting for factors such as a site's proximity to existing infrastructure, the proposed dredge area and established migration corridors. North Carolina stakeholders also believe that just because a marsh is near a dredge area does not automatically make it a good candidate for TLP.

wetlands that do not receive sediment should be used as controls (i.e., an equally degraded wetland) and references (i.e., a goal or target) to evaluate project performance.

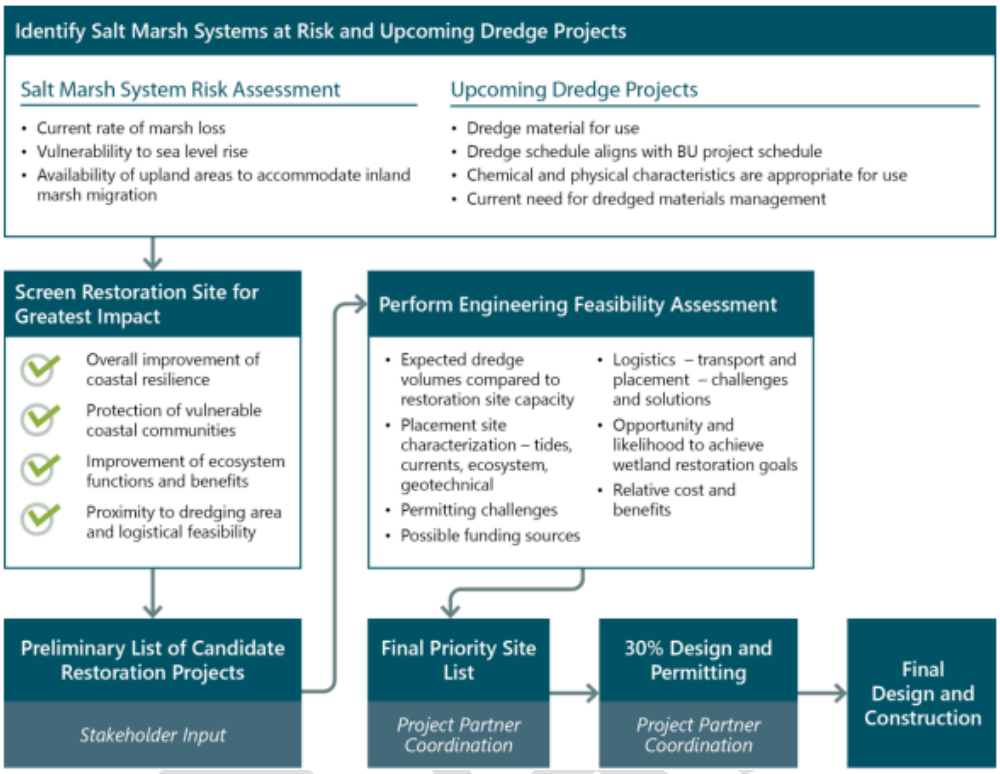


Fig. 10: Design process for thin layer placement. Figure adapted from Anchor QEA (2025).

Once all sites are selected (source, recipient, control, reference), geotechnical analyses are needed to evaluate baseline conditions and ensure material compatibility. Metrics might include grain size, bulk density, porosity, permeability, organic matter and nutrient content, dissolved oxygen, trace metals, contaminants, redox (metabolic) potential, composition and abundance of benthic invertebrate communities, or others mutually agreed upon by project partners or those required by permitting or resource agencies. Existing guidance also unanimously recommends a baseline understanding of local hydrological characteristics (e.g., wave conditions, flow velocities, currents, tides, and water levels) to help determine and achieve target elevations. Depending on funding and available resources, hydrological studies can involve high resolution numerical modelling (e.g., the Mid-Atlantic Tidal Wetland Rapid Assessment Method and other predictive sedimentological models) or coarser remote sensing technologies such as Light Detection and Ranging (LiDAR) coupled with *in situ* transect surveys that use surface elevation tables, marker horizons, tide and wave gauges, and real time kinematic global position systems (RTK-GPS).

While TLP project designs are iterative and progress through conceptual, preliminary, and intermediate stages, near-final plans should include a defined TLP work cell with a built-in buffer zone for added flexibility in placement location, staging and access, pipeline crossings, the construction of erosion control and sediment containment structures, and avoiding impacts to adjacent habitats outside the work cell (Hametz et al. 2025). Work cells should also be sited an adequate distance from tidal channels or wetland edges to increase the likelihood that sediment is deposited and contained on top of the wetland surface platform (Piercy et al. 2023). Based on existing guidance, the most effective TLP designs reduce complexity by minimizing the number of placement areas within a single work cell, the number of individual containment structures, and the number of discharge and dewatering points. Basic metrics specific to engineering and construction are described below under "Implementation."

Lastly, the planning and design phases for TLP projects require a cost assessment to ensure that equipment, resources, and personnel are available for all construction activities and post-construction monitoring and adaptive management needs (Table 1). Establishing reliable long-term funding sources is therefore critical for successfully implementing TLP and other beneficial use projects. Correll et al. (2024), for example, suggest leveraging annual calls for federal grant applications intended to fund large-scale restoration projects under a phased approach (e.g., decoupling planning and design, construction and implementation, and monitoring and adaptive management) to help guarantee multiple years of funding. Otherwise, continuous funding is dependent on local and state regulatory commitments or legislation.

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Table 1: Cost considerations for thin layer placement projects. Table adapted from Anchor QEA (2025).

Cost Items	Supporting Elements
Mobilization and Demobilization	• All costs to mobilize and demobilize equipment, material, and labor to the project site • Proof of insurance • Removal of temporary containment structures • Surveys of pre-construction conditions and post-construction conditions • Project Management
Submittals	• Pre-work submittals • Health and safety plans • Work plans • Cost breakdown • Baseline schedule and schedule updates • Daily/weekly/monthly reports • Maintenance and monitoring plan • Quality assurance plan
Site Preparation	• Preparatory grading • Construction of access roadways • Preparation of staging areas, material transfer areas, or slurry equipment • Erosion and sediment control measures • Temporary containment structures • Temporary warning signs
Dredging and Sediment Placement	• Dredge type (cutterhead, hopper, etc.) and application method (high or low pressure; slurry or end-of-pipe discharge) • Pipeline configuration and transportation distance[9] • Containment structures • Magnitudes of estimated quantities, units, and costs understood to have little uncertainty and are incorporated into construction bid schedule • Excluding change orders, construction cost estimate should be highly accurate with respect to final construction cost
Debris Removal and Disposal	• Tonnage of debris removed from the dredging template
Vegetation Establishment	• All labor, material, and equipment for vegetation re-establishment, including plugs, seeds, plants, soil preparation, staking, goose protection netting, etc. • Acceptable variance for initial acceptance of vegetation establishment
Monitoring and Maintenance	• Monitoring equipment such as settlement plates, grade stakes, etc. • Surveys, data collection, and reporting for monitoring and permit compliance • Re-establishment of vegetation • Regrading, if necessary

Implementation

Most topics within the implementation stage of TLP, such as engineering, labor, construction specifications, bidding, timelines, and contracting are highly technical and outside the scope of this document but are described with great detail in Piercy et al.

[9]For example, thinner and more precise applications requiring constant adjustments are more expensive compared to thicker, in-place applications where there may be more room for error

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(2023). However, implementation teams should expect lengthy project durations due to site recovery times, delays from storm events, wetland growing seasons, and environmental work windows or time-of-year restrictions required to avoid or minimize impacts to sensitive habitats (e.g., nursery and anadromous fish spawning areas) during periods of peak productivity and biological activity[10].

Relevant to the purpose of this document, existing guidance emphasizes the importance of using biodegradable or temporary containment structures (e.g., straw bales, coir logs, earthen dikes, sandbags, geotubes, and other structurally diverse materials further described in Hametz et al. 2025) consistent with local sediment migration patterns that prevent sediment loss and impacts to adjacent habitats or, if nearby, navigation channels. However, Anchor QEA (2025) warns that "over containing" sediments can increase both project costs and overall environmental disturbance associated with their installation and removal. More permanent containment structures (e.g., offshore breakwaters, marsh toe revetments, oyster sills, etc.) can also be incorporated into project designs to facilitate long-term sediment containment and capture.

Monitoring, Adaptive Management, and Success

TLP is generally considered successful when the application of dredged material increases wetland elevation, supports and maintains desired foundational vegetation communities, sustains key ecological functions and processes, and satisfies pre-determined project objectives and success criteria as determined through long term-monitoring and regular reporting. North Carolina stakeholders also consider TLP successful if there is consistent sediment placement and containment across the marsh surface, adequate post-construction tidal flow, benefits that exceed financial and ecological costs, and demonstrable returns on investment and public perception. If monitoring indicates unsatisfactory project performance, adaptive management may be necessary to reach the desired outcome or minimal thresholds as defined by project partners (Table 2).

[10]In some cases, minimization measures and other best management practices such as turbidity curtains are used in lieu of time-of-year restrictions to contain suspended sediments until pre-determined conditions are met.

Table 2: Example monitoring metrics, effectiveness criteria, and potential adaptive management actions if criteria are not met. Table adapted from Correll et al. (2024).

Project Phase	Monitoring Metric	Performance Criteria	Adaptive Action
Construction	Target Elevation	Placement depth meets target	Adjust placement strategy to achieve target
Post Construction	Plant Cover	Percent cover of aboveground native biomass increases to pre-determined metric within three years	Conduct additional plantings and consider different species if elevation changed
Maintenance	Shoreline Position	Shoreline change rates less than a pre-determined rate	Stabilize shoreline against further erosion

Based on the results of the TLP workshop, stakeholders in North Carolina believe that at minimum, monitoring plans should include basic metrics such as vegetation abundance and recovery to include invasive species; the recovery and response of invertebrates, birds, fishes, and reptiles; changes in elevation; sediment properties; turbidity and water quality. Myszewski et al. (2017) showed that even simple monitoring of bulk density and organic matter content are effective precursors of plant growth and expansion (associated with higher bulk densities) and soil productivity (associated with higher organic matter content). Depending on funding and resource availability, monitoring metrics could also include hydrological responses; microbial processes; and quantifying ecosystem services such as flood reduction or economic benefits. In some cases, it may also be appropriate to monitor and mitigate for temporary environmental impacts associated with wetland mats, pipelines, or other construction activities and to integrate adaptive best management practices (like those typically used for stormwater and sediment and erosion control) during implementation. Ultimately, stakeholders in North Carolina also believe that securing reliable funding for long-term post-construction monitoring is important for ensuring success and generating data to support subsequent TLP projects.

While most guidance recommends at least quarterly monitoring for five years (Anchor QEA 2025; Hametz et al. 2025; Correll et al. 2024; Raposa et al. 2020; Myszewski et al. 2017) with associated maintenance to control invasive species or replant bare sediments, our review of existing documents suggests a best practice of monitoring throughout the entire project lifespan (before, during, and after sediment placement) at regular intervals and for up to ten years as determined *a priori* by project planning teams. Adequate monitoring must also reliably compare results from placement, control and reference sites using consistent and robust statistical methods. For example, Raposa et al. (2020) recommends more replication when there is higher spatial and temporal variation across sites. A scientifically rigorous Before-After-Control-Impact (BACI) design (Underwood 1992; Stewart-Oaten et al. 1986) can also be used to compare changes over time between

placement, reference, and control sites to isolate TLP impacts from natural fluctuations in ecosystem state.

Existing guidance recommends the development of standard operating procedures (SOPs) for monitoring and adaptive management plans during the planning and design phases to ensure consistency across projects, to establish acceptable thresholds for monitoring criteria and duration, to standardize data for analyzing inter-project performance, and to develop appropriate budgets and project timelines. As TLP and other beneficial use projects expand nationwide, Reilly et. al (2026) specifically calls for improved reporting and standardization of project design, implementation, framework development and quantitative monitoring by 1) explicitly describing project goals and linking them to monitoring metrics, 2) defining success criteria, 3) using consistent terminology referencing sediment placement, 4) reporting placement depth, range, and initial elevations, 5) including local tidal range and datum, 6) clarifying controls versus references, 7) considering longer monitoring timeframes, and 8) sharing comprehensive results beyond peer-reviewed summaries.

Regulation, Policy and Permitting

Regardless of state policies, TLP proposals are subject to a myriad of federal regulations that could limit or even prevent their implementation (Table 3). Before submitting permit applications, project teams are typically encouraged to consult permitting agencies during the planning stage and throughout the project lifespan to ensure that federal requirements are satisfied and that preferred alternatives maximize long-term environmental benefits. Involving permitting agencies at the onset also helps with establishing budgets and project timelines for the completion of necessary documentation.

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Table 3: Overview of federal natural resource laws, regulations, and associated agencies[11] that may be applicable to thin layer placement projects. Adapted from Kordesch et al. (2024) and Raposa et al. (2020).

	Law	Agency	Permit or Authorization	Regulated Activity or Resource
Water	Section 401, Clean Water Act	State Water Board (EPA Oversight)	Water Quality Certification	Discharges requiring a federal license or permit to comply with state or federal water quality standards
	Section 404, Clean Water Act	USACE	General Permit (Nationwide, Regional); Standard Permit (Individual); Letter of Permission	Discharge of dredge or fill material into waters of the U.S., including wetlands
	Section 10, Rivers and Harbors Act	USACE	Section 10 Permit	Work in, under, or over a navigable waterway
Water and Land	Coastal Zone Management Act	NOAA	Federal Consistency Determination	Project modifies land or water use in the coastal zone of a state with an approved Coastal Management Program
Species	Section 7 and 10, Endangered Species Act	USFWS / NMFS	Incidental Take / Biological Opinion (Section 7); Incidental Take Permit	Activities affecting species listed as threatened or endangered under the Act
	Marine Mammal Protection Act	USFWS / NMFS	Letter of Authorization; Incidental Harassment Authorization	Activities affecting marine mammals and their products
	Section 305(b)(4)(A), Magnuson-Stevens Fishery Conservation and Management Act	NMFS	Essential Fish Habitat Consultation	Activities affecting federally designated essential fish habitat and habitat areas of particular concern.
Cultural Resources	National Environmental Policy Act	Federal Lead Agency (EPA Oversight)	Environmental Assessment; Finding of No Significant Impact; Environmental Impact Statement	Major federal actions significantly affecting the quality of the human environment
	National Historic Preservation Act	State Historic Office / Federal Lead Agency	Memorandum of Agreement / Programmatic Agreement	Activities affecting cultural resources

Regulating and permitting TLP differs across state boundaries. In Maryland, Virginia, and Massachusetts, in-water unconfined placement of dredged material is not allowed under state enforceable policies unless it is used for beneficial use, restoration, or other projects

[11]USACE = U.S. Army Corps of Engineers; NOAA = National Oceanic and Atmospheric Administration; USFWS = U.S. Fish and Wildlife Service; NMFS = National Marine Fisheries Service; EPA = Environmental Protection Agency

intended to benefit aquatic resources (Anchor QEA 2025; MassDEP 2024). Georgia law allows TLP and other beneficial uses if the project is of public interest (Shudtz et al. 2025). In Delaware (DNREC; https://regulations. delaware.gov/AdminCode/title7/7504) and New York (NY DEC; https://dec.ny.gov /regulatory/permits-licenses/waterways-coastlines-wetlands), state regulations do not explicitly prohibit wetland fill (and therefore TLP), though any proposal to do so must be appropriately justified. In Connecticut (CT DEEP; https://portal.ct.gov/DEEP/Coastal-Resources/Coastal-Permitting/Overview-of-the-Connecticut-Coastal-Permit-Program), Certificates of Permission rather than formal permits can be issued for projects intended to restore degraded wetlands. As mentioned previously, New Jersey's administrative code speaks directly to dredged material placement (NJ DEP; https://www.law. cornell.edu/regulations/new-jersey/N-J-A-C-7-7-15-12).

In North Carolina, TLP is currently not permissible under the NC Coastal Area Management Act (CAMA) and Dredge and Fill Law which prohibit and classifies TLP as wetland fill. If submitted, an application for TLP would be denied but eligible for a variance from the Coastal Resources Commission, the state's rulemaking body. The Commission can elect to approve projects that technically violate state regulations if the following criteria are met:

- Strict application of state development standards would result in unnecessary hardships.
- Hardships result from conditions peculiar to the property (i.e., location, size or topography).
- Hardships did not result from actions taken by the petitioner.
- The variance is consistent with the spirit, purpose and intent of state development standards; will secure public safety and welfare; and will preserve substantial justice.

As such, applicants must demonstrate that a TLP project has public benefits consistent with protecting coastal resources, public benefits that outweigh the adverse impacts of the project, no alternate site available for the project, and a design and implementation plan that incorporates all means and measures to mitigate adverse environmental impacts (Table 4). The variance process also allows the Coastal Resources Commission to proceed with rulemaking to establish thresholds or other criteria for future, related projects. In addition to CAMA and the NC Dredge and Fill Law, TLP proposals would also require state authorization from the NC Divisions of Water Resources and potentially the Division of Energy, Mineral, and Land Resources or applicable town, city, or county permits.

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Because there is growing interest in TLP and other types of beneficial use across the state, the NC Division of Coastal Management anticipates a potential need for future rulemaking that would authorize TLP and related projects through the typical CAMA permit process (see NC DCM 2022 for recent guidance on state-specific site assessments and monitoring). The syntheses presented here are therefore intended as a TLP source document to help inform next regulatory steps as needed.

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Table 4: CAMA & Dredge and Fill Permit Considerations in North Carolina. Adapted from Shudtz et al. (2025).

Factors for Permit Denial	Implication for TLP Project Applications
General Factors	
The development is inconsistent with written state guidelines or local land-use plans.	Review guidelines and land-use plans to ensure project is consistent; discuss concerns with relevant agencies early in the project proposal phase.
There is a practicable alternative that would accomplish the overall project purposes with less adverse impact on public resources, considering engineering requirements and all economic costs.	Provide research and data on the benefits of TLP, including the value of ecosystem services such as hazard reduction and recreation opportunities that will benefit local communities; provide comparison to costs of offshore disposal or upland containment.
The proposed development would contribute to cumulative effects that would be inconsistent with specific written guidelines on various state Areas of Environmental Concern.	Emphasize that TLP intended and designed to have myriad positive environmental and ecosystem benefits; include monitoring and adaptive management plans.
Areas of Environmental Concern	
In coastal wetlands, the project would contradict any order to promote public safety, health, and welfare or to protect public and private property, wildlife, and marine fisheries in coastal wetlands.	Emphasize that TLP is intended to specifically achieve state goals and policies to promote public safety, health, and welfare and to protect property and wildlife in and around coastal wetlands; provide research and data on the benefits and success of smaller pilot projects.
In estuarine waters, a permit would also be denied per the state's Dredge and Fill law for having a significant adverse effect on public use of water, on the value and enjoyment of property of riparian owners, on public health, safety, or welfare; on conservation of public and private water supplies; on wildlife or fresh water, estuarine, or marine fisheries	Cite scientific research and data on the ecosystem services provided by healthy and intact coastal wetlands; on the property value increase; anticipate implementing best management practices for sediment and erosion control during project implementation period.
In a fragile or historic area or area containing environmental or natural resources of significance, the development will result in major or irreversible damage to one or more of the historic, cultural, scientific, environmental or scenic values or natural systems.	Emphasize how the proposed project will support and improve resilience in coastal areas; cite scientific research that show negative impacts of a "do nothing" alternative.
On public trust lands, the project will jeopardize the public rights or interests in those lands.	Highlight recreational opportunities, increased ecosystem resilience, and other public benefits TLP
In natural hazard areas, the project would occur in such a manner as to unreasonably endanger life or property.	Cite scientific research and data that demonstrates coastal marsh benefits for estuarine beaches, shoreline of estuarine and public trust waters, floodways and floodplains
Variance Approval	
The requested variance is consistent with the spirit, purpose, and intent of the rules, standards, or orders; will secure public safety and welfare; and will preserve substantial justice.	Cite language from CAMA and other state policies that support preserving coastal wetlands and their values; provide evidence of public benefits from healthy coastal wetlands and bird islands, such as recreation, hazard reduction, and productive fisheries.

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Resource and Regulatory Concerns

While TLP may be an effective tool to enhance wetland resilience, there are several concerns associated with the impacts of sediment placement on long-term wetland function. Results from the TLP workshop indicated that material compatibility, invasive species, a lack of post-project regulatory oversight, unforeseen impacts to subtidal or intertidal fish habitat or adjacent habitats, and sediment contamination and associated risks to fish, wildlife, and public health would be of particular concern in North Carolina. Elsewhere, resource concerns are also generally associated with the following, all of which are most likely applicable to North Carolina:

- Lack of geographically relevant studies and regulatory approval pathways
- Sediment compaction and heavy equipment
- Plant smothering and recovery
- Establishing appropriate environmental windows and work moratoria
- Property ownership / land use conflicts
- Funding and equipment needs
- Ecological and water quality impacts
- Turbidity during initial placement and settlement of material
- Benthic and infaunal invertebrates
- Migratory birds and waterfowl
- Submerged aquation vegetation and shellfish
- Formation of sulfidic soils
- Length of time needed to meet "reference conditions"
- Cumulative impacts associated with repeated applications or amendments
- Establishing what qualifies as marsh restoration to justify TLP
- Establishing a definition for a "degraded" marsh
- Overdesigning projects
- Containing material once placed

During alternatives development, TLP may not be considered in the short-term as the "least environmentally damaging practical alternative" due to initial impacts from sediment placement on ecological function. However, reviewing agencies should consider and identify acceptable trade-offs between temporarily disruptive but long-term beneficial projects that prevent permanent wetland loss under future environmental change[12]. Alternatives development should also address concerns related specifically to habitat

[12]To alleviate additional resource and regulatory concerns, selecting extremely degraded sites with little ecological value minimizes risks but maximizes potential benefits.

trade-offs. Correll et al. (2024) suggest that like most restoration projects, TLP should be planned around ecosystem-based management rather than individual species management when evaluating trade-offs in project design. For example, while raising wetland elevation could help restore intertidal and upland habitat for certain avian or mammalian communities, it may also reduce intertidal and subtidal habitat for submerged aquatic vegetation, fish and aquatic invertebrate communities. Such tradeoffs merit consideration during project planning.

Information Needs

Based on reviews of primary literature, existing guidance documents, and results from the TLP workshop, there is a general need in North Carolina to evaluate more large-scale projects at the acreage scale that incorporate at least 10 years of monitoring to supplement recent and ongoing studies that are restricted to the experimental plot scale. Quantifying the response of fisheries and other faunal communities to habitat change represents another major knowledge gap. Lastly, there is a lack of information on the cumulative impacts associated with repeat sediment applications, and there is a need to develop high resolution regional models that project the outcome of sediment placement. For specific projects, information needed to effectively evaluate TLP projects includes the history of local wetland loss and future trends associated with migration corridors; the ecologic and economic function of recipient wetlands; detailed site mapping to include existing elevations, soil and vegetation characteristics, hydrological and geomorphological dynamics, and relevant archaeological surveys; and overall baseline site characterization.

Conclusion

TLP is an effective tool to enhance wetland resilience to environmental change by building elevation and facilitating sediment accretion within degrading ecosystems. To ensure success, projects must be carefully planned by a diverse team of stakeholders and subsequently executed, monitored, and adaptively managed with specified goals, objectives, and reliable long-term funding, resources, and support from research labs, contracting firms, funding agencies, and environmental organizations.

TLP projects at minimum should consider sediment compatibility, target elevation and thickness, and baseline hydrology and environmental characteristics that are compared between placement, reference, and control sites. Generally, recipient wetlands should maintain an elevation between sea level and mean high water to promote adequate tidal inundation and the natural growth of native plant species. While coastal states are at various stages of TLP implementation ranging from exploratory to well-established programmatic frameworks, there is persistent widespread interest in TLP and other

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beneficial use techniques to combat sea level rise and wetland loss. As a result, coordinated efforts to establish science-informed purpose and need statements, standard operating procedures, monitoring and reporting requirements, and permitting and regulatory pathways for emerging projects are both timely and critical for building stakeholder confidence.

In North Carolina, implementing TLP in the future will most likely occur on a case-by-case basis with local and regional factors in mind. Based on the success of projects elsewhere and the comfort level of North Carolina stakeholders, initial projects are expected to involve smaller-scale "like-on-like" application of dredged material (e.g., from a maintenance event) onto a deteriorating salt marsh (e.g., one experiencing active vegetation loss, interior ponding, inadequate sediment supply or migration pathway) with the goal of raising surface elevation enough to support the restoration of vegetated intertidal habitats and the facilitation of sediment accretion and long-term resilience to future change. Early projects would most likely also be coupled with robust temporary or permanent containment structures within isolated systems that minimize potential impacts to adjacent habitats or infrastructure.

Looking Ahead

The information presented in this document, including the results of the TLP workshop, represents an action item completed for the 2026 CHPP amendment. This paper is intended to enhance agency understanding of TLP and to ensure stakeholders are well-poised to evaluate projects as they are developed. Over the next five years and before the next CHPP update, DEQ staff will create a state-wide multi-agency workgroup to progress TLP (and possibly other beneficial use efforts) in North Carolina through regular meetings, additional workshops (e.g., those focused specifically on regulation, permitting, engineering, etc.) and discussions and to establish best practices specific to the state. This group could update existing guidance or develop a toolkit for North Carolina that includes standard monitoring procedures or design considerations. DEQ staff will also evaluate regional statuses and trends of existing wetlands across coastal North Carolina, incorporating new high-resolution land cover data obtained through the 2021 CHPP (2021 recommended action 5.1). DEQ staff will additionally leverage existing resources such as the NC Flood Resiliency Blueprint, NC Executive Order 305 Hub, Southeast Conservation Blueprint, Marsh Restoration Community Benefit Calculator, the U.S. Army Corps of Engineers Resiliency Urgency and Beneficial Use Map, and other geospatial tools to identify candidate areas that may benefit most from TLP with the ultimate goal of planning for ongoing and future environmental change to enhance wetland resilience.

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Specific Recommended Actions

1. DEQ staff will develop an issue paper that summarizes the best available science and guidance for TLP, including case studies, information needs, success criteria, an overview of important scientific and permitting considerations, policy and resource concerns, and outcomes from a multi-agency TLP workshop (this document).
2. DEQ staff will create a state-wide multi-agency workgroup to progress TLP and facilitate the establishment of best practices specific to North Carolina
3. DEQ staff will evaluate the status and trends of wetlands across coastal North Carolina, incorporating high-resolution land cover data obtained through the 2021 CHPP.
4. DEQ staff will leverage existing tools and data sources to identify candidate areas that may benefit most from TLP.

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Appendix A: Summary of Thin Layer Placement Projects Described Throughout This Paper

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Site	State	Dominant Plant Species	Mean Tidal Range (m)	SLR Rate (mm yr^{-1})	Existing Marsh Elevation (m, NAVD88)	Project Goal	Project Size	Target Elevation Increase (cm)	Placement Thickness (cm)	Sediment Type	Marsh Recovery Time (years)	Study Duration (years)	Reference
Seal Beach National Wildlife Refuge	CA	*Spartina foliosa, Batis maritima*	0.34–3.56	0.98–6.23	1.34	Offset high SLR risk and subsidence, build elevation capital, enhance habitat for *Spartina foliosa* and Ridgway's Rail.	10 acres	7.6	22–32	Coarse (84–85% sand)	1–1.5	1–3	McAtee et al. (2020); Thorne et al. (2019)
San Francisco Bay	CA	*Salicornia pacifica*	1.25	Not Specified	1.08–1.79	Enhance wetland resilience to rising seas; compare low to high marsh performance to TLP	0.7 x 0.7 m plots	10	7–14	Coarse (75% sand)	3	3	Raposa et al. (2023)
Elkhorn Slough	CA	*Salicornia pacifica*	1.60	Not Specified	1.43–1.86	Enhance wetland resilience to rising seas; compare low to high marsh performance to TLP	0.7 x 0.7 m plots	10	7–14	Coarse (75% sand)	3	3	Raposa et al. (2023)
Guilford Yacht Club	CT	*Spartina alterniflora*	1.70	4–6	Not Specified	Examine how differential thickness alters plant-soil carbon dynamics and promotes resilience to SLR.	1 x 1 m plots	5–15	5–20	Fine (84% silt and clay)	1–2	2	Puchkoff and Lawrence (2022)
Glynn County Marsh (Brunswick)	GA	*Spartina alterniflora*	Not Specified	Not Specified	Not Specified	Investigate capability of high salt marsh to recover from dredged material disposal	0.9 m diameter plots	Not Specified	8–91	Coarse sand	within 1 (under 23 cm placement thickness)	2	Reimold et al. (1978)
Glynn County Marsh (Brunswick)	GA	*Spartina alterniflora*	Not Specified	Not Specified	Not Specified	Evaluate considerations, impacts, and system recovery associated with TLP placement over a representative area	12 acres	Not Specified	15–23	Fine Sand and Silt	0.75	2	Mohan et al. (2021)
Jekyll Island	GA	*Spartina alterniflora*	Not Specified	Not Specified	Not Specified	Encourage plant growth at higher elevations, reducing the probability that the marsh grass will be degraded by increased saltwater inundation	5 acres	Not Specified	15–25	Fine (Unspecified)	3–5	5	https://coastalgadnr.org/JekyllCreek
Mississippi River Delta	LA	*Spartina alterniflora, Scirpus americanus, Vigna luteola, Potamogeton spp.*	0.40	9.40	open water marsh pond	Ameliorate SLR impacts; test sediment subsidies to counter subsidence; restore emergent vegetation.	1.24–106 acres	5–15, up to 30	0–22	Coarse and Fine (4-58% sand)	1–3	2–3	Mendelssohn and Kuhn (2003); Slocum et al. (2005); Ford et al. (1999); Stagg and Mendelssohn (2010)
Mississippi River Delta	LA	*Spartina patens, Schoenoplectus americanus*	Not Specified	3.6–17.7	Not Specified	Examine functional response of vegetated brackish marsh and interior ponds to sediment enhancement.	27–1373 acres	Varied By Location	15–20	Not Specified	within 1, pond sites only	1	La Peyre et al. (2009)
Leeville / Bayou LaFourche	LA	*Spartina alterniflora*	0.30	11.1	0.04–0.30	Increase elevation and enhance plant recovery following drought-induced marsh dieback.	400 m transects within 1.24 acre plots	14–36	6–41	Not Specified	1–5	1–7	Schrift et al. (2008); Stagg and Mendelssohn (2010); Tong et al. (2013)
Bayou Dupont	LA	*Phragmites australis, Spartina alterniflora, Spartina patens, Scirpus americanus*	0.32	9.1	open water marsh pond	Increase soil surface elevation to support vegetation growth; prevent conversion to open water	160 acres	15	15	Not Specified	2	2	Howard et al. (2020)
Barataria Basin / Bay	LA	*Spartina alterniflora*	Not Specified	Not Specified	Not Specified	Examine effects of sediment addition on plant regeneration and productivity in a deteriorating marsh	1.44 x 1.44 m plots	8–10	2–10	Coarse and Fine (40% sand)	within 2 growing seasons	1.5	DeLaune et al. (1990)
Paul J. Rainey Wildlife Sanctuary	LA	*Spartina patens*	Not Specified	Not Specified	0.37	Determine if elevation change, soil compression, and sediment consolidation were differentially affected by different amounts of sediment; assess sediment effects on ecosystem function	4 x 4 m plots	Not Specified	2–20	Fine (82% silt and clay)	within 1, then subsided	2.5	Graham and Mendelssohn (2013)
Chesapeake Bay, MD	MD	*Spartina alterniflora, Spartina patens, Distichlis spicata, Juncus roemerianus*	0.74	Not Specified	0.40	Enhance wetland resilience to rising seas; compare low to high marsh performance to TLP	0.7 x 0.7 m plots	10	7–14	Coarse (75% sand)	3	3	Raposa et al. (2023)
Shorters Wharf	MD	*Spartina patens, Distichlis spicata, Spartina alterniflora*	0.24	Not Specified	Not Specified	Increase resiliency to SLR; restore elevation capital; extend lifespan of habitat for Saltmarsh Sparrow and Black Rail	40 acres	30	15–35	Semi Fine (68% silt and clay)	2	2	McCullough et al. (2021); Whitbeck et al. (2019)
Poplar Island	MD	*Spartina alterniflora, Spartina patens*	0.34	5.7	0.24–0.64	Mitigate marsh drowning and assess the effect of TLP on carbon sequestration and resilience under rising sea levels	30–50 acres	Varied By Location To Achieve 80% Low Marsh	15–30	Fine (Not Specified)	within 1	2–7 with longer model simulations	Morris and Staver (2024); Cornwell et al. (2025)
Waquoit Bay	MA	*Spartina alterniflora, Spartina patens, Distichlis spicata, Juncus roemerianus, Iva frutescens*	0.55	Not Specified	0.40–0.64	Enhance wetland resilience to rising seas; compare low to high marsh performance to TLP	0.7 x 0.7 m plots	10	7–14	Coarse (75% sand)	3	3	Raposa et al. (2023)
Great Bay	NH	*Spartina alterniflora, Spartina patens, Juncus gerardii, Distichlis spicata, Salicornia depressa, Schoenoplectus robustus*	2.7	4.17	0.73–1.05	Enhance wetland resilience to rising seas; compare low to high marsh performance to TLP	0.7 x 0.7 m plots	10	7–14	Coarse (75% sand)	3	3	Raposa et al. (2023)
Avalon	NJ	*Spartina alterniflora*	1.39	10	0.26–0.61	Increase marsh elevation and improve soil aeration to allow marshes to keep pace with SLR and restore deteriorated back barrier wetlands	100 m transects	73–91	5–83	Coarse and Fine (15-80% sand)	0.5–3.5	6	Harris et al. (2021); VanZomeren et al. (2018); Cheng et al. (2025)
Thompsons Beach	NJ	*Spartina alterniflora*	1.60	Not Specified	0.12	Offset elevation loss caused by historic farm impoundments and create conditions for plant recolonization	1.11 acres	49	42	Fine (100% silt and clay)	5	5	Feigin et al. (2026)
Sturgeon Island	NJ	*Spartina alterniflora, Phragmites australis*	1.3	4.2	0.5–1.3	Enhance surface elevation to support nesting bird habitat and stabilize the low-lying northern portion of the island.	13 acres	Not Specified	37–39	Fine (Not Specified)	3	4	Harris et al. (2025)
Jamaica Bay	NY	*Spartina alterniflora*	Not Specified	2.9–4.3	0.6–0.7	Increase marsh elevation, enhance bird habitat, and document lessons for future TLP applications.	1.5–2.5 acres	23-43	up to 100	Coarse and Fine	within 2 growing seasons	1–4	Hartig et al. (2024); Haight et al. (2026); Frame et al. (2005)
Masonboro Island	NC	*Spartina alterniflora*	1.2	Not Specified	Not Specified	Determine if placing dredged material on sediment-starved back barrier marshes could offset submergence without negatively affecting marsh function	6.4 x 6.4 m plots	8.5–10	0–10	Coarse Sand	1–2	2	Croft et al. (2006)
Masonboro Island	NC	*Spartina alterniflora, Spartina patens, Distichlus piscata, Borrichia frutescens*	1.2	1.9	-0.26–0.48	Enhance wetland resilience to rising seas; compare low to high marsh performance to TLP	0.7 x 0.7 m plots	10	7–14	Coarse (75% sand)	3	3	Raposa et al. (2023)
Freeman Creek	NC	*Spartina alterniflora*	0.8	12.3	-0.012 – -0.11	Increase elevation capital and marsh resilience to SLR by raising the platform to an optimal elevation for vegetative growth	8 x 3 m plots	Not Specified; Dependent on Elevation-Biomass Relationship	6	Coarse (90% sand)	within 1	5	Davis et al. (2022, 2017)
Gull Rock	NC	*Juncus roemerianus, Spartina alterniflora, Distichlis spicata*	Not Specified	Not Specified	Not Specified	Reduce environmental impacts associated with dredged material placement; describe long-term effects	Not Specified (8-12,000 cubic yards of material)	3–10	1–20	Fine (Unspecified)	within 1	10 years post-placement	Wilber (1992)
Ninigret Marsh	RI	*Spartina alterniflora, Spartina patens, Distichlis spicata, Juncus gerardii*	<1	2.83–4.78	-0.109	Restore high marsh species; increase marsh resilience to future SLR by building elevation capital; test the efficacy of sediment placement with adaptive management	22 acres	18–30 Depending on Elevation Zone	10–48	Coarse (90% sand)	3–4	5–6	Raposa et al. (2022)
Narragansett Bay	RI	*Spartina alterniflora, Spartina patens, Distichlis spicata, Juncus gerardii*	1.2	Not Specified	0.40–0.64	Enhance surface elevation to support nesting bird habitat and stabilize the low-lying northern portion of the island.	0.7 x 0.7 m plots	10	7–14	Coarse (75% sand)	3	3	Raposa et al. (2023)
Coggeshall Marsh	RI	*Spartina alterniflora*	1	1.5–5.3	Not Specified	Increase resilience to SLR by boosting elevation to allow vegetation to recolonize; investigate impacts on nitrogen cycling	0.5 x 0.5 m plots	10	7–14	Coarse (90% sand)	4	1–4	Bartolucci and Fulweiler (2024, 2026)
Chesapeake Bay, VA	VA	*Spartina alterniflora, Spartina patens, Distichlus spicata*	0.76	5–6	0.19–0.46	Enhance wetland resilience to rising seas; compare low to high marsh performance to TLP	0.7 x 0.7 m plots	10	7–14	Coarse (75% sand)	3	3	Raposa et al. (2023)

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Appendix B: Thin Layer Placement Coordination Workshop Report

Summary

The purpose of this workshop was to discuss thin layer placement (TLP) of sediment as a tool for enhancing wetland resilience and to share successes, challenges, concerns, and lessons learned associated with the ecological impacts of placing sediment on deteriorating wetlands. Workshop attendees were provided a scientific overview of TLP and how other coastal states manage projects related to TLP and the beneficial use of dredged material. These discussions included several case studies along the U.S. east coast from New Jersey to Georgia. The workshop included small group discussions on topics related to post-construction monitoring, best management practices, habitat trade-offs, success criteria, selecting appropriate placement sites, and identifying information needs. When evaluating the potential for TLP in North Carolina, workshop attendees highlighted the importance of clearly identifying the goals, objectives, purpose and need for these projects on a case-by-case basis while considering the above topics on a specifically defined local or regional scale. As a result, a collaborative multi-agency network of stakeholders is most likely needed to progress TLP in a responsible manner. Information gathered from this workshop will be incorporated into the 2026 amendment to the Coastal Habitat Protection Plan, which identifies TLP as a priority issue within the broader theme of planning for multi-decadal wetland change.

Introductory Remarks

Charlie Deaton, NC Division of Marine Fisheries (DMF) Habitat Protection Program Supervisor, began the workshop with introductions (see Subappendix A; attendee list) and an outline of the purpose and objectives of the meeting to inform the 2026 Coastal Habitat Protection Plan (CHPP) amendment (see Subappendix B; workshop agenda).

Daniel Govoni, NC Division of Coastal Management (DCM) Policy Section Chief, reinforced that the workshop was not intended to discuss the permitting, policy, or regulatory components of TLP; rather, it was intended to discuss the relationships between TLP and coastal habitats and resources. Nonetheless, Mr. Govoni summarized that TLP is not currently permissible in North Carolina because in most cases, the Coastal Area Management Act (CAMA) and associated guidelines for areas of environmental concern prohibit wetland fill. However, TLP could be permitted by the NC Coastal Resources Commission (CRC) through the CAMA variance process. There has been growing interest in TLP across coastal North Carolina, and NC DCM anticipates a potential need for future rulemaking that would authorize TLP through the typical CAMA permit process.

Research Overview

Dr. Jenny Davis, Research Ecologist with the National Oceanic and Atmospheric Administration (NOAA) Coastal Resilience, Response and Assessment Branch (CRABB), provided a broad overview of TLP and

related methods for the Beneficial Use of Dredged Material (BUDM) with a presentation entitled Beneficial Use of Sediments for Habitat Restoration and Creation. The presentation began with a brief description of three beneficial use techniques to reverse or offset estuarine habitat loss:

- **Thin Layer Placement:** adding elevation to a deteriorating marsh to create more suitable conditions for marsh plant growth. This term is often used interchangeably with 'beneficial use.' However, TLP is just one type of beneficial use amongst others such as those defined below.
- **Thick Layer Placement:** creation of intertidal or upland habitat where it currently does not exist (i.e., habitat conversion).
- **Strategic Placement:** nearshore placement that allows for the natural distribution of sediments via waves and tides.

The remainder of the presentation focused on thin layer placement with an additional case study highlighting thick layer placement. Dr. Davis explained that the goal of each technique is to elevate existing wetlands that are vulnerable to sea level rise so that they are less vulnerable to sea level rise but remain within a vegetation-specific growth range. As such, target elevations are defined by marsh position relative to the tidal frame, and accurate placement of thin sediment layers on the marsh surface to achieve a specific target elevation becomes challenging. Dr. Davis emphasized that while TLP results in the short-term disruption of natural marsh processes, there are potential long-term benefits for marsh resilience.

Dr. Davis highlighted three TLP studies conducted in North Carolina, emphasizing that studies specific to the state have been limited and small-scale:

- Gull Rock (Wilber 1992)
- Masonboro Island (Croft et al. 2006)
- Freeman Creek, Camp Lejeune (Davis et al. 2019)

The bulk of Dr. Davis's presentation described two collaborative, large-scale case studies in Maryland: Deal Island Wildlife Management Area (thin layer placement) and Swan Island (thick layer placement):

Deal Island Wildlife Management Area

- Completed in 2024
- 167,000 cubic yards of material covering 72 acres
- Goal: raise majority of marsh platform to high-marsh elevation
- Sediment Source: Wicomico River
- Sediment Texture: fine
- Methods: sediments pumped across land (14 miles) to placement site and distributed by sheet flow across the marsh platform
- Placement Depth: up to 18 inches
- Containment Method: approximately 30,000 straw bales
- Plantings: hand planting over 700,000 native species over two growing seasons to discourage the establishment of invasive species.
- Outcomes and Lessons Learned

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- Straw bales were effective containment structures except when the structure became compromised during a winter storm.
- Site access was challenging due to limited nearshore depth and submerged aquatic vegetation (SAV).
- Recommendation to "plant like crazy" wherever sediment is bare.
- Vegetative response is dynamic in early years and likely influenced by nutrients in deposited sediments and plant community changes in response to increased marsh elevation.
- Native vegetation that did not persist after the first year was replanted.
- Existing invasive common reed (*Phragmites australis*) on the site that was not treated before sediment placement had notably expanded by year two.
- It can take several years to reach equilibrium (i.e., target elevation profile)
- Created new habitat for salt marsh sparrow.

<u>Swan Island</u>

- Completed in 2019
- 60,000 cubic yards of material covering 12 acres
- Goal: create new habitat matrix (low and high marsh, dunes)
- Sediment Source: Chesapeake Bay Navigation Channel
- Sediment Texture: fine and coarse
- Methods: thick layer deposition of dredged material
- Placement Depth: a few centimeters up to one meter
- Containment Method: coir logs
- Plantings: hand planting approximately 200,000 native plants over two years
- Outcomes and Lessons Learned:
  - An as-built survey is needed to track changes over time and compare to intended design.
  - The containment structure remained in place.
  - It was more difficult to contain fine sediments, but installing fresh containment structure helped mitigate some loss.
  - Adjacent SAV was covered due to the loss of some fine sediments. While unintentional, it is necessary to evaluate whether potential trade-offs such as this are acceptable if they occur.
  - Creating high marsh was more successful than creating low marsh.

The Swan Island project was characterized by several performance thresholds and subsequent adaptive actions if thresholds were not met (see below). As such, Dr. Davis emphasized the need to identify a source of funding to support corrective action.

- **Vegetative Percent Cover:** If vegetation in planting zones did not spread to 50-75% of the total placement area, failing areas had to be replanted. If elevation changed, planting compatible species was required.

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- **Sediment Surface Elevation:** If elevations did not remain within the appropriate range, additional sediment placement was required.
- **Shoreline Position:** If the designed shoreline did not maintain its position over time, the shoreline had to be rebuilt with additional sediment or plantings.

Dr. Davis concluded her presentation with closing thoughts and several best practices to consider for BUDM projects:

- Design for sediment leakage and plan/budget for additional fortification of containment structures.
- Plan/budget for replacing at least 50% of plants by the second year of the project.
- Attempt to control invasive species before sediment placement.
- Develop a monitoring and adaptive management plan with a temporal component to support corrective actions.
- Consider a range of acceptable outcomes.
- Offshore and upland disposal of dredged material deprives marshes of sediment that is critical for their survival (i.e., a "missed opportunity").
- Habitat trade-offs are inevitable.

At the conclusion of her presentation, Dr. Davis (JD) answered several questions from workshop attendees (A), which are paraphrased below:

- A: Who completed the work on Deal and Swan Island?
  JD: The work was contracted out but managed by the United States Army Corps of Engineers (USACE).

- A: Is there a way to determine a project's carrying capacity for plants and the nutrients needed to sustain them?
  JD: Due to variable site conditions, plant success is often driven by continuous planting and re-planting. Plant communities will most likely go through a "boom and bust" cycle until dense vegetation is established.

- A: For Deal Island, were straw bales used for containment allowed to naturally degrade?
  JD: Yes

- A: What is the strongest driving factor when determining placement depth?
  JD: Placement depth is incredibly project-specific, but it is important to establish boundaries. For example, identify a maximum allowable elevation or thresholds for other environmental variables.

- A: For Swan Island, can you discuss a bit more about comparing an as-built survey to intended designs?
  JD: Conducting as-built surveys are not part of the application process but are standard for projects on which NOAA participates. There was supposed to be more high marsh constructed from the dredged material, but during placement, some decisions had to be made on the fly which affected the end result.

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- A: Was sediment characterized to ensure that dredged material matched that of the placement site?
  JD: Generally. At Swan Island, sand was used to construct high marsh and dune habitats. Fine sediments were used to construct low marsh.

- A: Are TLP projects ever paired with other types of marsh restoration, for example tidal flow restoration?
  JD: Most likely.

- A: Should thin layer placement specifically be defined as "no change in habitat" even though Deal and Swan Island were characterized by the destruction of existing vegetation and the conversion from low to high marsh?
  JD: While converting to a different marsh elevation, the habitat itself still functions as a marsh.

- A: Did the US Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) have different perspectives on project goals?
  JD: Yes. The USFWS service is typically more upland habitat-oriented for bird populations while NMFS is more intertidal habitat-oriented for fish populations. State resource agencies requested them to scale back the volume of sediment used for the project.

State Resource Agency Panel

The workshop continued with a panel of representatives from several resource agencies outside of North Carolina to discuss progress on TLP and BUDM in other states (see Subappendix C; state resource agency panelist slides):

- Sarah Bouboulis, Coastal Programs Manager, Delaware Coastal Zone Management Program
- Tyler Kinney, Coastal Biologist, New Jersey Department of Environmental Protection
- Maggie Cavey, Beneficial Use Planner, Maryland Department of Natural Resources
- Jan Mackinnon, Program Manager, Georgia Department of Natural Resources

<u>Delaware</u>

Sarah indicated that in Delaware, they are in 'the thick of it' in terms of implementing TLP with only a few recent projects completed. There is a state-run dredge / beneficial use work group that meets regularly (approximately every 6-8 weeks) to ensure all participating agencies are on the same page and to check-on the status of active projects. This workgroup is comprised of researchers, restoration experts, the USACE, the Delaware Department of Natural Resources and Environmental Control (DNREC) Fish and Wildlife, the USFWS, and non-profit and contracting partners.

The state is currently developing a Dredge Material Management Plan to establish goals for how dredge material is used, including those uses that are not considered beneficial. While the USACE handles the majority of projects, Sarah indicated that the Watershed Stewardship Section of DNREC handles projects that involve dredging smaller waterways and evaluating potential resource impacts. Delaware often has issues with avoiding archaeological resources, and there are frequently challenges related to water quality

and matching material types with restoration projects. For any beneficial use project in Delaware, adaptive management plans are required.

Looking to the future, Delaware is interested in better streamlining the process for BUDM projects (there is often a lot of "waiting around" due to permitting constraints, etc.) and working more closely with regulatory partners to develop a framework for establishing criteria that satisfies the concerns of all participating agencies (e.g., number and types of samples required to assess dredged material compatibility).

New Jersey

In New Jersey, TLP and BUDM projects have already been scaled beyond the pilot stage through a programmatic approach and careful coordination between regulators, dredgers, and landowners. Tyler indicated that building a successful network, not the science, is the most challenging barrier to overcome. Tyler emphasized that successful programs begin at the policy level, and it is important to establish clear standards that do not lead to continuous permit battles with every project that is proposed.

New Jersey created their programmatic approach to TLP and BUDM projects by first building trust with regulators to develop, pilot, and if successful, engage in new policies for establishing project planning programs and systems. Tyler emphasized that successful programs must first and foremost address environmental needs that are also of value to dredgers (i.e., establish buy-in) and recommended that projects begin with land owned by state and federal governments to ensure proper scaling and consistency. The state's approach to TLP and BUDM is based on a logistics system and not a project-by-project approach: 1) regulators must develop methods for a programmatic approach once trust is earned, 2) landowners must develop and enforce a project development system to build trust, and 3) dredge teams must engage at the project level and buy-in to the concept of restoration.

Maryland

Maggie introduced the Maryland Beneficial Use Playbook and associated toolkit used by local counties and planners for navigating the BUDM landscape. The toolkit includes:

- Guidance Document: provides an overview of state regulations and associated considerations for dredged material management and types of beneficial use. This document can be used as a "grading system," and it outlines standards and criteria for implementing successful BUDM (for example, ensuring sediment type and chemistry are compatible between dredged and placement sites).
- Digital Matchmaking Tool / MD Coastal Atlas: a spatial planning tool that allows users to identify restoration sites and match dredge projects with potential BUDM projects.
- Roadmap and Process Diagram: provides flow charts and decision trees that outline the process for planning and implementing successful BUDM projects.

Maggie serves as a liaison between the regulatory community and restoration practitioners. She offered tips on how to discuss TLP and BUDM with mixed audiences to gain public trust and support for these projects:

- Dredge 'spoil' appears negative or a 'bad thing' to the public. Sediment is not a waste but an opportunity to build resilience. Adopting the term 'dredged material' removes that negativity and is more meaningful.
- Talk openly about the 'ugly phase' of TLP (short-term temporary impacts).
- Humanize projects and create outreach products beyond simple fact sheets.
- Refer to TLP as 'elevation enhancement.' It is more easily understood by the public and captures all types of sediment placement (thin versus thick layer).

Maryland currently has a "random assortment" of TLP and BUDM projects. Maggie indicated that their long-term goal is to create a state-wide matchmaking program that includes innovative, out-of-water reuse (for example, covering landfill material with dredged sediment) and traditional TLP and BUDM projects. To achieve this goal, the state is in the process of developing a twenty-year dredge management plan and playbook. The state has coordinated workshops and developed specific funding calls for BUDM projects. The state is also in the process of conducting a Shallow Draft Channel and Restoration Assessment to identify areas of concern that would benefit from BUDM. Maggie concluded her presentation by highlighting a successful, recent TLP project and associated outreach materials at the Chesapeake Bay Environmental Center in Queen Anne County, Maryland.

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Georgia

Jan provided an overview of TLP on Jekyll Island, Georgia in coordination with the Georgia Federal Consistency Program, the USACE, The Nature Conservancy, and the Jekyll Island Authority. This was one of just a few projects that have been implemented in the state. Unlike typical TLP projects, dredged material was placed on a healthy marsh rather than a deteriorating marsh. Details below:

- Completed in 2019
- 125,000 cubic yards of material (5,000 used specifically for TLP) over 5 acres
- Goal: keep dredged sediment within the system and increase marsh resilience to sea level rise.
- Sediment Source: Jekyll Creek and shallow areas of the Intracoastal Waterway
- Sediment Texture: fine
- Methods: direct pipe discharge with manual re-working of the material at low tide.
- Placement Depth: 6-10 inches
- Containment Method: coir logs
- Plantings: none

Jan discussed several outcomes and lessons learned from the project. Uncrewed Aerial Vehicle (UAV) imagery was used to evaluate aboveground plant biomass several years post-placement. After five years, 84% of the marsh had regrown primarily from the marsh edge inward. Revegetation took longer than

anticipated and did not support the vision of full regrowth between 3-5 years. There has been no evidence that the placement site has "caught back up" with the reference site since monitoring began, and benthic species diversity has decreased with evidence of ponding along the perimeter of the placement site. Overall, Jan acknowledged that monitoring could have been improved but was limited due to funding constraints.

Panel Discussion

At the conclusion of their presentations, Sarah (SB), Tyler (TK), Maggie (MC) and Jan (JM) answered several questions from workshop attendees (A), which are paraphrased below:

- A: Most coordination appears to involve state and federal agencies' relationship with the USACE. Are there any examples of TLP or BUDM projects conducted by private organizations, non-profits, or smaller agencies?
  JM: The Jekyll Island project was completed on state-owned land, so it was easiest to work with the USACE.
  MC: The Chesapeake Bay Environmental Center project was led by Queen Anne County in Maryland. The County selected a contractor and managed the project.

- A: What type of marsh was selected for the Jekyll Island project?
  JM: The Jekyll Island site was 100% *Spartina alterniflora* and was selected based on its elevation at the time and its proximity to the dredge location.

- A: How have state resource agencies evaluated concerns with potentially contaminated dredge material?
  TK: The New Jersey Department of Environmental Protection has a section devoted to testing sediments to ensure they are safe (Sediment Innovation Lab).
  SB: Delaware is addressing this concern through framework development. The state might test sediments from both dredged and placement sites and place contaminated dredge material on already-contaminated placement sites.
  MC: The Maryland Beneficial Use Toolkit provides guidance on determining allowable contaminant levels in dredged material for BUDM projects. The Toolkit provides information about concentration thresholds and the number of samples needed to complete such an evaluation. Sediment is treated as hazardous material if it is determined to be unsafe for beneficial use.

- A: Any suggestions for local dredge operators who do not have experience with TLP or BUDM but may have an interest in bidding on these types of projects?
  TK: Contact those with experience (e.g., the USACE) for assistance. In New Jersey, the Department of Transportation Maritime Services has been a valuable resource for dredgers.

- A: Were any of the projects discussed considered compensatory mitigation for impacts associated with other development activities?
  SB: It has been discussed in Delaware but has not yet been authorized.
  TK: Not in New Jersey
  MC: Not in Maryland

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JM: Not in Georgia

- A: What are the key policy decision points that allow projects to move forward?
  TK: It is most important to negotiate on the amount of data needed to guide successful restoration and satisfy participating agencies.

- A: Any projects that have less drastic impacts on vegetation in relation to building trust and alleviating concerns with habitat alteration?
  MC: It is difficult to completely avoid impacts to existing vegetation, especially for larger projects with high sediment volume.

Small Group Breakouts and Discussion

The final portion of the workshop involved small group discussions that addressed four questions developed by the workshop planning team and informed by attendees' input during the registration process:

1. What are your biggest concerns about sediment placement? What should be monitored? What does success look like? Do we need BMPs for sediment placement (e.g. suspended sediment control)? How to minimize impacts to adjacent habitats?
2. What do we need more information on to use sediment placement to increase marsh resilience?
3. These projects are happening in a changing ecosystem – how should we evaluate tradeoffs between current environmental impact and project longevity? What long term target should we be shooting for, end goal? How far out do you plan (i.e. SLR scenario?)
4. How do we define a degraded wetland to justify thin layer placement of sediment. How do you prioritize wetlands for TLP, what does that look like?

Attendees were organized into small groups and rotated between each question (roving flipcharts), building on previous groups' responses. Moderators for each question summarized key takeaways once all groups provided input:

<u>Question 1 Summary</u>

What are your biggest concerns about sediment placement? What should be monitored? What does success look like? Do we need BMPs for sediment placement (e.g. suspended sediment control)? How to minimize impacts to adjacent habitats?

<u>Biggest Concerns</u>

Success uncertainties were identified as a primary concern with TLP projects. Attendees noted that in some cases, TLP could do "more harm than good" especially if there is a lack of regulatory oversight once projects are implemented. As a result, it is necessary to develop an adaptive permitting framework that would be responsive to lessons learned.

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Some attendees were concerned about effectively matching sediment types between dredged and placement sites. Likewise, there was concern about the impacts of contaminated sediments (e.g., heavy metals, forever chemicals, etc.) on placement sites and associated risks to fish, wildlife, and public health.

Lastly, attendees expressed concern over the potential loss of wetland function once sediments are placed (e.g., loss of SAV and fish habitat, introduction of invasive species such as *P. australis* or nutria).

Monitoring and Success Considerations

Attendees identified several parameters that could be monitored once sediment is placed on an existing wetland. These parameters could be validated with the NC Wetland Assessment Method (NCWAM) and the Uniform Mitigation Assessment Method (UMAM). Generally, attendees agreed that choosing what to monitor should be dependent on specific success criteria and may include some or all the following:

- Vegetation abundance and recovery, including invasive species
- Recovery and response of invertebrate, bird, fish, and reptile species
- Hydrology
- Elevation
- Funding costs
- Water quality and turbidity
- Soil chemistry, microbiome pre- and post-application
- Ecosystem services (e.g., reduced flooding, economic assessment)

Attendees stressed the importance of securing reliable funding for long-term post-construction monitoring, which could be a barrier to success. Likewise, attendees identified the need to develop standard operating procedures (SOPs) for monitoring to ensure consistency across projects (e.g., establishing relevant monitoring durations, identifying appropriate control and reference sites, etc.). These SOPs should account for potential site recovery time, impacts from storm events, environmental work windows, and marsh growing seasons. Some attendees agreed that SOPs should also require monitoring and mitigation for any temporary habitat and species impacts associated with wetland mats, pipelines, or other construction activities. As such, adaptive best management practices (like those typically used for stormwater and sediment and erosion control) should be integrated into TLP monitoring plans. Collectively, these factors would help restoration practitioners develop appropriate budgets and timelines for effective monitoring once projects are complete.

According to workshop attendees, TLP could be considered successful if there is evidence of consistent sediment placement and containment across the marsh surface, adequate post-construction tidal flow, and benefits that exceed financial and ecological costs. Successful projects are also those that evaluate public perception and demonstrate a return on investment.

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Minimizing Impacts to Adjacent Habitats

To minimize impacts to adjacent habitats, attendees recommended that initial sediment placement should occur in less sensitive habitats (e.g., avoiding primary nursery areas, SAV, open shell fishing waters, outstanding resource waters, etc.) or areas within larger marsh systems. Attendees also recommended coupling TLP with other nature-based approaches (e.g., living shorelines) to develop a more holistic restoration strategy that incorporates the protection of adjacent habitats.

Question 2 Summary – Information Needs

What do we need more information on to use sediment placement to increase marsh resilience?

Attendees identified a suite of factors that need careful attention before TLP is used to enhance marsh resilience to sea level rise. They were broadly categorized as follows:

- Sediment contaminants and establishing acceptable thresholds
- Acceptable habitat trade-offs and adaptive management
- Evidence of need
- Sediment characteristics and texture
- History of wetland loss and future trends (couple with marsh migration efforts)
- Tidal, geomorphological, and hydrological information
- Projections of outcomes / modeling
- Detailed site mapping (elevation, soil and vegetation types, archaeological surveys)
- Additional demonstration and pilot studies
- Frequency of repeat sediment applications
- Current ecological and economic function of any given marsh system

Question 3 Summary

These projects are happening in a changing ecosystem – how should we evaluate tradeoffs between current environmental impact and project longevity? What long term target should we be shooting for, end goal? How far out do you plan (i.e. SLR scenario?)

Evaluating Trade Offs

Attendees highlighted the need to evaluate acceptable trade-offs relative to project-specific purpose and need. For example, trade-offs are different for projects that aim to either restore or create new habitat. Like environmental impact statements required for large projects, TLP proposals should consider an array of action alternatives, including the "no action" alternative, when evaluating acceptable trade-offs. In some cases, no intervention and the subsequent conversion of intertidal to subtidal habitat could be most appropriate. In areas with adequate natural sediment supply and undeveloped corridors, facilitating natural marsh migration may be most appropriate and cost-effective.

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Attendees also discussed trade-offs between TLP and public trust rights. For example, sediment placement that results in the fill of canals or ditches or in the creation of new upland habitats may eliminate navigable waters and public trust resources. As such, it is important to consider TLP success relative to community and stakeholder benefits. One attendee noted that if TLP results in the creation of new upland areas, conditions should be in place to prevent new development on those areas.

Long Term Planning Scenarios

In North Carolina, the life span of TLP projects and the associated ecosystem services they provide would most likely be determined by several location-specific factors such as current and future rates of sea level rise, the ability to match dredge frequency and sediment availability to marsh vulnerability (e.g., number of applications needed), the time frame in which a restored marsh reaches equilibrium and recovers post-construction, and the potential for future development and subsequent barriers to marsh migration. Attendees cautioned that using sea level rise alone to justify TLP could result in the "convenient disposal" of dredged material. As emphasized throughout the workshop, it is therefore necessary to consider a variety of factors that specifically target the restoration of deteriorating wetlands. In some cases, wetland loss may be driven by other stressors such as boat wakes and wave impacts. Wetlands susceptible to multiple stressors could benefit from protective measures other than TLP such as wave attenuating structures.

Lastly, attendees compared long-term TLP planning and implementation to beach nourishment and prescribed burns. Attendees suggested that once established, TLP could be incorporated into local resiliency plans to garner additional public support and funding from municipalities. Compared to beach projects, wetland change is typically slower and less obvious which could impact public perception or support. However, stakeholders could show a higher risk tolerance with TLP and associated uncertainties since candidate areas for sediment placement comprise a relatively small fraction of total wetland area across the state.

Question 4 Summary – Prioritizing Wetlands for TLP

How do we define a degraded wetland to justify thin layer placement of sediment. How do you prioritize wetlands for TLP, what does that look like?

Attendees agreed that characterizing a wetland as "degraded" may not be the most effective way to determine whether a site is a good candidate for TLP. Instead, practitioners should consider wetlands that are "at risk" of vegetation loss and ponding while also accounting for factors such as a site's proximity to existing infrastructure, the proposed dredge area and established migration corridors. Attendees also emphasized that just because a marsh is near a dredge area does not automatically make it a good candidate for TLP.

Evaluating regional status and trends of existing marshes is particularly important (e.g., natural conditions, future change, tidal ranges, salinity, ecology). For example, a highly developed region with many barriers

to natural marsh migration (e.g., New Hanover County) may not benefit from TLP as much in the long-term compared to scarcely developed regions with higher migration potential (e.g. Hyde County). On the other hand, more developed regions could benefit more in the short term since options to enhance resilience are limited.

Conclusion and Next Steps

When evaluating the implementation of and trade-offs associated with TLP in North Carolina, workshop attendees highlighted the importance of clearly identifying the goals, objectives, purpose and need for these projects on a case-by-case basis – rather than as a catch-all approach – while considering the above topics on a specifically defined local or regional scale. As a result, a collaborative multi-agency network of stakeholders is most likely needed to progress TLP in a responsible manner.

The information gained from this workshop will be incorporated in and directly inform the 2026 CHPP amendment. TLP will be addressed as a stand-alone issue paper within the proposed Planning for Wetland Change thematic area. This paper will synthesize the best available science and guidance related to TLP, identify research needs and knowledge gaps, discuss policy, permitting, and regulations, and highlight concerns and best practices related to TLP that may collectively inform next regulatory steps and identifying priority areas where TLP may be successful in North Carolina.

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SUBAPPENDIX A: WORKSHOP ATTENDEES

First Name	Last Name	Organization
Aaron	Bunch	The Nature Conservancy
Abby	Williams	NC Coastal Reserve and NERR
Ana	Zivanovic-Nenadovic	North Carolina Coastal Federation
Anne	Deaton	NOAA National Marine Fisheries Service
April	Hall	NC Coastal Federation
Billy	Standridge	US Army Corps of Engineers
Brandon	Puckett	NOAA National Centers for Coastal Ocean Science
Byron	Toothman	NC Coastal Reserve and NERR
Caroline	Causey	US Fish and Wildlife Service
Carolyn	Currin	EA Engineering, Science, and Technology
Cat	Bowler	Audubon North Carolina
Catherine	Otero	NC Division of Water Resources
Cathy	Brittingham	NC Division of Coastal Management
Charlie	Deaton	NC Division of Marine Fisheries
Claire	Rapp	NC Coastal Federation
Daniel	Govoni	NC Division of Coastal Management
Derek	Detweiler	NC Division of Marine Fisheries
Emily	Hughes	US Army Corps of Engineers
Gregg	Currey	US Army Corps of Engineers
Gregg	Bodnar	NC Division of Coastal Management
Jacob	Boyd	NC Coastal Federation
Jenny	Davis	NOAA National Centers for Coastal Ocean Science
Jonathan	Lucas	NC Division of Coastal Management
Justin	Ridge	NC Coastal Reserve and NERR
Kate	Jones	NC Dept. of Natural and Cultural Resources
Kelsey	Beachman	Division of Coastal Management
Kristina	Hellinghausen	NC Division of Water Resources
Lisa	Wickliffe	NOAA National Marine Fisheries Service
Mary	Plummer	NC Dept. of Natural and Cultural Resources
Melanie	Flood	NC Natural Heritage Program
Michael	Meilinger	NC Division of Water Resources
Michael	Schafale	NC Natural Heritage Program
Michelle	Brodeur	NC Division of Marine Fisheries
Michelle	Moorman	US Fish and Wildlife Service
Molly	Bost	NOAA National Centers for Coastal Ocean Science
Paula	Gillikin	NC Coastal Reserve and NERR
Richard	Mahoney	NC Division of Coastal Management
Sara	Ward	NC Dept. of Natural and Cultural Resources
Sarah	Marschhauser	Audubon North Carolina

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Shane	Staples	US Army Corps of Engineers
Stephen	Lane	NC Division of Coastal Management
Trish	Murphey	NC Division of Marine Fisheries
Whitney	Jenkins	NC Coastal Reserve and NERR
Zach	Harrison	NC Division of Marine Fisheries

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SUBAPPENDIX B: WORKSHOP AGENDA

Thin-Layer Placement Coordination Workshop

to inform the Coastal Habitat Protection Plan (CHPP) update

Thin-layer placement of sediment (TLP) is a strategy to restore or maintain a tidal marsh's elevation relative to sea level, to support marsh resilience. The approach leverages a marsh's natural ability to withstand large, storm-driven sediment deposits. TLP mimics this natural process by applying layers of sediment, often dredged material, to the marsh's surface.

Date: Monday, March 30, 2026

Location: Duke University Marine Lab, Repass Lecture Hall, 135 Duke Marine Lab Rd, Beaufort NC 28516

Time: 10:00am - 3:00pm

Target audience: Resource agencies, researchers, restoration practitioners

Workshop Objectives – Participants will:

- Share and discuss the latest Thin-Layer Placement of sediment (TLP) research and project implementation best practices,
- Discuss state policies and challenges in assessing project proposals, and
- Identify information needs to inform policy and permitting.

Workshop Outcomes:

- Regulatory agencies can better assess the purpose, need, and habitat impacts/tradeoffs from proposed TLP projects,
- Researchers understand knowledge gaps and connect with restoration practitioners for potential study sites, and
- Resource managers incorporate perspectives presented into planning and policy through the CHPP.

Agenda

Time	Item
9:30am	Workshop check-in
10:00am	Welcome & Introductions
10:15am	TLP Research Overview – Jenny Davis, NOAA
10:55am	15-minute break
11:10am	Resource agency panel via Zoom • Sarah Bouboulis, DE Department of Natural Resources and Environmental Control • Tyler Kinney, NJ Department of Environmental Protection • Maggie Cavey, MD Department of Natural Resources

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	• Jan Mackinnon, GA Department of Natural Resources
12:10pm	TLP – Tasty Lunch Provided! Thank you, NC Coastal Federation!
1:00pm	Small group discussion • What are your biggest concerns about sediment placement? • What do we need more information on to use sediment placement to increase marsh resilience? • These projects are happening in a changing ecosystem – how should we evaluate tradeoffs between current environmental impact and project longevity? • How do we prioritize wetlands for thin-layer placement of sediment?
2:45pm	Action Items & Next Steps
3:00pm	Adjourn

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SUBAPPENDIX C: STATE RESOURCE AGENCY PANELIST SLIDES

to be added to final PDF

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Submerged Aquatic Vegetation Protection and Restoration

Executive Summary

North Carolina's coastal waters have historically supported nearly 200,000 acres of submerged aquatic vegetation (SAV), which provides critical spawning, foraging, and nursery habitat for most of North Carolina's fisheries, and provides additional ecosystem services including carbon sequestration, nutrient filtering, and sediment stabilization. However, degraded water clarity, sea level rise, and rising temperatures represent growing threats to SAV across the state, with rates of habitat loss currently exceeding 1% per year, plus increasing conversion of continuous meadows to patchy SAV beds. The 2021 CHPP set a statewide goal of ensuring a SAV extent of 191,155 acres and recommended new and updated water quality standards to ensure adequate light penetration to allow SAV to regrow in areas where poor water clarity has led to its loss. To ensure progress on slowing the rate of SAV loss across the coast, this CHPP highlights the need to continue to advance a water clarity standard to protect SAV, outlines an approach for a habitat-based rulemaking framework for the MFC to implement additional SAV protections, and summarizes the regulatory framework and ecological and practical concerns for future seed- and transplant-based SAV restoration projects.

Part 1: Background and water quality improvements to protect and restore SAV

Introduction

North Carolina (NC) is home to one of the most productive and biodiverse submerged aquatic vegetation (SAV) resources on the Atlantic seaboard, including the largest polyhaline and mesohaline seagrass meadows in the temperate western Atlantic (Thayer et al. 1984; NCDEQ 2016). SAV habitat is the foundation for ecological services that directly benefit the coastal ecosystems of North Carolina, including primary and secondary fisheries production, habitat for fish, wildlife and waterfowl, sediment and shoreline stabilization, wave energy attenuation, water purification, and carbon sequestration (Mtwana Nordlund et al. 2016). All these services are important to ecosystem health and provide increased community and ecosystem resilience (NCDEQ 2020). Resource valuation studies indicate that the monetary value of the ecosystem services provided makes SAV habitat protection and restoration a priority conservation and management issue (Costanza et al. 1997; Barbier et al. 2011; Sutherland et al. 2021). In addition to its contributions to coastal resilience and economic production, SAV also provides cultural

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value and contributes to human wellbeing for local coastal communities and residents globally, making it an integral part of coastal socio-ecological systems (Cullen-Unsworth et al. 2013).

Submerged aquatic vegetation includes marine, estuarine, riverine and lacustrine vascular plants that are rooted in unconsolidated sediment. Because SAVs are rooted in anaerobic sediments, they need to produce a large amount of oxygen to aerate the roots and therefore have the highest light requirements of all aquatic plants (Stevenson 1988; NCDEQ 2016). SAV can become stressed by eutrophication and other environmental conditions that impair water transparency and/or diminish the oxygen content of water and sediments. The plant's response to these factors makes them a sensitive bio-indicator of environmental health (Dennison et al. 1993; Biber et al. 2008). There are two distinct groups of SAV habitats in NC distributed according to water salinity. One group thrives in fresh and low salinity riverine waters (<10 ppt), referred to as low salinity SAV. The second group occurs in the moderate to high (>10 ppt) salinity estuarine waters of the bays, sounds, and tidal creeks, referred to as high salinity SAV or seagrasses.

These groups are distinguished by different species composition and environmental requirements, and they have characteristics similar to SAV communities found in many other estuaries in the US (Table 1) (Stevenson 1988; Orth et al. 2017). Low salinity SAV includes southern naiad (*Najas guadalupensis*), coontail (*Ceratophyllum demersum*), horned pondweed (*Zannichellia palustris*), naiads (*Najas* spp.), redhead grass (*Potamogeton perfoliatus*), sago pondweed (*Stuckenia pectinata*), slender pondweed (*Potamogeton pusillus*), water stargrass (*Heteranthera dubia*), water starwort (*Callitriche heterophylla*), waterweeds (*Elodea* spp.), wild celery (*Vallisneria americana*), and two non-native species, Eurasian milfoil (*Myriophyllum spicatum*) and hydrilla (*Hydrilla verticillata*). High salinity SAV includes eelgrass (*Zostera marina*), shoal grass (*Halodule wrightii*), and Widgeon grass (Ruppia maritima), a eurytolerant species that grows best in moderate salinity areas.

Table 1. Average environmental requirements at locations where submerged aquatic vegetation (SAV) occurred in coastal NC, 1988-1991 (Thayer et al. 1994).

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	Environmental parameter					
	Salinity (ppt)		Secchi depth m (ft)		Water depth m (ft)	
SAV species	Range	Average	Range	Average	Range	Average
HIGH SALINITY (<10-30 ppt)						
Eel grass (*Zostera marina*)	10 ≥ 36	26	0.3 - 2.0 (1.0 - 6.6)	1.0 (3.3)	0.4 - 1.7 (1.3 - 5.6)	1.2 (3.9)
Shoal grass (*Halodule wrightii*))	8 ≥ 36	25	0.4 - 2.0 (1.3 - 6.6)	1.0 (3.3)	0.1 - 2.1 (0.3 - 6.9)	0.8 (2.6)
Widgeon grass (*Ruppia maritima*)	0 - 36	15	0.2 - 1.8 (0.7 - 5.9)	0.7 (2.3)	0.1 - 2.5 (0.3 - 8.2)	0.8 (2.6)
FRESHWATER-LOW SALINITY (0-≥10 ppt)						
Redhead grass (*Potamogeton perfoliatus*)	0 - 20	1	0.4 - 1.4 (1.3 - 4.6)	0.9 (3.0)	0.4 - 2.4 (1.3 - 7.9)	0.9 (3.0)
Wild celery (*Vallisneria Americana)*	0 - 10	2	0.2 - 2.0 (0.7 - 6.6)	0.6 (2.0)	0.2 - 2.3 (0.7 - 7.6)	1.0 (3.3)
Eurasian watermilfoil (*Myriophyllum spicatum*)	0 - 10	2	0.2 - 1.4 (0.7 - 4.6)	0.6 (2.0)	0.5 - 2.4 (1.6 - 7.9)	1.1 (3.6)
Bushy pondweed (*Najas guadalupensis)*	0 - 10	1	0.2 - 2.0 (0.7 - 6.6)	0.7 (2.3)	0.5 - 1.7 (1.6 - 5.6)	1.0 (3.3)
Sago pondweed (*Stuckenia pectinate*)	0 - 9	2	0.2 - 0.4 (0.7 - 1.3)	0.3 (1.0)	0.6 - 0.9 (2.0 - 3.0)	0.8 (2.6)

High Salinity SAV Extent and Distribution

SAV mapping was conducted by DMF and partners in 2021 from Bogue Inlet south to Carolina Beach, and that survey is now included in the statewide SAV "mosaic" dataset, which includes all available aerial surveys from 1981 to 2021. Additional mapping of SAV beds from Bogue Inlet north to Roanoke Island that occurred from 2021-2025 will be available in the near future. However, the bigger-picture trends in SAV habitat are expected to be generally comparable to those previously reported, with rates of loss of SAV extent on the order of approximately 1% per year over a 30-40 year timespan, though with spatial variability in rates of loss. While extensive new mapping is currently unavailable, APNEP released a 2nd edition metric report on the *Extent and Distribution of Submerged Aquatic Vegetation in High Salinity Estuarine Waters* (Field et al. 2026), which analyzed the changes in high-salinity SAV meadows documented across three survey periods occurring in 2006-2007, 2013, and 2020.

In North Carolina, high salinity SAV is predominantly eelgrass (*Zostera marina*) and shoal grass (*Halodule wrightii*) with widgeon grass (*Ruppia maritima*) having a relatively lower (< 10%) abundance (Bartenfelder et al. 2022). In North Carolina, seasonal temperature variability exposes the temperate seagrass *Zostera marina* and the tropical seagrass *Halodule wrightii* to periods of both favorable and stressful thermal conditions (Thayer et

al., 1984; Short et al., 2016; Bartenfelder et al., 2022). During summer, water temperatures exceed the thermal optimum of *Z. marina* (≥ 25°C up to three months), increasing respiratory demand and light requirements, resulting in seasonal declines in abundance (Zimmerman et al., 1989; Biber et al., 2008; Bartenfelder et al., 2022). Additionally, warming water temperatures in the region have extended the duration of *Z. marina*'s stressful season from 84 to 156 days between 1962 and 2019 (Bartenfelder et al., 2022). Although warmer water temperatures could increase habitat suitability for the tropical species *H. wrightii* to expand (Hyndes et al., 2016; Pinsky et al., 2020), the species has not increased in abundance or colonized areas of *Z. marina* loss, specifically at the meadow deep edge (Field et al. 2021; Bartenfelder et al., 2022). The lack of expansion is likely a result of annual winter water temperatures consistently occurring below the thermal optimum of *H. wrightii* (≤ 20°C up to three months), reducing metabolic performance required to sustain photosynthesis and limiting annual growth (Stevenson et al., 2025; Wheeler et al. 2025; Lytle et al. 2026). Together, these patterns indicate that both species are constrained by opposing thermal stressors that impact their life cycles. These contrasting thermal sensitivities highlight uncertainty in how seagrass meadow composition and structure will respond to continued climate change trajectories (Chefaoui et al., 2018; Kunkel et al., 2020; Pinskey et al., 2020).

APNEP conducted aerial surveys to map high-salinity SAV distribution along the coast from Roanoke Island south through Bogue Sound. Seagrass extent was mapped as continuous (>70% cover) or patchy (>10% and <70% cover), with a minimum mapping unit of approximately 0.2 ha and rasterized 2 m pixel size. Comparison of seagrass extent was limited to areas with interpretable imagery in subsequent surveys (e.g. areas uninterpretable in 2020 were removed from maps from 2007-2007 and 2013 for comparison), so figures do not represent all seagrass mapped. Across the survey range, of the originally mapped high salinity SAV extent of 99,398 acres in 2006 – 2007 (Figure 1) declined to 83,269 acres in 2020, representing a loss of 16,129 acres over the 14-year period, or a loss of 16.2%, or 1.16% per year (Figure 2) The extent of continuous meadows decreased by approximately 50%, from 44,978 to 20,804 acres, while patchy seagrass meadow extent increased approximately 15%, from 54,420 to 62,465 acres, indicating that not only is seagrass extent in North Carolina declining, but seagrass cover is also shifting toward more patchy and fragmented meadows.

The APNEP aerial survey data are divided into three regional zones: 1) the "North Zone" from the U.S. Highway 64 Bridge at Roanoke Island to Hatteras Inlet, 2) the "Central Zone" from Hatteras Inlet to Barden Inlet near Cape Lookout, and 3) the "South Zone" from Barden Inlet to Bogue Inlet (Figure 1). Spatial patterns of seagrass change over the 14-year period varied by region (Figure 2). In the Northern Zone, which contains the largest seagrass

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extent, most losses occurred along the outer western edges of patchy beds on the back-barrier shelf. In the Central Zone, much of the change reflected a transition from continuous to patchy meadows along the deep-water edge of the back-barrier shelf and on flood tidal shoals around Hatteras and Ocracoke Inlets. In contrast, the Southern Zone exhibited both gains and losses, with substantial seagrass expansion in western Bogue Sound and declines in the eastern portion of the zone. Northern and Central Zones surveyed lost seagrass extent, with regional rates of loss reaching as much as 3.08% per year in subareas from Drum Inlet to Hatteras Inlet. The APNEP report notes that the Chesapeake Bay and Indian River Lagoon both experienced substantially larger losses of seagrass over the same time period, but the seagrass loss reported in NC is on par with globally reported rates of seagrass declines (Dunic et al. 2021).

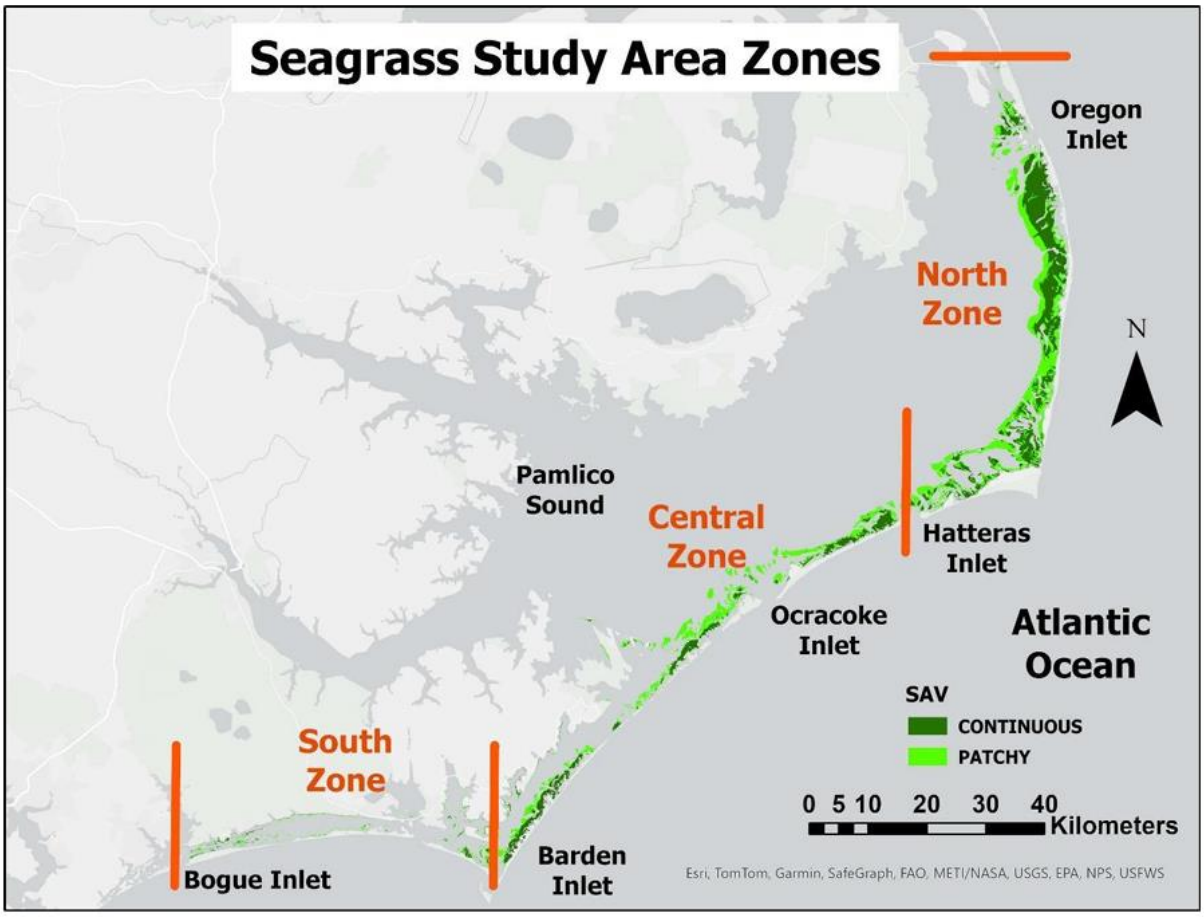


Figure 1. The three regional zones for the high salinity aerial surveys: 1) the “North Zone” from the U.S. Highway 64 Bridge at Roanoke Island to Hatteras Inlet, 2) the “Central Zone” from Hatteras Inlet to Barden Inlet near Cape Lookout and, 3) the “South Zone” from

Barden Inlet to Bogue Inlet. The high salinity SAV mapped in the figure is from interpretation of the 2006/2007 imagery (Field et al. 2026).

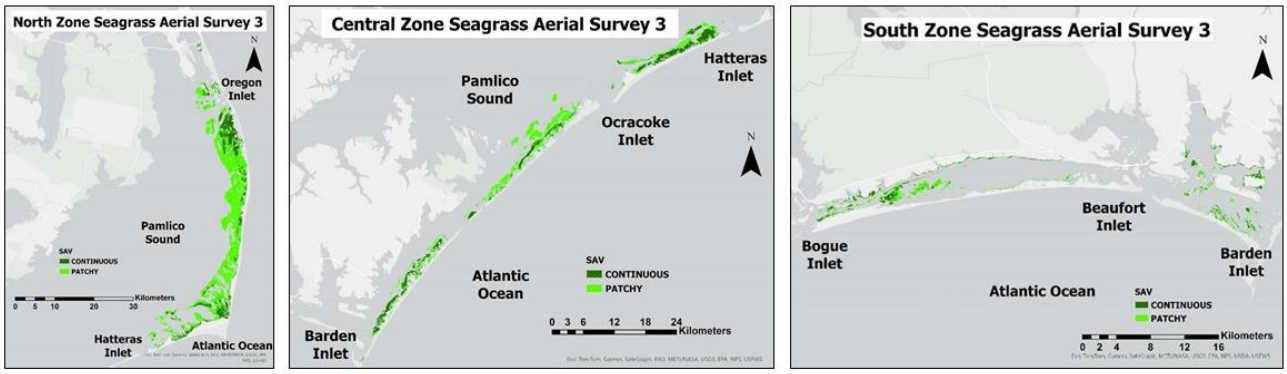


Figure 2. The three zones for the high salinity monitoring from Survey 3 (2020) imagery interpretation. Colors demote the SAV location and spatial cover classes (continuous and patchy). Modified from Field et al. 2026.

The APNEP mapping analysis highlights that a common area of loss was at the deeper-water edge of the seagrass meadows, which are generally also exposed to the largest fetch and wave energy. Seagrass growing at the deep edge of the beds is likely growing at or near the threshold of light limitation, so loss in this area can also be driven by sea level rise and poor water clarity. Increasing water temperatures also exacerbate the impacts of light limitation, especially for eelgrass, which is already growing near its thermal tolerance in North Carolina and has experienced documented long-term declines in Back Sound (Bartenfelder et al 2022 MEPS). Flood tidal deltas at Hatteras and Ocracoke Inlets experienced large losses of seagrass extent, associated with the widening of both inlets, shifting of sand shoals, and notably Hurricane Dorian in 2019, which produced a large storm surge in north Core Sound and southeastern Pamlico Sound.

The reported reductions in seagrass habitat over the past 14 years reflect the multi-decadal patterns of loss noted in previous CHPPs, and this ongoing pattern emphasizes the need for management action to protect North Carolina's remaining SAV habitat and restore the meadows that have been lost. It is important to manage the threats within the domain of existing management paradigms, including sediment and nutrient loading, water quality, and land use, but given the threats posed by climate change, new approaches will need to be developed to mitigate the impacts of increased storminess, rising temperatures, and sea level rise. While the 2021 CHPP set a statewide SAV acreage goal of 191,155 acres, of which 149,427 acres is high-salinity SAV, based on seagrass extent mapped from 1981-

2015. The APNEP report recommends an interim target for high salinity SAV extent of 109,167 acres, representing the seagrass extent mapped in 2006-2007, as such a target may be more immediately achievable. Finally, while over 16,000 acres of seagrass meadows were lost between 2006 and 2020, at least some of that lost acreage remains viable seagrass habitat that can be repopulated as long as management practices preserve the environmental conditions that sustain persistent seagrass meadows and promote their reestablishment.

Low Salinity Extent and Distribution

The Currituck Sound and Back Bay, Albemarle Sound, and Tar-Pamlico and Neuse Rivers regions are home to North Carolina's low salinity SAV. The known historical extent of low salinity SAV mapped in NC, from 1981 – 2015 is 39,066 acres or 20.4% of the state's total SAV extent (NCDEQ 2021). Mapping and monitoring low salinity SAV is more difficult due to low water clarity compared to the areas of the estuary where high salinity SAV grows. Despite low water clarity and limited availability of historical baseline data of low salinity SAV habitat, fluctuations in SAV abundance have been observed through hydroacoustic surveys and other sentinel site observations (Speight 2020; APNEP 2020). Comparing alongshore hydroacoustic surveys conducted 2014-2017 to the historical extent of SAV (from the 1981-2015 SAV mosaic dataset, though the earliest surveys contained in that dataset for the low salinity regions date to 1990), approximately 33 percent of the linear extent of low-salinity SAV was estimated to have been lost (APNEP 2020).

The 2026 amendment to the CHPP proposes three strategies going forward to support SAV protection:

1. Completion of the recommendation from the 2021 CHPP amendment for the EMC to be presented with a water quality standard for light penetration, along with continuation of the other recommended actions to improve water quality for SAV.
2. Outlining the permitting process for active SAV restoration where conditions may be supportive of long-term reestablishment through seeding or transplantation.
3. A plan for developing comprehensive management options for SAV protection from physical disturbance under the authority of the MFC, in accordance with the MFC's request during implementation of Amendment 2 to the Shrimp Fishery Management Plan.

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Continued work on water quality improvements to protect and restore SAV

Chapter 4 of the 2021 CHPP amendment (NCDEQ 2021) explored the declines in SAV statewide and illustrated the connections to decreased water clarity, in addition to describing the component factors driving this reduction, with a focus on chlorophyll (driven by nutrient input), but also including turbidity and chromophoric dissolved organic matter (CDOM) (Hall, 2022). The 2021 CHPP amendment recommended 13 actions under the theme of *Protection and Restoration of Submerged Aquatic Vegetation (SAV) through Water Quality Improvements*, with a heavy emphasis on establishing water clarity solutions through new and/or improved water quality standards. As underwater plants, SAV species require waters to be clear enough for sunlight to penetrate the water column during the growing season, and light availability typically limits the depth at which SAV can grow. Required light conditions vary by species; low salinity SAV species have slightly lower light requirements of > 9 percent of surface incident light required at the leaf and >13 percent of surface incident light required through the surface, compared to >15 percent and >22 percent, respectively, for species found in moderate to high salinity areas (Kemp et al. 2004; Funderburk et al. 1991; USEPA 2003). These biological light requirements, along with modeling by Hall (2022), formed the basis of the 2021 CHPP Amendment's recommendation for a light penetration (clarity) standard to protect and restore SAV. A study conducted in 2022 (Lytle et al. 2026) evaluated light availability relative to the 2021 CHPP amendment recommendation of a 22% surface irradiance threshold for high-salinity SAV up to depths of 1.7 m. During a three-week study conducted in a seagrass meadow in Back Sound between August and September, observed light availability was 14 percent surface irradiance at 1.0 m depth, with an estimated 9.8 percent surface irradiance reaching 1.7 m, substantially below the recommended threshold. These data highlight the need to continue to characterize the light conditions currently experienced by SAV habitats across North Carolina to inform efforts to improve water clarity for SAV restoration.

Efforts to reduce algal blooms and chlorophyll a impairments in North Carolina's estuaries have been ongoing for over 20 years, to mixed results. The NC Division of Water Resources' Nonpoint Source Planning Branch's draft *20-Year Neuse and Tar-Pamlico Nutrient Management Strategy Retrospective* (NCDWR 2023) provides an overview of the history and progress of nutrient management in the two primary watersheds that impact the Pamlico Sound estuary, including a large portion of the state's SAV habitat, from the early 2000s to the early 2020s. Among the preliminary findings are that (a) progress on nutrient reduction has been mostly limited to point source improvements, and that the increase in organic nitrogen loads has offset the nitrogen loading reductions achieved from point

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sources; (b) loading from developed lands has approximately doubled, while loading from cropland has not substantially decreased; and (c) agricultural lands dominate nutrient loading in high precipitation years, while urban areas dominate in low precipitation years, indicating that both agricultural and urban sources must both continue to be addressed to protect downstream environments.

The impacts of climate change threaten to exacerbate water clarity issues as rainfall patterns change. According to North Carolina's 2020 Climate Science Report (Kunkel et al. 2020), the intensity of the strongest hurricanes is likely to increase with warming temperatures, which will result in increased heavy precipitation from hurricanes impacting NC. Additionally, it is likely that the frequency of severe thunderstorms and the annual total precipitation in NC will increase. The expected increase in heavy precipitation events will lead to increased runoff from both agricultural and developed lands, which will result in an increase in nutrients, sediments, and other pollutants carried to North Carolina's estuaries. Paerl et al. (2019) analyzed rainfall records from coastal NC going back to 1898, and their findings suggest that this increase in precipitation and pollutant delivery to estuaries has already begun. Specifically, they found "a period of unprecedentedly high precipitation since the late-1990's, and a trend toward increasingly high precipitation associated with tropical cyclones over the last 120 years," and that those changes represent "a recent regime shift with major ramifications for hydrology, carbon and nutrient cycling, [and] water and habitat quality." As the magnitude and frequency of rainfall and storm events increase, it will be even more important for state agencies to implement policies that encourage the use of agriculture, forestry, and urban stormwater best management practices (BMPs) and explore complementary regulatory updates to reduce the amount of runoff reaching North Carolina's estuaries. Each edition of the CHPP has emphasized the need for increased use of BMPs, along with other actions to improve water quality, and increased implementation will be necessary to mitigate the impacts from anticipated climatic changes.

The 2021 CHPP amendment recommended 3 incrementally progressive regulatory solutions to be brought to the EMC: (1) a clarity standard to protect SAV, (2) an update to the existing chlorophyll standard to address deficiencies in the standard and its assessment, and (3) nitrogen and phosphorus standards. While not accomplished in the ambitious timeframes initially proposed, the 2021 CHPP recommendations for water quality improvements to protect and restore SAV habitat remain DEQ's top priorities to advance SAV protection and restoration coastwide.

Since the 2021 CHPP amendment's passage, the Scientific Advisory Council (SAC) to the Nutrient Criteria Development Plan (NCDP) made a recommendation for a clarity standard

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that included the photosynthetically active radiation (PAR) extinction coefficients (K_dPAR) recommended in the 2021 CHPP amendment of 1.36 m^{-1} for low-salinity SAV (allowing for 13% of incident light to reach 1.5 m depth) and 0.89 m^{-1} for high-salinity SAV (allowing for 22% of incident light to reach 1.7 m depth), applied across a growing season of March through October to areas that are currently or have historically been vegetated by one or more of the 14 species identified in the MFC definition of SAV habitat (15A NCAC 03I .0101(4)(i)(i)). The NCDP SAC reviewed presentations on chlorophyll in their final few meetings, however the SAC's appointment concluded without action on either updates to the chlorophyll standard or new nitrogen and phosphorus standards.

Following the conclusion of the SAC's appointment, DWR NCDP staff developed the SAC's recommendation into a draft water clarity standard, which was presented to the Criteria Implementation Committee (CIC). CIC member feedback was solicited as a group and in one-on-one meetings, and NCDP staff have been developing a regulatory impact analysis (commonly referred to as a fiscal note) in accordance with NCGS § 150B-21.4 to identify, describe, and quantify the expected effects of the proposed standard to the extent possible. Upon completion of the fiscal note, DWR staff will complete the rulemaking package and present the draft standard to the EMC, with a vote on the standard anticipated in 2027.

While passage of a water clarity standard protective of SAV would mark a comprehensive approach to reversing the decline of North Carolina's SAV habitat, the earliest initiation of restoration activities in clarity-impaired waterbodies will likely take at least 8-10 years after passage of the standard, accounting for standard implementation, monitoring and assessment, development of restoration plans, and on-the-ground restoration projects.

In public meetings since passage of the 2021 CHPP amendment, commercial and recreational fishing stakeholders have made clear their frustration with continued declines in water quality and the impacts of those declines on fish and fish habitats. Accordingly, this CHPP amendment recommends continuing to prioritize progress on the recommended actions from the 2021 CHPP amendment to improve water quality for SAV, specifically that DMF, DWR, and partners should continue to collaborate in facilitating the adoption of a water clarity standard to protect SAV. Additionally, in acknowledgment of the long timeframe anticipated to achieve comprehensive water clarity solutions for SAV, this CHPP amendment provides guidance for further SAV protection and restoration measures that, while less wide-ranging, still represent meaningful steps that can be taken to slow the rate of coastwide SAV loss. Specifically, this CHPP amendment explores the range of SAV protections that may be available under the authority granted to the Marine Fisheries Commission, and this amendment also lays out the permitting framework, best practices,

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and next steps for active restoration of SAV habitat across North Carolina's coast. The approaches present additional tools for DEQ and partner organizations to work with while long-term solutions to the threats to SAV from water quality degradation are simultaneously addressed.

Recommended Action

DMF, DWR, and partners should continue to prioritize progress on the recommended actions from the 2021 CHPP amendment to improve water quality for SAV, especially by collaborating to facilitate the passage and implementation of a water clarity standard to protect SAV.

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Part 2: Submerged Aquatic Vegetation Restoration

This paper synthesizes the state of active submerged aquatic vegetation (SAV) restoration as it bears on management decisions in North Carolina, summarizes the regulatory framework currently governing active SAV restoration in state waters, and notes practical and ecological concerns to address before attempting or permitting active SAV restoration. While this issue paper does not attempt to summarize restoration methods (e.g., transplant unit design, anchoring techniques, or seed handling), researchers and practitioners are directed to the manuals cited below and others.

Background

North Carolina estuaries support SAV across a wide salinity range, broadly grouped into high-salinity communities of polyhaline and mesohaline waters (dominated by eelgrass *Zostera marina*, shoal grass *Halodule wrightii*, and widgeon grass *Ruppia maritima*) and low-salinity communities of the oligohaline and tidal freshwater rivers and sounds (dominated by wild celery *Vallisneria americana*, sago pondweed *Stuckenia pectinata*, pondweeds *Potamogeton* spp., and other freshwater taxa) along with the invasive hydrilla *Hydrilla verticillata*, which is widespread and in many areas the dominant low-salinity SAV by biomass. The two groups differ in species composition, dominant stressors, bed dynamics, and climate vulnerability. The presence of hydrilla complicates restoration planning in low-salinity systems both because of its competitive effects on native species and because of the herbicide treatments used to control it. Active restoration considerations, including donor sourcing and species suitability under changing conditions, may differ substantially between groups, and project planning should be informed by the ecological and management context of the relevant salinity zone.

Where water quality or physical impacts to SAV habitat have been mitigated but natural revegetation has not occurred, active placement of transplants or seeds can help overcome source and dispersal limitations that may prevent recovery. Active restoration is therefore distinct from the stressor-reduction actions (e.g., water clarity needs) addressed in Part 1 of this issue paper. Active restoration is most appropriate as a follow-up measure once underlying stressors have been removed or reduced, not as a mitigation for them. However, there may be localized areas where stressors are not as prevalent and active restoration can be considered despite water clarity measures not met within the broader geography.

In addition to benefits to fish and wildlife that depend on the habitat, SAV restoration presents an opportunity to restore lost blue carbon stocks. North Carolina's Coastal Habitat Greenhouse Gas Inventory (NC Coastal Habitat GHG Workgroup 2023) uses a

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single carbon sequestration rate for both patchy and continuous high-salinity seagrass meadows (-0.17 t C $acre^{-1}$ yr^{-1}; IPCC 2014), indicating that, based on North Carolina's 2021 mapped seagrass extent, statewide carbon sequestration in seagrass soils totaled 14.69 kt C yr^{-1}, or 55.14 kt CO_2eq yr^{-1}, though uncertainty in that estimate is poorly constrained. Key et al. (2026) found that continuous seagrass beds have higher carbon concentrations stored in their soils than discontinuous (patchy) seagrass beds (1.5-2.0% vs. 0.64-1.0% organic matter), and those sediments are more resistant to erosion and are better preserved by storm burial than discontinuous seagrass beds. These findings would suggest that restoration of lost seagrass beds, or of continuous beds that have become patchy, would increase both carbon sequestration rates and long-term storage of soil carbon in high-salinity seagrass habitats.

Under changing climate conditions, restoration planning may also need to account for shifting species suitability and consider the role of assisted migration. For example, eelgrass, which is near its southern thermal limit in North Carolina, is increasingly vulnerable to warming temperatures, whereas shoal grass is more heat-tolerant and may expand northerly under future conditions (Bartenfelder et al. 2022). In such cases, restoration efforts that incorporate climate-adapted species or genotypes may improve long-term persistence (e.g., Hoegh-Guldberg et al. 2008; van Katwijk et al. 2021).

A growing body of literature exists to inform SAV restoration practice. Guidance for U.S. seagrass restoration was set out in Fonseca et al. (1998), and the Chesapeake Bay SAV Restoration Manual (Jasinski et al. 2021) provides region-specific protocols developed in the most directly analogous Atlantic Coast system. More recently, Unsworth et al. (2025) discuss ten guiding principles for seagrass restoration, beginning with the principle that *protection* of extant meadows is more effective than replanting and that restoration is not a substitute for reducing the stressors that caused decline. The single most consistent finding across syntheses of seagrass restoration is that restoration is unlikely to succeed where the impacts that caused loss have not been mitigated, particularly when those impacts originate from degraded water quality. Van Katwijk et al. (2016), in a global meta-analysis of 1,786 restoration trials, found that sites previously impacted by reduced water quality (principally eutrophication) and by construction activities had poorer restoration outcomes than sites impacted by dredging, localized direct impacts, or natural causes. Persistent water-quality stressors are therefore a strong reason to postpone active restoration regardless of the techniques used.

Several factors are positively associated with restoration success. Van Katwijk et al. (2016) identified that larger planting efforts (number of plants or seeds), proximity to existing donor beds, and use of effective anchoring techniques are among the strongest factors for

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survival and population growth. Proximity to donor beds is generally interpreted as an indicator that the receiving environment is suitable for seagrass growth, but it may also reflect benefits from locally adapted genotypes and from shorter handling time between collection and planting. Recent work also points to potential benefits from microbial inoculation (Sun et al. 2024). However, with these successes the drawbacks must also be considered. The high salinity SAV species *Zostera marina* exhibits a mixed annual life-history strategy in which aboveground shoots senesce during summer and plants re-established each year from the seed bank that was established the year prior (Jarvis et al. 2012). *Z.marina's* dependence on annual seed recruitment makes seed production and seed bank persistence critical to the North Carolina population resilience. Consequently, restoration efforts that rely on harvested seeds must ensure seed collection does not deplete the limited seed reserves required for natural annual recovery of the species.

Van Katwijk et al. (2016) concluded that larger trials succeed more often than smaller ones, suggesting that plantings must reach a sufficient density and spatial footprint to overcome negative factors (e.g., sediment resuspension, grazing, hydrodynamic stress) and persist. In a synthesis of 82 eelgrass restoration projects conducted along the U.S. West Coast between 1989 and 2020 reinforce these conclusions (Ward and Beheshti 2023). Project failure rates were 32–60% depending on how success was defined, and the authors attributed the regional failure rate in part to the small scale at which most West Coast restoration has been conducted (a total of only ~85.5 ha across all 82 projects). Practitioners most often attributed failure due to environmental conditions such as algal blooms, sedimentation, and light limitation. This is consistent with Van Katwijk et al. (2016) finding that water quality and other persistent stressors are dominant causes of restoration failure. Ward and Beheshti (2023) also showed a substantial documentation gap (only 6 of 82 projects were peer-reviewed; few projects monitored ecosystem functions or maintained co-monitored reference sites. North Carolina will need to develop a standardized and well-documented monitoring approach for restoration sites. This approach will need to be accessible to practitioners and contain information that reports restoration sites, restoration efforts implemented, and restoration progress (success or failure) to inform future restoration decisions.

The contrast between eelgrass improvements or declines in Chesapeake Bay and the adjacent Virginia coastal bays on the Eastern Shore is an illustration of how stressor context determines restoration outcomes. Orth et al. (2009) reported that eelgrass beds in Chesapeake Bay, which had begun to recover from earlier diebacks, declined over the period 2000–2009. This was attributed to declining water quality as the main stressor as there was bay-wide dieback in 2005 associated with very high summer water temperatures and poor water clarity. Over the same period, eelgrass abundance increased substantially

DRAFT

in the Virginia coastal bays on the Eastern Shore, where a large-scale seed-based restoration program initiated in 2001 was able to take advantage of better water clarity and produced expanding, self-sustaining beds. This shows that the same general restoration approaches, in the same region, can produce different outcomes depending on whether the underlying water quality and thermal regime supported eelgrass. Numerous transplant projects in Chesapeake Bay over this same period failed to persist beyond one to two years (Orth et al. (2009), reinforcing the conclusion that active restoration in waters that have not recovered the conditions supporting natural revegetation should be treated as experimental rather than as a reliable management tool.

Criteria for successful SAV restoration

Active SAV restoration in North Carolina is most likely to succeed under the following circumstances. These are offered as decision criteria for evaluating proposed restoration projects; however, site-specific judgment by qualified practitioners and resource managers is essential.

1. Stressors have been mitigated or reduced enough for successful restoration. The causes of historical SAV loss at the site, whether they are degraded water clarity, nutrient enrichment, persistent physical disturbance (e.g., shellfish operations), or other stressors, have been reduced to the point where conditions fall within the target species' water quality conditions that support SAV growth. Where stressors persist, restoration should generally be deferred until conditions improve. However, smaller localized areas with adequate conditions may persist within the larger area in question.

2. Water quality conditions support SAV growth. Light availability, salinity, temperature, and dissolved-oxygen conditions at the proposed site are within the documented ranges for the target species and life stage to accommodate survival and growth.

3. Physical site conditions are appropriate. Sediment composition, depth, and current and wave energy are consistent with conditions at nearby reference beds and within the species' tolerance thresholds. Sites with persistent high energy disturbance or unsuitable sediments are unlikely to support persistent SAV regardless of planting effort.

4. Natural revegetation has not occurred despite suitable conditions. Measurements of adequate conditions for growth and evidence that a site has remained unvegetated over a period long enough to indicate that natural recolonization is constrained by seed or propagule limitation, dispersal limitation, or density-dependence rather than by a current stressor that planting cannot overcome.

DRAFT

5. Donor material and type can be sourced appropriately. Donor beds within a reasonable proximity to the restoration site are healthy and large enough to supply the needed material without compromising the donor population. Genetic and disease considerations should be addressed in donor selection (see below). The use of propagules (shoots) or seeds will need to be determined.

6. Climate-adapted species and genotype selection are considered. Where projected changes in temperature, salinity, or other conditions may push current SAV species or genotypes outside their tolerance ranges, restoration planning should consider whether the historically dominant species remains the most appropriate target, and whether donor genotypes from populations adapted to warmer or more variable conditions should be incorporated. Decisions about climate-adapted sourcing carry their own risks and should be made with input from genetic and ecological expertise.

7. Grazing pressure can be limited. Grazing and foraging from waterfowl, fish, and other wildlife (e.g., turtles, rays) can quickly cause disturbance and in some cases cause complete restoration failure, especially in small-scale experimental planting areas. Where this is a concern, there may be options such as temporary grazer exclosures (e.g., fencing) that could be placed around individual plants, groups, or the entire restoration site.

8. Project scale is commensurate with the goal. Project design includes sufficient planting effort (i.e., number of plants or seeds, spatial footprint, and density) to exceed plausible thresholds for establishment and to allow the planting to generate the self-reinforcing conditions (e.g., sediment stabilization, light improvement, energy attenuation) that support persistence. Small pilot plantings have value for testing site suitability and providing source material to an area but should not be expected to produce self-sustaining meadows on their own.

9. Monitoring duration is sufficient to evaluate persistence. A monitoring commitment of at least five years is in place, with the recognition that short-term (one- to two-year) survival is a weak predictor of long-term outcome. Many seagrass restoration projects globally have shown initial survival followed by failure within the first few years; therefore, persistence, not initial establishment, should be the success criterion.

10. Active restoration will not be impacted by herbicidal treatment for invasive species. Broad-scale usage of herbicidal treatments to exterminate an invasive species (e.g., hydrilla) can harm active restoration areas of native SAV. Planning and coordination with appropriate agencies should occur to minimize impacts (see Recommendation # 7).

11. Additional criteria as needed. For example, projects should be aligned with regional restoration priorities, presence of compatible adjacent habitats, and minimized conflicts

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with existing uses. These and other criteria as they arise will also be relevant for evaluating specific projects.

Current regulations pertaining to active SAV restoration

The regulatory framework governing active SAV restoration in North Carolina state waters is summarized below. In brief, the current framework allows for on-land culture and collection of SAV but provide limited mechanisms for in-water restoration efforts.

1. In-water leases for marine plants are not currently available. North Carolina General Statutes Chapter 113, Article 16, authorizes the Secretary to issue bottom and water-column leases for the cultivation of shellfish (N.C.G.S. §§ 113-202, 113-202.1, 113-202.2). The statutory authority is specific to shellfish and does not extend to marine plants. There is no analogous lease authority for SAV in current statute, and creating one would require legislative action. As a result, researchers and practitioners seeking to conduct active SAV restoration cannot obtain an in-water lease providing exclusive use, or a defined management footprint for the planted area.

2. Limited in-water protections for restored SAV sites. Once SAV has been re-established, it is generally afforded the same protections as naturally occurring SAV through existing rules governing impacts to SAV habitat. SAV is designated as Essential Fish Habitat (and as Habitat Area of Particular Concern in the South Atlantic) under the Magnuson-Stevens Act, triggering NOAA Fisheries consultation on federal actions that may adversely affect SAV. SAV is also protected through USACE Nationwide Permit conditions, and restrictions on shellfish lease siting in mapped SAV areas. The NCDMF Director may, by proclamation, designate a temporary research sanctuary that restrict fishing and equipment use for a SAV restoration project, renewable on an annual basis (15A NCAC 03I .0109). Beyond these mechanisms, NCDMF does not currently have a discrete tool for designating, managing, or providing long-term legal protection to a restoration site.

3. Land-based SAV culture. Collection, culture, and planting of SAV that involves land-based culture can be permitted under NCDMF's existing aquaculture authorities. Under 15A NCAC 03O .0503(a), it is unlawful to conduct aquaculture operations using marine and estuarine resources without an Aquaculture Operation Permit (AOP), and it is unlawful to take marine or estuarine resources from coastal fishing waters for aquaculture purposes without an Aquaculture Collection Permit (ACP). Both permits are issued by the NCDMF Fisheries Director and renewed annually. Holders of an ACP must submit an annual report stating the amount and disposition of resources collected, including any additional reporting required by other state or federal agencies. SAV falls within the scope of these

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authorities. N.C.G.S. § 113-129 defines "marine and estuarine resources" to include all uncultivated or undomesticated plant and animal life inhabiting or dependent upon coastal fishing waters, which encompasses SAV. The Marine Aquaculture Article (N.C.G.S. § 113-217) defines "marine aquatic species" to include aquatic plants found in coastal fishing waters. Through the conditions attached to AOPs and ACPs, NCDMF may regulate the amount of material collected, the location and timing of collection, and the methods used. These conditions are set on a permit-by-permit basis under the NCDMF Director's authority, providing flexibility but not a uniform standard for SAV.

4. Activities exempt from NCDMF permitting. Harvest and transplanting of SAV that does not involve land-based storage or culture is unlikely to trigger AOP or ACP requirements as currently written. For example, direct collection from a donor bed and immediate planting at a restoration site is exempt from permitting. The AOP requirement applies to "aquaculture operations," and the ACP requirement applies to take "for aquaculture purposes" (15A NCAC 03O .0503(a)(1) – (2)). Under the statutory definition, aquaculture involves the propagation and rearing of aquatic species in controlled or selected environments. Neither clearly applies to direct bed-to-bed transplantation.

5. Permitting requirements from other agencies. Individual SAV restoration projects may also involve other state and federal agencies, including the U.S. Army Corps of Engineers (USACE), the Division of Water Resources (DWR) for Section 401 Water Quality Certification, and the Division of Coastal Management (DCM) for Coastal Area Management Act (CAMA) major or minor permits and Dredge and Fill permits. Additional permitting requirements for transplanting SAV and protective structures are generally not anticipated to be burdensome, but consultation with agency staff through DEQ's Division of Environmental Assistance and Customer Service (DEACS) is highly recommended to confirm, as permitting requirements vary on a case-by-case basis.

Recommendations for policy and regulatory updates

The current regulatory landscape provides only partial coverage of active SAV restoration. Land-based operations can be permitted, but in-water collection and transplanting are largely unregulated, and there is no mechanism for in-water lease or for restoration-specific in-water protection. The recommendations below are offered for consideration during the 2026 CHPP amendment process.

Recommendation 1: Develop SAV considerations for AOP and ACP conditions. Authority to attach permit conditions to AOPs and ACPs already exists under 15A NCAC 03O .0502 and N.C.G.S. § 113-169.1 (also, N.C.G.S. § 113-134, N.C.G.S. § 113-169.1, N.C.G.S. § 113-182,

DRAFT

N.C.G.S. § 143B-289.52, and 15A NCAC 03O .0500). NCDMF could work with partners to develop a set of standard considerations for permit reviewers to ensure best practices when an AOP or ACP involves SAV. This could address allowable donor sources, take limits, seasonal restrictions on collection, disease and biosecurity screening, genetic considerations, and reporting requirements. Given that North Carolina is in the process of developing restoration best practices and evaluating long-term management needs, priority should be placed on conserving in-state donor material to support restoration and resilience of North Carolina's own SAV resource, and consideration should be given for limiting the collection of North Carolina SAV seeds or plants for restoration projects outside the state.

Recommendation 2: Address potential donor bed impacts. Harvest from a donor bed can be a source of impact in seagrass restoration van Katwijk et al. 2021. Even when transplant material is taken at modest intensities, the spatial and temporal patterns of harvest may affect donor bed density, structure, and recovery. NCDMF should consider requiring donor bed monitoring and reporting as a condition of permits authorizing SAV collection and should establish standardized criteria for evaluating donor bed suitability and post-harvest recovery. North Carolina donor bed monitoring protocols should be developed.

Recommendation 3: Address transplant sourcing. Transplant sourcing decisions affect the probability of restoration success and the broader management risks of the project. Four considerations are particularly relevant. First, disease and pathogen transmission risk increases with movement of plant material between water bodies where donor screening or quarantine in land-based culture may be appropriate. Second, there can be genetic differentiation among populations (Olsen et al. 2004). Locally sourced material is more likely to carry adaptations to local conditions, but genetically diverse populations may also be more resilient to environmental variability. For example, Campanella et al. (2010) documented genetic population structure along the U.S. Atlantic Coast and found that the Chesapeake Bay may be the best donor source for eelgrass for restoration. Third, sourcing should avoid moving material from areas where non-target species (including invasive species) may be inadvertently translocated and (or) have a mechanism for identifying non-target species prior to restoration activities. Fourth, physical proximity of donor to recipient site is among the more reliable predictors of restoration success (Van Katwijk et al. (2016)) and reduces handling time. Standard considerations attached to AOP/ACP conditions for SAV operations (Recommendation 1) should address each of these factors.

Recommendation 4: Address protection of restored SAV sites. As noted above, the only restoration-specific protection currently available is the temporary research sanctuary mechanism, which is time-limited and tied to a research purpose. Regulators may wish to

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consider a long-term protective designation. Because no current statute authorizes a marine plant lease, this would likely require either a statutory amendment extending lease authority to marine plants, or creation of a new designation under existing rule authority (e.g., extended-duration research areas or restoration-specific management zones).

Recommendation 5: Develop guidance for climate-adapted restoration decisions. North Carolina sits at a biogeographic transition where projected warming may affect species and genotype suitability for SAV restoration. NCDMF, in coordination with research partners (e.g., APNEP, NC Sea Grant, university research programs), should develop guidance on when and how to consider assisted migration or sourcing of climate-adapted genotypes as alternative restoration tools. Such guidance should address the trade-offs between local adaptation and projected conditions and should be developed in coordination with the AOP/ACP considerations identified in Recommendations 1 and 3.

Recommendation 6: Coordinate active restoration with aquatic weed control activities. Invasive species control under the Aquatic Weed Control Act of 1991 (N.C.G.S. § 113A-220 et seq.) is administered by NCDEQ with interagency advisory input through the North Carolina Aquatic Weed Control Council. Herbicide treatments (e.g., fluridone) intended for hydrilla in low-salinity systems can impact native SAV beds. NCDMF, which holds a seat on the Aquatic Weed Control Council (15A NCAC 01T .0107), should use that role to develop a coordination protocol with the Council and treatment agencies that identifies active native SAV restoration sites in advance of herbicide treatment planning to allow for buffer zones, treatment timing adjustments, or use of more selective methods where feasible. Also, where treatment is planned in waters that support native SAV, schedule treatment to allow harvest of native SAV material in advance of herbicide application for land-based culture under existing AOP/ACP authorities (Recommendation 1). This would allow for replanting into the treated area once herbicide residues have cleared and site conditions support re-establishment. Coordinated native restoration during herbicidal treatments requires planning across multiple seasons and species-specific consideration of holding feasibility, replanting timing, and post-treatment monitoring.

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Part 3: MFC Authority for Submerged Aquatic Vegetation Protections

Background

Impacts from physical disturbance remain a major consideration for the protection of high and low salinity SAV. Protections of SAV in North Carolina from physical disturbance include both state and federal policies that are wide-ranging, though room for improvement remains. The Albemarle-Pamlico National Estuary Partnership (APNEP) published a summary and assessment of the policies, permitting, and management of SAV in North Carolina (Ragain, in preparation). The report summarizes the various state and federal protections currently protecting SAV, ongoing threats to SAV conservation, and recommendations to address gaps in SAV policy and protection. The federal regulations covered are characterized by federal designations under the Magnusen-Stevens Act - SAV is designated as Essential Fish Habitat (EFH), and further as Habitat Areas of Particular Concern (HAPC) - which allow for federal protection. State regulations are characterized by state law and rules developed by the MFC, CRC, and EMC that aim to protect SAV by addressing specific impacts.

Recommendations made in the APNEP report fall into categories of regulatory, non-regulatory, and research suggestions. The regulatory recommendations include additional policy or rule recommendations addressing impacts from mariculture, development, boating, and water quality. The non-regulatory recommendations include outreach and education and further work from state agencies on mariculture, fisheries, development, and boating. The research suggestions cover directions for state agencies and university researchers to further explore impacts from water quality, fisheries, and boating, and to continue or expand monitoring. Among these, some specific examples of areas to improve included reducing the impacts on SAV from shellfish aquaculture operations, further research trawling impacts to SAV, and improving the compensatory mitigation for permitted SAV impacts.

MFC directive to develop additional SAV protections

Amendment 2 to the N.C. Shrimp Fishery Management Plan (FMP), adopted by the North Carolina Marine Fisheries Commission (MFC) in February 2022, was developed to further reduce bycatch of non-target species and minimize ecosystem impacts. The MFC's management strategy included adaptive management for future action to address issues related to SAV identified through North Carolina Division of Marine Fisheries (DMF) collaboration with the Coastal Habitat Protection Plan (CHPP) support staff, the Habitat

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and Water Quality (HWQ) Advisory Committee (AC), and stakeholder groups (NCDMF, 2022).

In February 2024, the DMF proposed additional SAV protections to the MFC in the Shrimp FMP Amendment 2 Revision. In response, the MFC passed a motion to refer the issue paper to the Northern and Southern Regional and Shellfish/Crustacean ACs for input. The response from shrimp fishery participants and the ACs to the MFC was against SAV-centered place-based management. While the ACs acknowledged the need to protect SAV, they cited that shrimp trawling was not the primary threat to SAV and further noted the need to address poor water quality as well as other bottom disturbing activities (e.g., propeller scarring, anchoring). The HWQ AC further recommended that a monitoring program be established to measure the status of SAV habitat in North Carolina (NCDMF, 2022). This led the DMF to recommend a broader approach to SAV protections. At its May 2024 business meeting, the MFC unanimously passed the following motion on the Shrimp FMP Amendment 2 Revision (emphasis added):

"to accept the Division of Marine Fisheries (DMF) recommendation that it is advantageous to examine issues and develop management actions related to the broader conservation of Submerged Aquatic Vegetation (SAV) habitat conservation. Therefore, action to address SAV protection under the Shrimp FMP Amendment 2 has concluded. The Marine Fisheries Commission (MFC) requests the DMF work with the MFC's Habitat and Water Quality Advisory Committee to examine and develop more comprehensive options to protect identified SAV habitat related to all activities under the authority of the MFC, consistent with the N.C. Coastal Habitat Protection Plan."

Following this action, DMF and partners have evaluated the MFC's authority for physical protections, historical management actions, and the basis for further actions to strengthen protections from physical impacts to SAV. This evaluation was undertaken in the context of the Shrimp FMP and Bay Scallop FMP, as well as other aspects of marine and estuarine fisheries resources that are under the MFC's authority.

Evaluation of MFC authority for physical protections

MFC statutory authority

This evaluation began with a broad review of the statutory authority of the MFC. N.C.G.S. § 113-132, gives the MFC authority over the conservation and regulation of marine and estuarine resources.

Marine and estuarine resources are defined by N.C.G.S. § 113-129 (11) as:

DRAFT

"All fish, except inland game fish, found in the Atlantic Ocean and in coastal fishing waters; all fisheries based upon such fish; all uncultivated or undomesticated plant and animal life, other than wildlife resources, inhabiting or dependent upon coastal fishing waters; and the entire ecology supporting such fish, fisheries, and plant and animal life."

The inclusion of the phrase "entire ecology" in this statute provides an expansive basis of authority over all organisms and the environment supporting the plant and animal life in the State waters of the Atlantic Ocean and coastal fishing waters.

The MFC's authority over marine and estuarine resources is subject to specific grants of authority to other state agencies, which are summarized below. Even accounting for those exceptions, the MFC retains broad jurisdiction over the conservation and regulation of marine and estuarine resources, including the entire ecology of coastal fishing waters. For areas outside its jurisdiction, the MFC is able to coordinate and collaborate with the respective commissions and agencies on reducing impacts to marine and estuarine resources.

Regarding the MFC's jurisdiction, there are three primary laws that delegate authority to the MFC to implement its powers and duties. First, N.C.G.S. § 113-134 grants explicit rulemaking authority to the MFC. The implementation of this authority includes adopting rules to define and designate specific areas that are subject to certain restrictions for the protection of resources that in some instances are referenced in other Commissions' rules.

Second, in addition to the broad authority over marine and estuarine resources, N.C.G.S. § 113-182 authorizes the MFC to regulate marine and estuarine fishing and fisheries related to these resources. This includes the power to authorize, license, regulate, prohibit, prescribe, or restrict all forms of marine and estuarine resources with respect to gear and activities.

Finally, the MFC has the power and duty to establish standards and adopt rules for the management, protection, preservation, and enhancement of marine and estuarine resources within its jurisdiction, per N.C.G.S. § 143B-289.52. This statute further elaborates on these duties and powers through: specific powers and rulemaking authority regarding commercial and recreational fisheries and mariculture in subsection (a); rulemaking authority for specific sections and statues of Chapter 113 in subsection (b); and management and potential restriction of fish take, equipment and vessel usage, and possession and movement of marine and estuarine resources as needed to carry out its duties in subsection (c). The remainder of the statute sets requirements for the MFC's administrative powers and duties pertaining to the powers and duties of subsections (a), (b), and (c).

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As mentioned above, the MFC's authority over marine and estuarine resources is subject to specific grants of authority to other state agencies, including the Department of Agriculture and Consumer Services, the Pesticide Board, the Commission of Public Health, the Environmental Management Commission (EMC), other DEQ divisions regulating air or water, and the Coastal Resources Commission. The MFC's authority is also subject to the concurrent jurisdiction of the Wildlife Resources Commission (WRC) for instances of overlap between the MFC and the WRC. The delineation of the respective authorities of these agencies highlights not only the distinct ways that each agency can affect coastal habitat, but also the need for agencies to collaborate to develop holistic solutions.

The jurisdiction of the Department of Agriculture and Consumer Services is defined in N.C.G.S. 143A Article 7 and the authorities outlined in N.C.G.S. Chapter 106. The authorities in these statutes, as it pertains to coastal habitat impacts, includes regulatory authority over agricultural runoff, insecticides, forestry, and other impacts. As a result, the MFC authority does not include regulating impacts from or connected to agriculture or forestry but could, knowing the boundaries, coordinate with the Department of Agriculture and Consumer Services on overlapping issues.

The jurisdiction of the Pesticide Board is defined in N.C.G.S. 143 Article 52. Within this Article, N.C.G.S. § 143-437 grants the Pesticide Board the powers and duties to "carry out a program of planning, environmental and biological monitoring, and of investigation into long-range needs and problems concerning pesticides." The authority prescribed in these statutes means that the MFC cannot regulate or directly monitor impacts on marine and estuarine resources from pesticides but could coordinate ongoing DMF monitoring with monitoring from the Pesticide Board to enable concurrent evaluation and future regulatory coordination.

The authority of the Commission for Public Health is defined in N.C.G.S. § 130A-29. This statute grants express rulemaking authority to implement public health programs related to sewage, sanitation, and biological agents, among others. These instances of effects are, therefore, outside of the authority of the MFC, though, impacts within the existing regulations of the Commission of Public Health are potentially less likely to impact marine and estuarine resources without also impacting public health.

The authority of the EMC is defined in N.C.G.S. 143 Article 21. Among the duties outlined in this Article, the EMC has authority over administering the federally mandated National Pollutant Discharge Elimination System (NPDES) permit and certifications pursuant to section 401 of the Clean Water Act, 33 U.S.C. § 1341(a)(1), and impacts from non-discharge related effects, animal feeding operations, and impacts to air quality. While these impacts are, as a result, not under the authority of the MFC, the CHPP

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implementation by the EMC can still address them. This delineation of authority also encompasses the other listed DEQ Divisions, namely, DWR and the Division of Air Quality (DAQ).

Lastly, among this list is the Coastal Resources Commission (CRC), whose authority is defined in N.C.G.S. 113A Article 7, or the Coastal Area Management Act (CAMA). This Article gives the CRC and DCM authority over development impacts to coastal wetlands and waters. As a result, the MFC has no direct authority over impacts from coastal development, though, the CRC's rules rely on the MFC's definitions of certain marine and estuarine resources and protected areas (e.g., SAV, nursery areas, anadromous fish spawning areas). DMF also reviews potential impacts from CAMA permit applications utilizing the applicable CRC and MFC rules to determine and address impacts on marine and estuarine resources. Additionally, the CHPP implementation by the CRC can also address coastal development impacts.

Supporting statutory authority

The statutory authority outlined above is further supported by additional general statutes that provide clarification of the delineation of authority and provide management tools for the MFC to fulfill its powers and duties.

N.C.G.S. § 113-134.1 clarifies the geographic extent of the MFC's authority by directing the MFC to exercise its regulatory authority over marine and estuarine resources in the Atlantic Ocean to the extent of state jurisdiction of ocean waters (three nautical miles). This statute also grants enforcement authority of these regulations to marine fisheries inspectors in these waters.

A vital tool of the MFC to be able to responsibly manage marine and estuarine resources is proclamation authority, authorized by N.C.G.S. § 113-221.1. This statute enables the MFC to delegate authority to the Fisheries Director to issue proclamations that suspend or implement rules (in whole or in part) of the MFC that may be affected by variable conditions. Of the three commissions charged with reviewing and revising CHPPs, only the MFC has proclamation authority. The MFC's delegation of proclamation authority to the Fisheries Director through adoption of a rule (e.g., 15A NCAC 03K .0201), is described in more detail in the MFC Rules and Historical Management Actions and Basis for Additional Action sections below.

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CHPP and FMP statutory authority

The MFC has two statutorily authorized tools that are required to address marine and estuarine resource and habitat management issues: FMPs and CHPPs.

N.C.G.S. § 113-182.1 sets the requirements for management of commercially or recreationally significant species or fisheries that comprise state marine or estuarine resources through FMPs. Each FMP shall contain, among other items, "fishery habitat and water quality considerations consistent with Coastal Habitat Protection Plans" that have been adopted. Additionally, this statute states in subsection (f) that the MFC "shall adopt rules to implement Fishery Management Plans."

The requirements for management of critical fisheries habitats through CHPPs is set forth in N.C.G.S. § 143B 279.8, which states that the CHPPs shall "describe and classify biological systems in the habitats" among other requirements. The 2005 CHPP (Street et al., 2005) further classified the state's coastal waters into six basic fish habitat types: water column, shell bottom, SAV, soft bottom, hard bottom, and wetlands. This statute also sets forth in subsection (c) that the MFC "shall adopt rules to implement Coastal Habitat Protection Plans." The MFC has adopted numerous rules to implement North Carolina's 13 FMPs since the FRA was enacted in 1997 but has not yet exercised its authority to adopt rules to implement the CHPP.

MFC rules for habitats

The MFC has several rules in place to protect habitat, but they have been promulgated from the primary perspective of protection of FMP-covered species, such as shrimp, bay scallops, or juvenile finfish, for example. In other words, the currency used to date has not been "habitat," but the MFC has the authority to do so as explained in the first part of this examination.

The first instance of habitat-related MFC rules, is 15A NCAC Subchapter 03I, Rule .0101, which defines important fish habitat areas, including primary and secondary nursery areas, strategic habitat areas, and SAV habitat. Not only do these definitions play a role in the MFC's rules and management through FMPs, they also are referenced in the EMC and CRC rules. These definitions, therefore, are pivotal to the protection of these habitat types from fisheries, water quality, and coastal development impacts.

Subchapter 03K contains three instances of gear restrictions designed to protect SAV. These rules prohibit the use of certain rakes for clamming in established SAV beds or in areas of *Spartina alterniflora* (15A NCAC 03K .0102(2)); the use of mechanical methods for oystering or clamming in established SAV beds or in areas of *Spartina alterniflora* (03K

DRAFT

.0108(b)(1)); and the taking of clams by hand tongs in established SAV beds or in areas of *Spartina alterniflora* (03K .0304(a)).

Subchapter 03N establishes and provides protections for nursery areas and anadromous fish spawning areas. Rule 03N .0103 clarifies the specific bounds of a particular nursery area in relation to specific coordinates, inland-coastal boundary lines, or headwaters of the named waterbody. Rule 03N .0104 then provides protection for primary nursery areas through prohibition of the use of trawl nets, long haul seines, swipe nets, dredges, or mechanical methods used to take clams or oysters. Rule 03N .0105 provides protections for permanent and special secondary nursery areas through prohibition of trawls nets, and it allows for the fisheries director to open special secondary nursery areas to shrimp and crab trawling with certain restrictions by proclamation. Primary nursery areas as defined and designated in MFC rules, along with definitions of SAV and shellfish producing habitat, are also cited in CRC[1] and EMC[2] rules for further protections within the respective Commissions' jurisdictions. The protections found in these Commissions' rules include protections for these MFC defined resources from specific activities and through elevating surface water classifications to further protected levels, respectively.

Subchapter 03R designates the geographic locations of primary nursery areas (.0103), permanent secondary nursery areas (.0104), special secondary nursery areas (.0105), and anadromous fish spawning areas (.0115), among other areas of gear-based management. The designation, through MFC rule, of these areas began with primary nursery areas in 1977, continued with permanent and special secondary nursery areas in 1986, and finally with anadromous fish spawning areas in 2007, with a handful of amendments in the last 20 years.

Although not in and of itself a protection of habitat, the MFC's delegation of proclamation authority creates a useful tool for habitat protection and management. 15A NCAC 03H .0103 sets forth the scope of the Fisheries Director's to implement management through proclamations. It outlines the variable conditions through which the Fisheries Director can issue a proclamation if a specific variable condition is not set forth in a rule of the MFC delegating proclamation authority. This rule also makes it unlawful to violate a proclamation, which creates an important tool for enforcement.

[1] References to MFC definitions and designations of primary nursery areas and the MFC definition of SAV within CRC Rules can be noted in 15A NCAC 07H .0208, .0209, and .1505.

[2] References to MFC definitions SAV and shellfish producing habitat within EMC Rules can be noted in the surface water classification of outstanding resource waters (ORW) in 15A NCAC 02B .0225 that provide set protections from activities within the EMC's jurisdiction based on the classification.

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Historical management actions and basis for additional action

The MFC's management of impacts to the CHPP-defined habitats has occurred through species- or gear-based management actions taken through species-specific FMPs or the defined fish habitat areas, outlined above, in subchapters 03N and 03R. However, the MFC has authority to proceed with adopting rules for habitat-based management actions consistent with the CHPP.

Management actions, which can include habitat protection and habitat management, are implemented through permanent rulemaking, which can include the use of proclamations. Permanent rulemaking follows the formal process set forth in the Administrative Procedure Act, N.C.G.S. Chapter 150B. It may take up to two to three years if legislative review is required to complete this process for a rule to go into effect. In contrast, the use of proclamations allows for more responsive management, given that the variable conditions and specific restrictions have previously been set in rule through the formal rulemaking process and must be met prior to issuance. However, this requirement means that as part of the delegation of MFC rulemaking authority to the Fisheries Director, the MFC must first undergo permanent rulemaking for a specific static rule to prescribe the applicable restrictions for which the proclamation authority can be used.

Recent developments have highlighted the difficulty in achieving comprehensive protections for habitats in the MFC's implementation of protections and restrictions for habitat management. One such development is an increasing interest in SAV restoration projects across the east coast. While there is not currently a method by which public trust waters can be leased for the growout and harvest of SAV, SAV seeds can be harvested with proper permitting and replanted in restoration project areas. The success rate of such replanting is not yet well understood in North Carolina; however, the potential development of viable replanting methods could lead to much greater management needs to regulate SAV seed harvest. The existing permit does not limit the amount, season, or methodology used to harvest SAV. Unchecked, an increase in SAV harvest combined with seasonal variation among SAV beds and unknown long-term impacts from harvest activities (e.g., water quality and physical destruction), could further exacerbate SAV loss in key historical SAV areas. Additionally, outside of the currency the MFC has historically used for management—gear- and species-driven rule restrictions and protections—outlined above, the MFC has no existing rules to broadly address protections for SAV or other habitats at large that are under its authority. An additional habitat currency would enable SAV management that could benefit all estuarine fisheries in NC outside of the individual species FMP process.

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Another example comes from the designation of Deep-Water Oyster Recovery Areas (DORAs) in the Eastern Oyster FMP Amendment 5, adopted by the MFC in 2025 (NCDMF, 2025). As a management strategy, designation of DORAs recognized the habitat value of deep-water oyster reefs. Mechanical oyster dredging in DORAs is prohibited, as these natural reefs are particularly susceptible to mortality from water quality impacts. The Director has proclamation authority as set forth in 15A NCAC 03K .0201(b); however, the management options apply only to the taking of oysters. This does not prevent impacts from other bottom disturbing gears (fishing and non-fishing) that can contribute to the degradation of these reefs. This concern is especially prevalent for reefs that may be identified to have little to no living oyster presence but still have a shell matrix capable of recovery. Further protections of these vacant shell bottom reefs could encourage recovery with no expense to the oyster fishery. Additionally, a habitat-based management approach could allow for coordinated FMP and non-FMP management to benefit the oyster stock from multiple avenues.

Need for habitat-based rulemaking

This analysis of MFC authority, as it pertains to direct SAV protections outside of species-specific FMPs or defined fish habitat areas, has highlighted the applicability and need to develop a rule framework to enable habitat-based management of all habitat types under the MFC's jurisdiction. Rulemaking specific to these habitats would be consistent with the statutorily defined authority of and existing rules adopted by the MFC.

Additionally, developing rules specific to these habitats would enable the MFC to address direct impacts to each type and provide management solutions for needs outside of or broader than an individual FMP. As expressed above in the SAV considerations in the Shrimp and Bay Scallop FMPs and the shell bottom considerations in the Eastern Oyster FMP, management specific to each habitat type could address impacts beyond the restrictions currently provided in each species-based rule (15A NCAC 03L .0101, 03K .0501, and 03K .0201, respectively).

Conclusion

The authority of the MFC within the context of the CHPP, as outlined above, is sufficiently broad to encompass regulating individual impacts to marine and estuarine resources, aside from the jurisdictional boundaries with other agencies and commissions. The definition of marine and estuarine resources also confirms that the MFC's authority encompasses both biotic and abiotic factors that the habitat types fall under. This authority

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given over the "conservation and regulation of marine and estuarine resources," per N.C.G.S. § 113-132(a), along with the requirement of each CHPP to "recommend actions to protect and restore the habitats," per N.C.G.S. § 143B-279.8(a)(4), implies the statutory responsibility of the MFC to act to protect and conserve the CHPP-defined habitats.

As a result of this analysis, this CHPP amendment recommends the initiation of the formal MFC rulemaking process to develop a CHPP habitat-based rule framework following the adoption of the CHPP amendment. This rulemaking process, consistent with the Administrative Procedure Act, would include significant coordination between and input from the MFC, DMF, regulated stakeholders, and the general public.

Recommended Action

DMF will initiate formal rulemaking to develop a CHPP habitat-based rule framework through development of a rulemaking issue paper beginning in 2027. This issue paper will address the need for rules specific to each habitat type, including consideration of regulatory needs for SAV harvest and transplanting for restoration projects, considerations regarding gear and activity impacts in DORAs, and parameters for establishing criteria for habitat-based management. The public, stakeholder, and advisory committee comments related to the rulemaking issue paper will be brought to the Habitat and Water Quality Advisory Committee to evaluate and develop proposed management options for the rule frameworks regarding SAV and the other habitats within the MFC's jurisdiction.

References

NCDMF. 2022. North Carolina Shrimp Fishery Management Plan, Amendment 2. North Carolina Division of Marine Fisheries, Morehead City, North Carolina. 323 p.

NCDMF. 2025. North Carolina Oyster Fishery Management Plan, Amendment 5. North Carolina Division of Marine Fisheries, Morehead City, North Carolina. 139 p.

Ragain, R. In preparation. Submerged Aquatic Vegetation: A Comprehensive Assessment of Policy, Permitting, and Management in North Carolina. Albemarle-Pamlico National Estuary Partnership.

Street, M. W., A. S. Deaton, W. Chappell, and P. D. Mooreside. 2005. North Carolina Habitat Protection Plan. Page 656. North Carolina Department of Environment and Natural Resources, Division of Marine Fisheries.

DRAFT

NC Marine Fisheries Commission

Rulemaking

November 2026 Quarterly Business Meeting

Documents

Rulemaking Update Memo

2026-2027 Annual Rulemaking Cycle

News Release for Notice of Text

N.C. Register Excerpt

Fiscal Analysis

Written Comments

Public Hearing Summary

JOSH STEIN
Governor

D. REID WILSON
Secretary

JONATHAN HOWELL
Director

October 28, 2026

MEMORANDUM

TO: N.C. Marine Fisheries Commission

FROM: Catherine Blum, Rulemaking Coordinator
Marine Fisheries Commission Office

SUBJECT: N.C. Marine Fisheries Commission Rulemaking

Issue

Request the N.C. Marine Fisheries Commission (MFC) vote on final approval to adopt the single rule in the 2026-2027 rule package at its November 2026 business meeting.

Findings

- At its May 2026 business meeting, the MFC began the process for one rule for the management of Atlantic bonito.
- On August 3, 2026, the rule was published in the *N.C. Register*, beginning the public comment process; a news release was issued.
- A public hearing was held on August 26, 2026, at 6 p.m. via WebEx with a listening station in Morehead City.
- The public comment period closed October 2, 2026.
- The public comments will be presented to the MFC at its November 2026 business meeting to inform its scheduled vote on final approval to adopt the Atlantic bonito management rule. The majority of stakeholders supported the proposed rule.
- If approved, the rule is subject to legislative review; the earliest possible effective date would be in spring 2027.
- Only the proposed five-fish recreational bag limit per person per day would be implemented upon the effective date of the rule. Additional steps would need to be taken for any other harvest restrictions to be implemented, as outlined in this memo.

Action Needed

The MFC will be asked to vote on final approval to adopt the proposed Atlantic bonito rule.

2026-2027 Rulemaking Cycle (1 rule)
ATLANTIC BONITO MANAGEMENT (15A NCAC 03M .0524)

Public Comments

The public comment period for Notice of Text for Rulemaking for the MFC's proposed Atlantic Bonito rule opened on August 3, 2026, and closed at 5 p.m. on October 2, 2026. In total, 86 public comments were submitted: 78 in support, 7 against, and 1 undecided. Of these, eight individuals submitted either two or three public comments via a combination of online submittals and at the August 26 public hearing. These eight individuals represent 18 public comments in support of the proposed rule, yielding a total of 68 unique individuals in support, 7 against, and 1 undecided. A table of the public comments received is included in the rulemaking section of the briefing materials. The table of public comments is organized alphabetically by the commenter's full name [first name / last name]. Doing so puts in sequence multiple comments from the same individual.

There were 12 speakers at the August 26 public hearing, one of which participated in person via the listening station at the N.C. Division of Marine Fisheries (DMF) Central District Office in Morehead City. These 12 individuals are included in the counts above. Of these, 11 speakers were in support of the proposed rule and 1 was against. A summary of the public hearing is included in the rulemaking section of the briefing materials, including the detailed comments provided by each participant.

Because there were several participants who opted to submit multiple comments, the hearing participants are included in the table of the public comments, which were largely received online. The table also accounts for two individuals who submitted online comments about the proposed rule as part of the August 2026 MFC business meeting, which occurred during the open comment period. These two individuals are also included in the counts above. A separate copy of their comments is also included in the rulemaking section of the briefing materials.

History of Proposed Rule

At its May 2024 business meeting, the MFC passed a motion to request DMF staff develop an issue paper for Atlantic bonito management, including landings information and proposed rule language, using the previous sheepshead issue paper (February 11, 2013) as a model to follow. Discussions among commissioners noted concerns expressed by recreational stakeholders about angler behavior changing in targeting Atlantic bonito in more recent years and the potential need to implement a recreational bag limit. Further concerns expressed by the MFC identified limited information about Atlantic bonito in this part of the Atlantic Ocean and no measure of stock status for the population, and whether these recent increases in recreational catches may not be due to more fish, but rather due to changes in fishing tactics and new technologies available to recreational anglers to improve their success in catching Atlantic bonito when available in state waters. Commissioners did not express concern for commercial catches due to a limited shelf life as a fresh product and not being desirable frozen as likely reasons behind no similar increase in commercial harvest occurring. Potential waste of the resource was discussed, since there are no current limits on Atlantic bonito. The MFC also identified the need to learn more about the fisheries and develop a rule to implement regulations to get ahead of a potential problem.

Commissioners continued discussions on Atlantic bonito at the August and November 2024, and May 2025 MFC business meetings with an urgency to be proactive in their management and continued to stress the need to implement a bag limit in the recreational fishery. After key DMF vacancies were filled, DMF staff presented background information about the life history and catch characteristics of Atlantic bonito to the MFC at its August 2025 business meeting. Commissioners discussed that Atlantic bonito appear to behave differently off southeast North Carolina than in other locations along the coast, showing preference for structure and pondered if these preferences are associated with spawning, thereby making Atlantic bonito more vulnerable to harvest. Commissioners mentioned that the presentation illustrated the increasing trends in recreational landings with smaller fish being caught in recent years and discussed the potential for implementing both a bag limit and possibly a size limit on the recreational sector. The MFC passed a motion to ask the DMF staff to bring proposed rulemaking language for a five-fish recreational bag limit per person (per day) for Atlantic bonito to its November 2025 business meeting, a request DMF staff fulfilled.

The DMF developed an issue paper for the management of Atlantic bonito[1] containing background information, authority for management, and discussion of potential management options, including proposed rule options. The issue paper was presented to the MFC at its February 2026 business meeting when it selected Option 4 as its preferred management option for Atlantic bonito. Upon the effective date of the proposed rule, this option would implement a five-fish recreational bag limit per person per day and delegate authority to the Fisheries Director to implement additional harvest restrictions by proclamation; however, additional steps would need to be taken before issuance of a proclamation. Any harvest restrictions beyond the five-fish recreational bag limit would undergo a process including the DMF presenting the most recent data to the MFC, MFC consent that harvest restrictions are needed based on the data, outreach and education to the regulated public that management will change, and identification of an appropriate effective date for the proclamation that would be issued to implement the restrictions so the regulated public can prepare.

Following the February 2026 MFC business meeting, DMF staff developed a fiscal analysis of the proposed rule[2] that was approved by the Office of State Budget and Management. At its May 2026 business meeting, the MFC approved Notice of Text for Rulemaking to begin the process as part of its 2026-2027 annual rulemaking cycle. A copy of the fiscal analysis and a table showing the timing of the steps in the process are included in the rulemaking section of the briefing materials.

On August 3, 2026, the proposed rule was published in the *N.C. Register*, beginning the public comment process; a news release was issued. These materials are also in the rulemaking section of the briefing materials. A public hearing was held on August 26, 2026, at 6 p.m. via WebEx with a listening station in Morehead City. The public comment period closed October 2, 2026. Comments received (summarized in the "Public Comments" section above) will be presented to the MFC at its November 2026 business meeting when it is scheduled to vote on final approval of the rule. The proposed rule is subject to legislative review per Session Law 2019-198 and

[1] https://www.deq.nc.gov/marine-fisheries/marine-fisheries-commission/february-2026/atlantic-bonito-issue-paper/open
[2] https://www.deq.nc.gov/deq2026-04-30-updated-bonito-approved-notepdf/open

N.C.G.S. § 14-4.1 and could possibly be effective following the legislative review process in the 2027 long session; however, the timing is such that the legislative review process may not occur until the 2028 short session. The earliest possible effective date of the rule would be in spring 2027.

Periodic Review and Expiration of Existing Rules (335 rules)

North Carolina N.C.G.S. § 150B-21.3A, enacted in 2013, requires state agencies to review existing rules every 10 years in accordance with a prescribed process that includes a report phase, followed by rule readoption. To comply with the periodic review schedule adopted by the Rules Review Commission (RRC) for the second iteration of the requirements, the MFC gave approval at its February 2026 business meeting of the initial agency determination of each of its rules as "necessary" to proceed to public notice for four groups of rules, per N.C.G.S. § 150B-21.3A:

- 15A NCAC 03Q .0100 (9 rules);
- ALL OTHER 15A NCAC 03 RULES (194 rules);
- 15A NCAC 10C .0100 (11 rules); and
- 15A NCAC 18A .0100, .0300-.0900, .3400 (132 rules).

The public comment period for the reports on these four groups of rules was from March 2, 2026, through May 1, 2026. All the rules are in Title 15A, which is the Department of Environmental Quality. The nine MFC rules in 15A NCAC 03Q .0100 are jointly adopted with the Wildlife Resources Commission (WRC). The 11 WRC rules in 15A NCAC 10C .0100 are jointly adopted with the MFC. All 20 jointly adopted rules set requirements for joint fishing waters. Rules in Chapter 03 are for the management of marine fisheries, while rules in Subchapter 18A are for the management of shellfish sanitation and recreational water quality.

Following the conclusion of the public comment period, the MFC was required to review any public comments and prepare a brief response addressing the merits of each comment. No public comments were received so the proposed final determinations are unchanged: each rule remains classified as "necessary". This information became the final report and was approved by the MFC at its August 2026 business meeting. A copy of the four reports is available on the DMF webpage for the August 2026 MFC business meeting.

Following the August 2026 MFC business meeting, the final reports were submitted to the RRC, which, if approved, will be forwarded to the Joint Legislative Administrative Procedure Oversight Committee for final determination. The MFC's reports are due to the RRC for its January (15A NCAC 03Q .0100; all other 03 rules; 10C .0100) and March (15A NCAC 18A .0100, .0300-.0900, .3400) 2027 meetings.

The second part of the process is the re-adoption of rules. The final report determines the process for re-adoption. A necessary rule must be readopted as if it was a new rule. An unnecessary rule will expire at the end of the report process and be removed from the N.C. Administrative Code. The RRC works with each agency to consider the agency's rulemaking priorities in establishing a deadline for the re-adoption of rules. This consultation process is expected to occur in the

spring or summer of 2027. It is anticipated that the MFC will need to readopt all 335 of its rules that are subject to the Periodic Review requirements as if they are new rules. Rules can be amended during readoption and fiscal analysis of the rules will still be required. Based on the MFC's rulemaking priorities and the number of rules, the readoption process is expected to take several years to complete.

N.C. Marine Fisheries Commission
2026-2027 Annual Rulemaking Cycle

November 2026

Time of Year	Action
February-April 2026	Fiscal analysis of rule prepared by DMF staff and approved by Office of State Budget and Management
May 14, 2026	MFC votes to approve Notice of Text for Rulemaking
August 3, 2026	Publication of proposed rule in the *North Carolina Register*
August 3 - October 2, 2026	Public comment period held
August 26, 2026, 6 p.m.	Public hearing held via WebEx with listening station at NCDEQ Division of Marine Fisheries Central District Office at 5285 Highway 70 West, Morehead City
November 17-18, 2026	**MFC receives public comments and votes on final approval of permanent rule**
December 2026 or January 2027	Rule reviewed by Office of Administrative Hearings/ Rules Review Commission
2027 or 2028 legislative session	Possible effective date of rule subject to legislative review per S.L. 2019-198 and G.S. 14-4.1
2027 or 2028 legislative session	Rulebook supplement available online pending legislative review process

July 31, 2026

Comment period opens, public hearing scheduled for one marine fisheries rule

MOREHEAD CITY –The N.C. Marine Fisheries Commission (MFC) will begin accepting public comment on Monday, Aug. 3, for a proposed rule that would set a five-fish recreational bag limit for Atlantic bonito.

The rule would also authorize the Director of the NC Department of Environmental Quality's Division of Marine Fisheries (DMF) to implement additional management measures by proclamation with prior consent of the MFC.

The public may comment on the proposed rule at a public hearing or in writing.

Public Hearing
A public hearing will be held by WebEx on Aug. 26, 2026, at 6 p.m. A listening location will be established at the Division of Marine Fisheries' Central District Office.

The public may join the meeting online. Those who wish to comment during the hearing must register to speak by noon on the day of the hearing. Those who wish to speak at the listening location may sign up when they arrive.

WHO:	Marine Fisheries Commission
WHAT:	Public Hearing for Proposed Rules
WHEN:	Aug. 26, 2026, at 6 p.m.
WHERE:	Meeting by Web Conference Click Here for Links
LISTENING LOCATION:	NC Division of Marine Fisheries Central District Office 5285 Highway 70 West Morehead City, NC 28557

Written Comments
Members of the public may also submit written comments through an online form or through the mail to:

N.C. Marine Fisheries Commission Rules Comments
P.O. Box 769
Morehead City, N.C. 28557

Comments must be posted online or received by DMF by 5 p.m. Oct. 2, 2026.

Links to the public hearing registration form and online comment form, as well as text of the proposed rule and links to join the meeting, can be found on the N.C. Marine Fisheries Commission's 2026-2027 Proposed Rules Webpage.

The proposed rule will be presented to the MFC for final approval in November 2026. If approved, the earliest effective date of the rule would be in 2027 pending legislative review.

For questions about the MFC rulemaking process, email Catherine Blum, rules coordinator for the DMF.

For More Information
Contact: Patricia Smith
Phone: 252-515-5500

NORTH CAROLINA REGISTER

VOLUME 41 • ISSUE 03 • Pages 245 – 332

August 3, 2026

I. EXECUTIVE ORDERS
Executive Order No. 39 ..... 245 – 247

II. IN ADDITION
North Carolina License and Theft Bureau – Public Notice ..... 248 – 249

III. PROPOSED RULES
Public Safety, Department of
Alcoholic Beverage Control Commission ..... 250 - 251
Private Protective Services Board ..... 251 - 252
Environmental Quality, Department of
Marine Fisheries ..... 252 – 253
Occupational Licensing Boards and Commissions
Barber and Electrolysis Examiners, Board of ..... 253 – 254
Locksmith Licensing Board ..... 254 – 255

IV. APPROVED RULES ..... 256 – 297
Council of State, Department of
Council of State
Justice, Department of
Criminal Justice Education and Training Standards Commission
Environmental Quality, Department of
Coastal Resources Commission
Education, State Board of
Education, State Board of
Occupational Licensing Boards and Commissions
Clinical Mental Health Counselors, Board of Licensed
Appraisal Board

V. RULES REVIEW COMMISSION ..... 298 – 332

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Julie B. Eddins, Publications Coordinator
Serena Samuels, Publications Assistant

Contact List for Rulemaking Questions or Concerns

For questions or concerns regarding the Administrative Procedure Act or any of its components, consult with the agencies below. The bolded headings are typical issues which the given agency can address but are not inclusive.

Rule Notices, Filings, Register, Deadlines, Copies of Proposed Rules, etc.

Office of Administrative Hearings
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1711 New Hope Church Road — 984-236-1850
Raleigh, North Carolina 27609 — 984-236-1947 FAX

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Rule Review and Legal Issues

Rules Review Commission
1711 New Hope Church Road — 984-236-1850
Raleigh, North Carolina 27609 — 984-236-1947 FAX

contact:	Seth M. Ascher, Commission Counsel	seth.ascher@oah.nc.gov	984-236-1934
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	Christopher S. Miller, Commission Counsel	christopher.miller@oah.nc.gov	984-236-1935
	Alexander Burgos, Paralegal	alexander.burgos@oah.nc.gov	984-236-1940

Fiscal Notes & Economic Analysis

Office of State Budget and Management
116 West Jones Street
Raleigh, North Carolina 27603-8005
Contact: Julie Ventaloro, Economic Analyst — osbmruleanalysis@osbm.nc.gov — 984-236-0694

Fiscal Research Division
Legislative Office Building
300 N. Salisbury Street, Suites 619 and 400
Raleigh, NC 27603-5925
Contact: Brian Matteson — brian.matteson@ncleg.gov — 919-733-4910

NC Association of County Commissioners — 919-715-2893
215 North Dawson Street
Raleigh, North Carolina 27603
contact: Amy Bason — amy.bason@ncacc.org

NC League of Municipalities — 919-715-2925
424 Fayetteville Street, Suite 1900
Raleigh, North Carolina 27601
contact: Baxter Wells — bwells@nclm.org

Legislative Process Concerning Rulemaking

545 Legislative Office Building
300 North Salisbury Street — 919-733-2578
Raleigh, North Carolina 27611 — 919-715-5460 FAX

Jason Moran-Bates, Staff Attorney
Chris Saunders, Staff Attorney
Aaron McGlothlin, Staff Attorney

NORTH CAROLINA REGISTER

Publication Schedule for January 2026 – December 2026

FILING DEADLINES			NOTICE OF TEXT		PERMANENT RULE			TEMPORARY RULES
Volume & issue number	Issue date	Last day for filing	Earliest date for public hearing	End of required comment Period/Latest date for public hearing	Deadline to submit to RRC for review at next meeting	RRC Meeting Date	Earliest Eff. Date of Permanent Rule	270th day from publication in the Register
40:13	01/02/26	12/11/25	01/17/26	03/03/26	03/20/26	04/28/2026	05/01/26	09/29/26
40:14	01/15/26	12/23/25	01/30/26	03/16/26	03/20/26	04/28/2026	05/01/26	10/12/26
40:15	02/02/26	01/09/26	02/17/26	04/06/26	04/20/26	05/28/2026	06/01/26	10/30/26
40:16	02/16/26	01/26/26	03/03/26	04/17/26	04/20/26	05/28/2026	06/01/26	11/13/26
40:17	03/02/26	02/09/26	03/17/26	05/01/26	05/20/26	06/25/2026	07/01/26	11/27/26
40:18	03/16/26	02/23/26	03/31/26	05/15/26	05/20/26	06/25/2026	07/01/26	12/11/26
40:19	04/01/26	03/11/26	04/16/26	06/01/26	06/20/26	07/30/2026	08/01/26	12/27/26
40:20	04/15/26	03/24/26	04/30/26	06/15/26	06/20/26	07/30/2026	08/01/26	01/10/27
40:21	05/01/26	04/10/26	05/16/26	06/30/26	07/20/26	08/27/2026	09/01/26	01/26/27
40:22	05/15/26	04/24/26	05/30/26	07/14/26	07/20/26	08/27/2026	09/01/26	02/09/27
40:23	06/01/26	05/08/26	06/16/26	07/31/26	08/20/26	09/29/2026	10/01/26	02/26/27
40:24	06/15/26	05/22/26	06/30/26	08/14/26	08/20/26	09/29/2026	10/01/26	03/12/27
41:01	07/01/26	06/10/26	07/16/26	08/31/26	09/20/26	10/29/2026	11/01/26	03/28/27
41:02	07/15/26	06/23/26	07/30/26	09/14/26	09/20/26	10/29/2026	11/01/26	04/11/27
41:03	08/03/26	07/13/26	08/18/26	10/02/26	10/20/26	11/24/2026	12/01/26	04/30/27
41:04	08/17/26	07/27/26	09/01/26	10/16/26	10/20/26	11/24/2026	12/01/26	05/14/27
41:05	09/01/26	08/11/26	09/16/26	11/02/26	11/20/26	12/17/2026	01/01/27	05/29/27
41:06	09/15/26	08/24/26	09/30/26	11/16/26	11/20/26	12/17/2026	01/01/27	06/12/27
41:07	10/01/26	09/10/26	10/16/26	11/30/26	12/20/26	01/28/2027*	02/01/27	06/28/27
41:08	10/15/26	09/24/26	10/30/26	12/14/26	12/20/26	01/28/2027*	02/01/27	07/12/27
41:09	11/02/26	10/12/26	11/17/26	01/04/27	01/20/27	02/25/2027*	03/01/27	07/30/27
41:10	11/16/26	10/23/26	12/01/26	01/15/27	01/20/27	02/25/2027*	03/01/27	08/13/27
41:11	12/01/26	11/05/26	12/16/26	02/01/27	02/20/27	03/25/2027*	04/01/27	08/28/27
41:12	12/15/26	11/20/26	12/30/26	02/15/27	02/20/27	03/25/2027*	04/01/27	09/11/27

*Dates not approved by RRC

This document is prepared by the Office of Administrative Hearings as a public service and is not to be deemed binding or controlling.

EXPLANATION OF THE PUBLICATION SCHEDULE

This Publication Schedule is prepared by the Office of Administrative Hearings as a public service and the computation of time periods are not to be deemed binding or controlling. Time is computed according to 26 NCAC 2C .0302 and the Rules of Civil Procedure, Rule 6.

GENERAL

The North Carolina Register shall be published twice a month and contains the following information submitted for publication by a state agency:

(1) temporary rules;
(2) text of proposed rules;
(3) text of permanent rules approved by the Rules Review Commission;
(4) emergency rules
(5) Executive Orders of the Governor;
(6) final decision letters from the U.S. Attorney General concerning changes in laws affecting voting in a jurisdiction subject of Section 5 of the Voting Rights Act of 1965, as required by G.S. 120-30.9H; and
(7) other information the Codifier of Rules determines to be helpful to the public.

COMPUTING TIME: In computing time in the schedule, the day of publication of the North Carolina Register is not included. The last day of the period so computed is included, unless it is a Saturday, Sunday, or State holiday, in which event the period runs until the preceding day which is not a Saturday, Sunday, or State holiday.

FILING DEADLINES

ISSUE DATE: The Register is published on the first and fifteen of each month if the first or fifteenth of the month is not a Saturday, Sunday, or State holiday for employees mandated by the State Human Resources Commission. If the first or fifteenth of any month is a Saturday, Sunday, or a holiday for State employees, the North Carolina Register issue for that day will be published on the day of that month after the first or fifteenth that is not a Saturday, Sunday, or holiday for State employees.

LAST DAY FOR FILING: The last day for filing for any issue is 15 days before the issue date excluding Saturdays, Sundays, and holidays for State employees.

NOTICE OF TEXT

EARLIEST DATE FOR PUBLIC HEARING: The hearing date shall be at least 15 days but not later than 60 days after the date a notice of the hearing is published.

END OF REQUIRED COMMENT PERIOD An agency shall accept comments on the text of a proposed rule for at least 60 days after the text is published.

DEADLINE TO SUBMIT TO THE RULES REVIEW COMMISSION: The Commission shall review a rule submitted to it on or before the twentieth of a month by the last day of the next month.

Board shall grant up to 200 additional hours if the applicant can demonstrate that further training or course-work related to the private protective services industry was received while obtaining the bachelor's degree.

(3) An applicant shall receive 1,200 hours of experience credit for a graduate degree. The Board shall grant an additional 300 additional hours if the applicant can demonstrate that further training or course-work related to the private protective services industry was received while obtaining the graduate degree.

(d) Persons licensed under Chapter 74D of the General Statutes of North Carolina may be issued a limited guard and patrol license exclusively for providing armed alarm responders.

Authority G.S. 74C-5; 74C-8; 93B-15.1.

SECTION .0700 - SECURITY GUARD REGISTRATION (UNARMED)

14B NCAC 16 .0705 UNARMED SECURITY GUARD REGISTRATION IDENTIFICATION CARDS

(a) The registration identification card shall be carried by the unarmed security guard registrant when performing the duties of a private protective services employee.

(b) The registration identification card shall be exhibited upon the request of any law enforcement officer or any other authorized representative of the Board.

(c) Registration identification card holders shall within five business days notify the Board upon receipt of any information relating to the holder's eligibility to continue holding such a card.

(d) The guard transfer online ~~form~~ form, a statement of the results of a statewide criminal history records search by the reporting service designated by the Board pursuant to G.S. 74C-8.1(a) for each state where the applicant has resided within the preceding 12 months, and fee shall be submitted to the Board by the employer within ~~10~~ 30 days of ~~the beginning of~~ permanent, non-probationary employment.

~~(e) Upon revocation or suspension by the Board, a holder shall return the registration identification card to the administrator within 10 days of the date of the revocation or suspension.~~

Authority G.S. 74C-5; 74C-11.

SECTION .1300 – ARMORED CAR SERVICE GUARD REGISTRATION (UNARMED)

14B NCAC 16 .1305 UNARMED ARMORED CAR SERVICE GUARD REGISTRATION IDENTIFICATION CARDS

(a) A registration identification card shall be carried by ~~an~~ the armored car service guard registrant when performing the duties of a private protective services employee.

(b) The registration identification card shall be exhibited upon the request of any law enforcement officer or any authorized representative of the Board.

(c) Registration identification card holders shall within five business days notify the Board following receipt of any information relating to the holder's eligibility to continue holding the card.

(d) The guard transfer ~~form~~ form, a statement of the results of a statewide criminal history records search by the reporting service designated by the Board pursuant to G.S. 74C-8.1(a) for each state where the applicant has resided within the preceding 12 months, and fee shall be submitted to the Board by the employer within ~~10~~ 30 days of ~~the beginning of~~ permanent, non-probationary employment.

~~(e) Upon revocation or suspension by the Board, a holder shall return the registration identification card to the Director within 10 days of the date of the revocation or suspension.~~

Authority G.S. 74C-3; 74C-5.

TITLE 15A – DEPARTMENT OF ENVIRONMENTAL QUALITY

***Notice** is hereby given in accordance with G.S. 150B-21.2 that the Marine Fisheries Commission intends to adopt the rule cited as 15A NCAC 03M .0524.*

Link to agency website pursuant to G.S. 150B-19.1(c): *https://deq.nc.gov/mfc-proposed-rules*

Proposed Effective Date: *Subject to Legislative Review*

Public Hearing:
Date: *August 26, 2026*
Time: *6:00 p.m.*
Location: *WebEx Register link: https://ncgov.webex.com/weblink/register/rd413a5ff71720d465fd9b2fe0fe71df9 WebEx Events meeting link: https://ncgov.webex.com/ncgov/j.php?MTID=md3d30700b6f0c3c5fe2ba5308cd59903 Webinar number: 2439 876 2166 Webinar password: 1234 Webinar phone number: 1-415-655-0003 Access code: 2439 876 2166 Listening station: Division of Marine Fisheries Central District Office, 5285 Highway 70 West, Morehead City, NC 28557*

Reason for Proposed Action: *The proposed rule adoption would implement a five-fish bag limit and otherwise delegate proclamation authority to the Fisheries Director to manage the Atlantic bonito (Sarda sarda) fishery, with prior consent of the Marine Fisheries Commission (MFC) before a proclamation is issued. Landings of Atlantic bonito from the recreational sector have increased in state waters over the last 10 years, and North Carolina accounts for 22% of the overall coastwide landings. Trends in the number of recreationally harvested fish have increased while trends in the number of released fish have remained stable over this time. Atlantic bonito is incidentally caught by commercial fishers pursuing other species; there is not a targeted fishery at this time. Atlantic bonito has a limited shelf life as a fresh product and is not desirable in frozen form. Little information exists on the status of Atlantic bonito in North Carolina, so their stock status is considered unknown, and the species is not managed at either the state or federal level, except Massachusetts. The MFC is seeking to adopt a rule to have the*

ability to manage this fishery as more data continues to be collected and the apparent popularity of the recreational fishery increases.

Comments may be submitted to: *Catherine Blum, P.O. Box 769, Morehead City, NC 28557*

Written comments may also be submitted via an online form available at https://deq.nc.gov/mfc-proposed-rules.

Comment period ends: *October 2, 2026*

Rule(s) is automatically subject to legislative review: *S.L. 2019-198*

Fiscal impact. Does any rule or combination of rules in this notice create an economic impact? Check all that apply.

☐ **State funds affected**
☐ **Local funds affected**
☐ **Substantial economic impact (>= $1,000,000)**
☒ **Approved by OSBM**
☐ **No fiscal note required**

CHAPTER 03 - MARINE FISHERIES

SUBCHAPTER 03M - FINFISH

SECTION .0500 – OTHER FINFISH

15A NCAC 03M .0524 ATLANTIC BONITO

(a) It shall be unlawful to possess more than five Atlantic bonito per person per day for recreational purposes.
(b) The Fisheries Director may, with prior consent of the Marine Fisheries Commission, by proclamation and pursuant to 15A NCAC 03H .0103, impose any of the following requirements on the taking of Atlantic bonito:

(1) specify time;
(2) specify area;
(3) specify means and methods;
(4) specify season;
(5) specify size; and
(6) specify quantity, except as provided in Paragraph (a) of this Rule.

Authority G.S. 113-134; 113-182; 113-221.1; 143B-289.52.

TITLE 21 - OCCUPATIONAL LICENSING BOARDS AND COMMISSIONS

CHAPTER 06 - BARBER AND ELECTROLYSIS EXAMINERS

***Notice** is hereby given in accordance with G.S. 150B-21.2 that the Board of Barber and Electrolysis Examiners intends to adopt the rule cited as 21 NCAC 06O .0202, and amend the rules cited as 21 NCAC 06O .0101-.0104, .0118, and .0121.*

Link to agency website pursuant to G.S. 150B-19.1(c): *https://www.bbee.nc.gov/news/rulemaking*

Proposed Effective Date: *December 1, 2026*

Public Hearing:
Date: *August 19, 2026*
Time: *10:30 a.m.*
Location: *By videoconference at https://bit.ly/august-2026-rulemaking-hearing or by telephone at 984-204-1487, conference ID 752 885 07#*

Reason for Proposed Action: *The board is increasing or establishing various civil penalties to improve the board's ability to prevent unlawful practice of barbering, electrolysis, and laser hair practice.*

Comments may be submitted to: *Dennis Seavers, 7001 Mail Service Center, Raleigh, NC 27699-7000; phone (919) 814-0641; email dennis.seavers@nc.gov*

Comment period ends: *October 2, 2026*

Procedure for Subjecting a Proposed Rule to Legislative Review: If an objection is not resolved prior to the adoption of the rule, a person may also submit a written objection to the Rules Review Commission. If the Rules Review Commission receives written and signed objections after the adoption of the Rule in accordance with G.S. 150B-21.3(b2) from 10 or more persons clearly requesting review by the legislature and the Rules Review Commission approves the rule, the rule will become effective as provided in G.S. 150B-21.3(b1). The Commission will receive written objections until 5:00 p.m. on the day following the day the Commission approves the rule. The Commission will receive letters via U.S. Mail, private courier service, or hand delivery to 1711 New Hope Church Road, Raleigh, North Carolina, or via email to oah.rules@oah.nc.gov. If you have any further questions concerning the submission of objections to the Commission, please review 26 NCAC 05 .0110 or call a Commission staff attorney at 984-236-1850.

Fiscal impact. Does any rule or combination of rules in this notice create an economic impact? Check all that apply.

☐ **State funds affected**
☐ **Local funds affected**
☐ **Substantial economic impact (>= $1,000,000)**
☐ **Approved by OSBM**
☒ **No fiscal note required**

SUBCHAPTER 06O – CIVIL PENALTY

21 NCAC 06O .0101 SCHEDULE OF PENALTIES

The rules in this Subchapter establish the schedule of civil penalties required by ~~G.S. 86A-27(c).~~ G.S. 86B-10(c). The amounts stated are the presumptive amounts that may be modified in accordance with ~~G.S. 86A-27(b).~~ G.S. 86B-10(b).

Authority ~~G.S. 86A-5(a)(6); 86A-27;~~ G.S. 86B-2; 86B-10.

Fiscal Impact Analysis of Proposed Atlantic Bonito Management Rule

Rule Proposal: 15A NCAC 03M .0524

Name of Commission: N.C. Marine Fisheries Commission

Agency Contact: Jason Walsh, Fisheries Economics Program Manager
N.C. Division of Marine Fisheries
3441 Arendell Street
Morehead City, NC 28557
Jason.walsh@deq.nc.gov
252-269-9299

Impact Summary: State government: No
Local government: No
Federal government: No
Substantial impact: No

AUTHORITY

N.C. General Statutes

G.S. 113-134.	Rules.
G.S. 113-182.	Regulation of fishing and fisheries.
G.S. 113-221.1.	Proclamations; emergency review.
G.S. 143B-289.52.	Marine Fisheries Commission – powers and duties.

Necessity: The need for management of Atlantic bonito (*Sarda sarda*) has emerged from growing concern among North Carolina Marine Fisheries Commission (NCMFC) members and the public about increasing recreational fishing pressure and the absence of a rule to implement management measures for this species. North Carolina does not currently have any means to manage the Atlantic bonito fishery, and the MFC is seeking this proposed rule to be prepared if the fishery continues to expand.

I. Summary

Atlantic bonito landings from the recreational sector have increased in state waters over the last 10 years and North Carolina accounts for 22% of the overall coastwide landings. Additionally, trends in the number of recreationally harvested fish have increased while trends in the number of released fish have remained stable over this time (Table 1). Currently, there is no targeted commercial fishery for Atlantic bonito in North Carolina. Due to the opportunistic nature of the fishery, commercial trips typically land less than 50 pounds per trip, with trips exceeding 300 pounds making up less than 5% of the total number of trips in state and federal waters. Further, there does not appear to be an immediate biological concern for the Atlantic bonito stock since there is no evidence of size truncation in the commercial and recreational fisheries over the past decade, and most fish are caught at or above the size where fifty percent or more of the fish are mature (L_{50}), which is 15 inches fork length in Atlantic bonito, except in the most recent two years of recreational data (2023, 2024). Although current data do not indicate an immediate

biological concern, the available information is not sufficient to demonstrate that the recent increase in harvest is sustainable over the long term.

For that reason, the NCMFC is proposing a rule that would do two things. First, it would establish a five-fish recreational bag limit, which is intended primarily as a precautionary cap; based on current harvest patterns, it is not expected to have a major near-term effect because anglers are not commonly retaining that many fish per trip. Second, it would grant the Fisheries Director proclamation authority, with prior NCMFC consent, to implement additional management measures more quickly if future conditions warrant action. In practice, the five-fish limit functions as an early management threshold, while the proclamation authority creates a mechanism for faster response if landings or stock conditions change.

If adopted, the immediate practical effect of the bag limit is expected to be limited, because current harvest patterns indicate that anglers rarely retain that many fish per trip. It would also provide a management framework for responding to future variable conditions (N.C.G.S. § 113-221.1) in the fishery without the delay associated with additional rulemaking. In that sense, the rule's most significant effect is not a change in current fishing behavior, but improved management readiness if conditions are variable.

The measures are not expected to reduce participation in Atlantic bonito recreational fishing, as the majority of Atlantic bonito fishing is catch-and-release or consists of catches less than five fish per trip (Table 2), which will not be restricted by the proposed management measures. The effect on commercial fishing is likely to be minimal as Atlantic bonito have low commercial value in the United States (Table 3), and they are only incidentally caught by commercial fishers pursuing other species with gill nets and hook-and-line gear.

II. Introduction and Purpose of Rule Proposal

Atlantic Bonito Life History

Atlantic bonito (*Sarda sarda*) is a small tuna species in the mackerel/tuna family Scombridae. Its body is spindle-shaped, with bluish to greenish shades dorsally, fading to silvery below. The upper sides have numerous diagonal dark stripes, with underlying diffuse dark bars. Anglers often confuse Atlantic bonito with false albacore (*Euthynnus alletteratus;* also called little tunny) and skipjack tuna (*Katsuwonus pelamis*) due to similarity in size and coloration. In addition to general misidentification, there is also significant confusion regarding the use of the same common name for many of these species. Many people, including anglers, often use names like "bonito," "bonita," "little tunny,", and "skipjack" interchangeably, and these common names can vary regionally.

A predominantly coastal species, Atlantic bonito are found in the Eastern Atlantic from Oslo, Norway, to Port Elizabeth, South Africa, as well as in the Mediterranean and Black seas. In the Western Atlantic, they range from Nova Scotia, Canada, to the Gulf of Mexico, and south to northern Argentina, but are apparently absent from most of the Caribbean Sea (Collette and Nauen 1983). Atlantic bonito school with similarly sized Scombrid species (Yoshida 1980), and most likely migrate north during the summer and early fall and south in the winter, but there is a

lack of scientific documentation of these migrations. Current tagging studies are underway by North Carolina State University, the Nature Conservancy, and the American Saltwater Guides Association to conduct research on Atlantic bonito migratory patterns on the East Coast of the United States.

Interjurisdictional Atlantic Bonito Management

Little information exists on the status of Atlantic bonito in the Western Atlantic, and as a result their stock status is considered unknown. Internationally, small tunas, including Atlantic bonito, are assessed and managed by the International Commission for the Conservation of Atlantic Tunas (ICCAT) in the Small Tunas Species Group. Currently, the small tunas in the Atlantic are divided into five stock regions based on traditional ICCAT management areas: Northwest Atlantic, Southwest Atlantic, Northeast Atlantic, Southeast Atlantic, and Mediterranean. Atlantic bonito are one of 13 species in the Small Tunas Species Group. Of these 13 species, the seven most important, Atlantic bonito (31%), little tunny (18%), frigate tuna (13%) king mackerel (12%), Spanish mackerel (9%), bullet tuna (5%), and wahoo (4%), represent about 91% of nominal catches between 1950 and 2023. Although there is currently no ICCAT assessment or management plan for Atlantic bonito, it has been identified as a species for which more data should be collected for stock assessment (ICCAT 2019). Genetic studies have shown that there is genetic isolation between both sides of the Atlantic Ocean (Viñas et al. 2010), and clear heterogeneity among Eastern Atlantic and Mediterranean populations (Viñas et al. 2020). These studies suggest that Atlantic bonito might have multiple stock units in the Atlantic Ocean and the Mediterranean Sea that disagree with the management areas adopted by ICCAT (Viñas et al. 2020).

National fisheries regulations in the Eastern Atlantic have recently been implemented. The Turkish Ministry of Agriculture and Forestry has set a seasonal ban on all recreational and sport fishing for Atlantic bonito along all coastal regions from April 1 to August 14. These regulations are part of a nationwide initiative to safeguard marine biodiversity during peak spawning months. Outside of this time frame, regulations are a minimum size of 25 cm (10 inches) with a 5 kg (11 lb) daily limit per angler (Sport Fishing Türkiye 2025).

In the United States, the only state that has adopted regulations for Atlantic bonito is Massachusetts. In May of 2025, the Massachusetts Division of Marine Fisheries enacted the first-ever size and possession limits for both false albacore (little tunny) and Atlantic bonito. The minimum size limit for both species is 16 inches curved FL and reflects the estimated size-at-maturity for both species. Additionally, retention is limited to no more than five fish per person per day of both species combined and applies only to fish caught and possessed in state waters (0-3 miles). These new limits apply universally to all persons whether commercially or recreationally fishing; however, there are bycatch exemptions for commercial fish weirs and mechanized mackerel jigging operations, as sorting and discarding the bycatch would be unduly burdensome for these fisheries. Massachusetts has seen considerable growth in the fishery without the benefit of stock assessments, extensive understanding of species life history, or fishery management plans (FMPs) to control fishing mortality. As a result, the Massachusetts Division of Marine Fisheries chose to adopt these precautionary management measures until a time when a more robust science and management program is implemented. The new possession

limits are designed to constrain recreational harvest approximately at current levels and discourage further expansion while curtailing the development of a directed commercial fishery (Commonwealth of Mass. DMF 2025).

Currently, there are no rules for management in place for Atlantic bonito in any other states, but some states are considering management. Management is not currently being pursued, though it has been discussed by the ASMFC, the SAFMC, and the MAFMC. At the August 2016 MAFMC meeting, council staff recommended the Council consider developing management actions for the species in the future (including a potential small tuna FMP), due to a high level of public concern for the species, particularly from the recreational sector. The ASMFC Interstate Fisheries Management Program Policy Board (Policy Board) tasked ASMFC staff in February 2022 to present an options paper on possible paths forward for management of Atlantic bonito and false albacore after concerns were raised regarding increased recreational harvest of juvenile fish in some state waters. Staff presented possible options for developing different paths to management for both Atlantic bonito and false albacore at the May 2023 ASMFC Policy Board meeting. The information also included the states' ability to regulate a species and timing to implement measures without an ASMFC FMP. ASMFC staff noted that if additional species were added to the ASMFC portfolio, it would increase the workload for ASMFC and state staff, some of which are already at full capacity. Although some member states are interested in management measures for these species, ASMFC's Policy Board decided not to pursue management at the interstate level. Similarly, management of Atlantic bonito through a small tuna FMP has not been pursued yet by a federal management body.

Proposed N.C. Atlantic Bonito Management

At its May 2024 business meeting, the NCMFC passed a motion to request N.C. Division of Marine Fisheries (NCDMF) staff develop an issue paper for Atlantic bonito management, including landings information and proposed rule language, using the previous sheepshead issue paper (February 11, 2013) as a model to follow. Discussions among commissioners noted concerns expressed by recreational stakeholders about angler behavior changing in targeting Atlantic bonito in more recent years and the potential need to implement a recreational bag limit. Further concerns expressed by the NCMFC identified limited information about Atlantic bonito in this part of the Atlantic Ocean and no measure of stock status for the population, and whether these recent increases in recreational catches may not be due to more fish, but rather due to changes in fishing tactics and new technologies available to recreational anglers to improve their success in catching Atlantic bonito when available in state waters. Commissioners did not express concern for commercial catches due to Atlantic bonito having a limited shelf life as a fresh product and not being desirable frozen as likely reasons behind no similar increase in commercial harvest. Potential waste of the resource was discussed, since there are no current limits on Atlantic bonito. The NCMFC also identified the need to learn more about the fisheries and develop rule language in order to implement regulations to get ahead of a potential problem. Commissioners continued discussions on Atlantic bonito at their August and November 2024, and May 2025 business meetings with an urgency to be proactive in their management and continued to stress the need to implement a bag limit in the recreational fishery.

At the August 2025 NCMFC business meeting, NCDMF staff presented background information, which outlined life history and catch characteristics of Atlantic bonito. Commissioners discussed that Atlantic bonito appear to behave differently off southeast North Carolina than in other locations along the coast, showing preference for structure and pondered if these preferences are associated with spawning thereby making Atlantic bonito more vulnerable to harvest. Commissioners mentioned that the presentation illustrated the increasing trends in the recreational landings with smaller fish being caught in recent years and discussed the potential for implementing both a bag limit and possibly a size limit on the recreational sector. A commissioner stressed that in their own capture of Atlantic bonito the fish have a mouth-to-gills structure more like Spanish mackerel and therefore the hooks are often closer to the gills creating higher potential for release mortality. The commissioner therefore expressed hesitation to consider a size limit as it could increase discards. Smaller Atlantic bonito appear later in the season often mixed in with Spanish mackerel and regardless will result in the catch of smaller fish. The stated intention behind the NCMFC adopting a rule to delegate broad proclamation authority to the Fisheries Director is to implement a recreational bag limit soon after the rule becomes effective. The NCMFC passed a motion for NCDMF staff to bring proposed rulemaking language for a five-fish recreational bag limit per person for Atlantic bonito to its November 2025 business meeting. At the November 2025 NCMFC business meeting several proposed rulemaking options were presented, followed by a brief discussion of next steps in the rulemaking process. At the February 2026 NCMFC business meeting, the NCMFC selected a management option that would implement a five-fish recreational bag limit and delegate the authority for the Fisheries Director to issue a proclamation to manage all other parameters of the commercial and recreational fisheries with prior NCMFC consent.

Summarizing the available data, landings from the recreational sector have increased in state waters over the last 10 years and North Carolina accounts for 22% of the overall coastwide landings. Additionally, trends in the number of recreationally harvested fish have increased while trends in the number of released fish have remained stable over this time. Currently, there is no targeted commercial fishery for Atlantic bonito in North Carolina. Due to the opportunistic nature of the fishery, commercial trips typically land less than 50 pounds per trip, with trips exceeding 300 pounds making up less than 5% of the total number of trips in state and federal waters. Further, there appears to be no biological concern for the Atlantic bonito stock since there is no evidence of size truncation in the commercial and recreational fisheries over the past decade, and most fish are caught at or above the L_{50} (15 inches FL) except in the most recent two years of recreational data (2023, 2024). Likewise, there is no biological evidence that higher harvest in recent years is sustainable. While these trends do not indicate the need for immediate management, it would be prudent to continue to monitor landings and collect additional biological information for this species.

The proposed rule delegates authority to the Fisheries Director to issue a proclamation to address variable conditions in the Atlantic bonito fishery to manage time, area, means and methods, season, size, and except for a bag limit of five fish per person per day for recreational purposes that would be set in rule. Implementation of the proposed rule, once in effect, would include formal monitoring of the commercial and recreational Atlantic bonito fisheries by the NCDMF. Formal monitoring would mean NCDMF annually providing a landings summary with trends in

the fishery, length frequency distributions, updates on any biological studies, and any changes in management that may occur at the state and federal level to the NCMFC at its first business meeting after July 1, typically occurring in August. Including NCMFC consent in the rule provides the opportunity during a public meeting for the NCMFC to review and discuss the proposed issuance of a proclamation since there is no baseline stock assessment of Atlantic bonito and no FMP to address adaptive management when landings are variable year to year.

III. Fiscal Analysis

The purpose of this document is to examine the potential economic impacts (costs and benefits) of the proposed Atlantic bonito management rule.

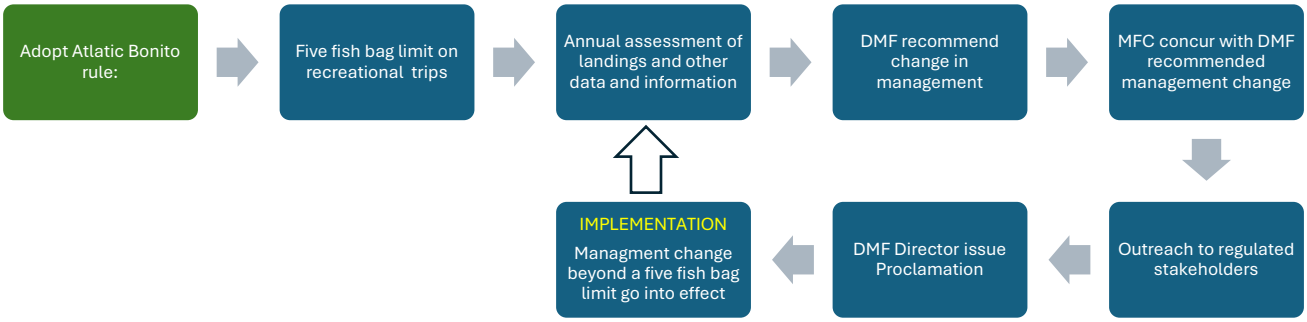
In the near term, the rule would impose a five-fish recreational bag limit. This restriction could reduce harvest for anglers who currently retain more than five Atlantic bonito per trip. However, NCDMF's collected data indicate that most recreational trips land less than five fish, and because many recreational Atlantic bonito fishing trips are catch-and-release and the available catch and trip data are imprecise, NCDMF cannot reliably estimate the magnitude of any resulting change in harvest, effort, or discards. Supporting data are provided in the companion document. "Atlantic Bonito Management Issue Paper" that was presented to the NCFMC at its February 2026 business meeting located here: [https://www.deq.nc.gov/marine-fisheries/marine-fisheries-commission/february-2026/atlantic-bonito-issue-paper/open].

The rule would also establish proclamation authority for the Fisheries Director, with prior NCMFC consent, to implement additional management measures if future conditions warrant action. Although any additional restrictions would depend on future biological or fishery conditions, establishing this framework in advance provides regulatory certainty to the regulated community regarding the types of measures that could be implemented. It may also improve compliance slightly if a proclamation is issued in the future, because stakeholders would already have notice of the potential management tools available. It is also possible that no additional management measures would ever be implemented beyond the five-fish recreational bag limit.

The costs to the regulated community would primarily consist of reduced harvest opportunities under the five-fish bag limit and any future restrictions that may be adopted through proclamation. Recreational fishers who do not retain Atlantic bonito, or who retain five or fewer fish per trip, would not be affected by the bag limit. The proposed rule is not expected to create costs for the State because enforcement of the bag limit and any future proclamation-based measures would occur through existing Marine Patrol duties without requiring additional resources.

The rule's primary long-term benefit would be to expedite implementation of additional management measures if changes in commercial or recreational trends, length frequency distributions, biological studies, or state and federal management indicate that further action is needed. Figure 1 below illustrates the steps that would follow adoption of the rule if additional management measures were later implemented through proclamation.

Figure 1. Steps from Adoption of Rule to Implementation



IV. Conclusion

Although the rule's near-term effects are expected to be minimal and its long-term benefits are not readily quantifiable due to data limitations and uncertainty about future conditions, the rule would provide three real advantages: (1) a precautionary harvest cap, (2) regulatory certainty about potential future management tools, and (3) faster, transparent response capability through proclamation authority with prior public NCMFC consent. These improvements would enhance NCDMF's ability to manage Atlantic bonito sustainably while preserving public participation in the process, ultimately benefiting both the species and North Carolina's marine resources users.

Because additional management measures may never be needed, and because the available data are highly imprecise, it is impractical to predict the likelihood of realizing costs and benefits associated with future proclamation-based management. Any such measures could be implemented only through the Fisheries Director's use of proclamation authority, with prior consent from the NCMFC. That prior consent would be considered at an NCMFC business meeting, where the public may attend and provide comment in advance of and during the meeting.

Table 1. Recreational harvest (number of fish landed and weight in pounds) and releases (number of fish) and commercial harvest (weight in pounds) of Atlantic bonito from North Carolina for the period 1994–2025. Data with an asterisk is preliminary (up to October for recreational and up to September for commercial) and not included in averages. PSE is Percent Standard Error. (Source: Marine Recreational Information Program and North Carolina Trip Ticket Program)

	Recreational						Commercial	
Year	# Landed	PSE	# Released	PSE	Weight Landed (lb)	PSE	Weight (lb)	Total Weight (lb)
1994	11,860	48.2	18,933	48.6	23,712	56.7	37,372	61,084
1995	10,528	73.8	2,407	49.2	41,312	80.6	34,717	76,029
1996	864	58.2	10,845	56.1	5,394	71.9	16,267	21,661
1997	31,090	41.4	29,816	52.7	162,980	41.8	42,372	205,352
1998	13,513	68.4	8,836	72.7	145,837	87.7	21,352	167,189
1999	6,045	44.8	2,682	73	38,657	44.2	23,291	61,948
2000	13,617	93.4	9,257	58.4	69,579	89.9	13,343	82,922
2001	7,722	48.2	5,001	56.1	23,603	50.7	16,531	40,134
2002	28,728	64	30,165	65.7	97,115	66.1	15,456	112,571
2003	2,275	58.8	12,968	50.9	6,685	51.2	27,379	34,064
2004	10,274	56.6	19,082	39.3	48,251	57.3	9,302	57,553
2005	2,102	76.6	42,363	98.6	9,388	73.8	11,672	21,060
2006	1,037	102.4	2,755	51.4	4,457	102.4	9,770	14,227
2007	7,685	48.1	4,523	41.8	34,693	46.3	16,085	50,778
2008	5,230	56.8	23,411	61.1	39,093	61.8	16,576	55,669
2009	1,380	71.8	2,561	92.2	13,799	85.4	9,981	23,780
2010	447	42.4	16,583	41.6	8,019	47.1	15,686	23,705
2011	21,235	73.1	28,618	42.1	287,458	66.4	11,039	298,497
2012	6,913	37.1	7,858	35.6	95,947	49.3	11,343	107,290
2013	19,182	59.9	4,609	41.3	99,252	55.4	10,506	109,758
2014	18,379	49.3	59,926	62.7	91,227	53.6	9,081	100,308
2015	16,973	44.8	1,325	60.8	102,408	42.8	20,989	123,397
2016	3,411	64.7	10,196	45.2	22,127	60.3	14,838	36,965
2017	1,999	45.6	40,094	75.6	9,579	53	11,345	20,924
2018	12,577	42.5	11,745	66.4	42,879	49.7	13,848	56,727
2019	35,875	66.6	24,033	66.1	122,931	48.6	14,045	136,976
2020	52,337	50.9	23,818	55.3	179,803	47.9	15,926	195,729
2021	20,178	26.6	7,793	44.5	104,789	29.1	7,351	112,140
2022	12,301	45.4	11,763	70.7	70,411	45.7	6,576	76,987
2023	72,973	40.4	31,930	70.4	268,260	36.8	17,876	286,136
2024	61,813	34.4	7,513	48.6	130,686	43.2	12,100	142,786
2025	96,013*	26.9*	36,892*	27.5*	303,905*	28.6*	32,326*	336,231*
Average	16,469	56	16,562	58	77,430	58	16,581	94,011

A PSE value greater than 50 indicates very imprecise estimates.

A PSE value between 30 and 50 indicates using the data with caution.

A PSE value less than 30 indicates estimates have a relatively low margin of error.

Table 2. Maximum, minimum, and average recreational landings and release rates (numbers per trip) in North Carolina by area, 2011-2024. (Source: Marine Recreational Information Program)

		Landings			Releases		
Year	Area	Average	Minimum	Maximum	Average	Minimum	Maximum
2011	State	1.7	0.0	1.7	0.5	0.0	0.5
	Federal	0.4	0.0	0.4	1.9	0.0	1.9
2012	State	0.8	0.0	0.8	1.1	0.0	1.1
	Federal	0.8	0.0	0.8	0.8	0.0	0.8
2013	State	2.4	0.0	2.4	0.3	0.0	0.3
	Federal	0.5	0.0	0.5	0.8	0.0	0.8
2014	State	1.7	0.0	1.7	3.6	0.0	3.6
	Federal	0.4	0.0	0.4	4.8	0.0	4.8
2015	State	2.9	0.0	2.9	0.1	0.0	0.1
	Federal	1.4	0.0	1.4	0.1	0.0	0.1
2016	State	0.5	0.0	0.5	0.7	0.0	0.7
	Federal	0.2	0.0	0.2	1.0	0.0	1.0
2017	State	0.2	0.0	0.2	9.2	0.0	9.2
	Federal	0.3	0.0	0.3	1.5	0.0	1.5
2018	State	1.2	0.0	1.2	0.8	0.0	0.8
	Federal	1.1	0.0	1.1	1.2	0.0	1.2
2019	State	3.0	0.0	3.0	1.7	0.0	1.7
	Federal	1.2	0.0	1.2	1.8	0.0	1.8
2020	State	3.8	0.0	3.8	1.0	0.0	1.0
	Federal	0.9	0.0	0.9	1.7	0.0	1.7
2021	State	1.3	0.0	1.3	0.6	0.0	0.6
	Federal	1.1	0.0	1.1	0.3	0.0	0.3
2022	State	1.1	0.0	1.1	0.2	0.0	0.2
	Federal	0.9	0.0	0.9	2.8	0.0	2.8
2023	State	2.9	0.0	2.9	2.2	0.0	2.2
	Federal	1.8	0.0	1.8	0.1	0.0	0.1
2024	State	2.0	0.0	2.0	0.3	0.0	0.3
	Federal	1.7	0.0	1.7	0.2	0.0	0.2

Table 3. North Carolina commercial landings in pounds by gear and value, 1994-2024. (Source: North Carolina Trip Ticket Program)

	Gear					
Year	Gill Nets	Hook & Line	Other*	Total	Value	Price/Pound
1994	30,848	5,742	782	37,372	$14,201	$0.38
1995	29,576	4,999	143	34,717	$6,943	$0.20
1996	5,880	10,015	372	16,267	$3,843	$0.24
1997	35,689	6,119	564	42,372	$9,455	$0.22
1998	17,030	4,260	63	21,352	$24,199	$1.13
1999	11,083	12,196	12	23,291	$20,832	$0.89
2000	6,240	7,089	14	13,343	$18,798	$1.41
2001	11,814	4,689	28	16,531	$10,433	$0.63
2002	5,058	10,384	14	15,456	$11,741	$0.76
2003	19,494	7,763	122	27,379	$18,563	$0.68
2004	5,521	3,706	76	9,302	$9,086	$0.98
2005	174	10,898	600	11,672	$7,286	$0.62
2006	5,501	4,099	170	9,770	$10,503	$1.08
2007	4,382	11,683	20	16,085	$20,403	$1.27
2008	8,310	8,101	165	16,576	$19,937	$1.20
2009	3,359	6,422	200	9,981	$14,060	$1.41
2010	12,985	2,435	266	15,686	$20,152	$1.28
2011	5,160	4,890	989	11,039	$20,041	$1.82
2012	7,173	3,879	291	11,343	$15,833	$1.40
2013	2,666	7,721	119	10,506	$15,460	$1.47
2014	3,969	4,771	341	9,081	$14,386	$1.58
2015	13,100	7,664	225	20,989	$32,905	$1.57
2016	10,487	4,346	6	14,838	$26,780	$1.80
2017	7,084	4,130	131	11,345	$20,261	$1.79
2018	8,248	5,552	48	13,848	$25,228	$1.82
2019	10,256	3,705	84	14,045	$15,556	$1.11
2020	10,824	5,062	41	15,926	$12,835	$0.81
2021	4,649	2,646	56	7,351	$16,620	$2.26
2022	4,689	1,775	112	6,576	$12,544	$1.91
2023	15,744	1,972	160	17,876	$30,287	$1.69
2024	8,583	3,279	238	12,100	$19,733	$1.63

*Other gear includes seines, trawls, and pound nets

Appendix I.: Proposed Rule Changes

15A NCAC 03M .0524 is proposed for adoption as follows:

15A NCAC 03M .0524 ATLANTIC BONITO

(a) It shall be unlawful to possess more than five Atlantic bonito per person per day for recreational purposes.

(b) The Fisheries Director may, with prior consent of the Marine Fisheries Commission, by proclamation and pursuant to 15A NCAC 03H .0103, impose any of the following requirements on the taking of Atlantic bonito:

(1) specify time;

(2) specify area;

(3) specify means and methods;

(4) specify season;

(5) specify size; and

(6) specify quantity, except as provided in Paragraph (a) of this Rule.

History Note: *Authority G.S. 113-134; 113-182; 113-221.1; 143B-289.52*

Appendix II.: Literature Cited

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Public Comments on MFC 2026-2027 Proposed Atlantic Bonito Rule
October 2, 2026

Created	Name	Address: City	Address: State	Are your comments for or against the proposed rulemaking?	Please enter your comments on proposed changes to the rules and cite the rule or rules on which you are commenting.
10/1/2026 12:21	Abby Mcgregor	Ocean Springs	Mississippi	For	
10/1/2026 12:17	Adrian Draughn	Biloxi	Mississippi	For	I think a bag limit is essential for helping ensure the bonito fishery remains stable for future generations.
10/1/2026 12:19	Alena Anderson	Ocean Springs	Mississippi	For	
10/1/2026 13:17	Barton Lewis	Lynn Haven	Florida	For	Needs some kind of limit instead of making cat food
8/17/2026 0:00	Bennie L Braswell		North Carolina	For	[Online comment for August 2026 MFC business meeting:] I agree with the limit on Bonito. But not the overall policies currently in place
8/26/2026 18:00:00	Blane Chocklett		Virginia	For	[Provided public comment at August 26, 2026 MFC hearing for proposed rule]
10/2/2026 10:52	Blane Chocklett	Troutville	Virginia	For	I've been traveling to fishing coastal North Carolina for more than 30 years. Coastal North Carolina's fishing it produces. Coastal North Carolina is one of my favorite places to visit each year for the beauty and the fishing it offers. I support the proposed five-fish recreational bag limit for Atlantic Bonito and the Director's proclamation authority with Commission consent. Bonito are currently unmanaged in North Carolina. This rule sets a sensible baseline and lets managers respond if the fishery changes. Please approve it. Thank you for your time All the best Blane Chocklett
9/30/2026 20:52	Brendan Curley	Medway	Massachusetts	For	I'm a college student and angler who fishes for Atlantic bonito in Massachusetts every season. I support the proposed five-fish recreational bag limit and the Director's proclamation authority with Commission consent. Bonito are an important resource to me and to the fishing community around me, and I want to help protect them for the future. Please approve this proposal.

Public Comments on MFC 2026-2027 Proposed Atlantic Bonito Rule
October 2, 2026

Created	Name	Address: City	Address: State	Are your comments for or against the proposed rulemaking?	Please enter your comments on proposed changes to the rules and cite the rule or rules on which you are commenting.
8/29/2026 8:49	Brian Sittlow	Westerly	Rhode Island	For	I support the implementation of an Atlantic Bonito 5 fish per day bag limit. Atlantic Bonito is a coast wide migratory species. The benefits of North Carolina's management decisions will have positive impact across the coast. Hopefully, states like RI and others will follow this pattern to manage conservatively and protect this species that so many enjoy. With kind regards, Brian Sittlow CAPT, US Navy (ret) Westerly, RI
10/1/2026 12:00	Brooke Rice	Traverse City	Michigan	Against	Proposing a 5 fish Bonita limit for anglers instead of removing all Regulations - the fishing industry needs some regulation for longevity- thank you
10/1/2026 12:22	Carly Standbridge	Ocean Springs	Mississippi	For	

Public Comments on MFC 2026-2027 Proposed Atlantic Bonito Rule
October 2, 2026

Created	Name	Address: City	Address: State	Are your comments for or against the proposed rulemaking?	Please enter your comments on proposed changes to the rules and cite the rule or rules on which you are commenting.
10/1/2026 20:47	Chris Thompson	Hubert	North Carolina	For	Regarding 15A NCAC 03M .0524 ATLANTIC BONITO Comments in favor of the rule provided on behalf of the Cape Lookout Albacore Foundation which was founded for charitable and educational purposes, specifically aimed at conserving and understanding the coastal fisheries of North Carolina. Atlantic Bonito are an important seasonal fishery for many guides and recreational anglers on the North Carolina Coast. Ensuring the health of this species protects both the resource and the businesses that rely upon it and supports sustainable recreational fishing. The proposed management rule establishes a baseline for responsible harvest and is consistent with good stewardship of a public resource. Proactive, reasonable management of a healthy fishery is preferable to reactive, corrective management to a depleted one. The North Carolina Marine Fisheries Commission Fiscal Impact of Proposed Atlantic Bonito Management Rule document published observed there are no management rules in place for Atlantic Bonito, and landings from the recreational sector have risen over the past 10 years. The document concludes that North Carolina accounts for 22% of the overall coastwide harvest of the species. This document concludes the proposed rule would, enhance the Department of Marine Fisheries' ability to manage Atlantic Bonito sustainably while preserving public participation in the process, ultimately benefitting the both the species and North Carolina's marine resources users. The Cape Lookout Albacore Foundation concurs with this rationale. A five-fish limit is a mild, practical first step. We support the flexibility provided to the Fisheries Director to respond rapidly should conditions change. Supporting the rule now mitigates the risk of more restrictive measures being required in the future. We urge the Commission to adopt the five-fish rule. What we do here in North Carolina can serve as an example to other states. Responsible stewardship is founded in ensuring future generations may enjoy the same opportunities we ourselves appreciate. The proposed rule enables us to do so, and to lead the way for others on the Atlantic Coast to do the same.
9/28/2026 18:20	Christine Gunshinan	New City	New York	For	Recreational bag limit 5 per day Atlantic Bonito Authority for the Div of Marine Fisheries Director to add measures with the consent prior by commission

Public Comments on MFC 2026-2027 Proposed Atlantic Bonito Rule
October 2, 2026

Created	Name	Address: City	Address: State	Are your comments for or against the proposed rulemaking?	Please enter your comments on proposed changes to the rules and cite the rule or rules on which you are commenting.
8/7/2026 7:21	Chuck Ward	Atlantic Beach	North Carolina	For	I have witnessed large numbers of bonitos being needlessly harvested per boat out at AR315 simply because they are easy targets. These boats often host less than 4 fishermen each. This fish does not freeze or preserve well, so many of these fish may be discarded and not consumed. A 5 fish per person creel limit is reasonable and necessary. Thank you.
8/26/2026 18:00:00	Cody Rubner			For	[Provided public comment at August 26, 2026 MFC hearing for proposed rule]
9/28/2026 14:19	Craig Cantelmo	Cutchogue	New York	For	"I frequently fish for Atlantic bonito in North Carolina and support the proposed five-fish recreational bag limit and the Director's proclamation authority with Commission consent. Bonito are currently unmanaged in North Carolina. This rule sets a sensible baseline and lets managers respond if the fishery changes. Please approve it."
8/3/2026 13:07	Curt Bell	Oak Island	North Carolina	Undecided	In reference to the proposed Atlantic Bonito harvest limits. As long as commercial fisherman are allowed to pull nets in and around inland waters killing millions of fish belonging to all citizens and taxpayers of NC while making millions of dollars exploiting that public resource I don't think any limits should be imposed on recreational fisherman.
8/29/2026 21:21	Dan Ruede	Watervleit	New York	For	I am for setting a five-fish recreational bag limit for Atlantic bonito. Thank you for your time, and thank you for considering taking the necessary steps to give our oceans and fisheries the best possible chance they can have.
10/1/2026 12:22	Danielle Mcaree	Ocean Springs	Mississippi	For	
8/26/2026 18:00:00	Eddie Nickens			For	[Provided public comment at August 26, 2026 MFC hearing for proposed rule]
10/1/2026 14:20	Edward Pacheco	Virginia Beach	Virginia	For	There should be limit on Atlantic Bonita all along North Carolina and all the US eastern shore line.

Public Comments on MFC 2026-2027 Proposed Atlantic Bonito Rule
October 2, 2026

Created	Name	Address: City	Address: State	Are your comments for or against the proposed rulemaking?	Please enter your comments on proposed changes to the rules and cite the rule or rules on which you are commenting.
8/5/2026 7:34	Glenn Anderson	Bunnlevel	North Carolina	Against	Really?? Another restriction for the weekend fisherman? I don't keep bonito, but that's not the point. The Atlantic bonito is not endangered. In fact, according to the International Union for Conservation of Nature (IUCN), the Atlantic Bonito is way down at the bottom of their list, number 7 of 7 assessed categories, and that category is named Least Concerned (LC). A "Least Concern" species is a species that has had their population status fully evaluated and categorized by the IUCN as not being a focus of wildlife conservation because the specific species is still plentiful in the wild. This new proposal of yours has nothing to do with conservation, but displaying your authority. Who harvests fisheries indiscriminately, the commercial or recreational fisherman? If you were truly interested in conservation of any fisherie, you petty tyrants would have done so decades ago, by putting severe restrictions on trawlers which rape the very marine ecosystem they travel through each and every trip. Maybe I'm wrong, but it seems the commercial fishery in general doesn't have as many restrictions as the recreational fisherman who only goes out a handful of times per year. The commercial fisheries measure their catch in metric tons, rather than a few pounds by the recreational fisherman who wants a few meals. My vote is absolutely NO, on this proposal. Glenn Anderson, Lifetime Sportsman License XXXXXXX
10/1/2026 12:04	Ian Devlin	Norwalk	Connecticut	For	I am for new protective regulation of Atlantic Bonito.
10/2/2026 10:34	Jack Sherman	Sneads Ferry	North Carolina	For	Highly advise making a limit for bonito. They are very difficult to freeze well. Lots of these fish are wasted each year.
8/7/2026 16:29	Jacob Presley	Dallas	North Carolina	For	I believe the fish limit is more than enough. These fish are usually not eaten just used as bait from my experiences. They provide a good sportfish and most not keeping them are catching them for sport rather than bycatch and using them as bait as the ones that keep them. The flounder rules are ridiculous though. So I am suspect if this just favors commercial fishermen in some way I don't know. I do know enough about the way the coastal fisheries mafia families operate when it's a fish they want to rape. But Bonito aren't one of those right?

Public Comments on MFC 2026-2027 Proposed Atlantic Bonito Rule
October 2, 2026

Created	Name	Address: City	Address: State	Are your comments for or against the proposed rulemaking?	Please enter your comments on proposed changes to the rules and cite the rule or rules on which you are commenting.
8/26/2026 18:00:00	Jake Hardy	Durham	Maine	For	[Provided public comment at August 26, 2026 MFC hearing for proposed rule]
10/2/2026 15:59	Jake Hardy	Durham	Maine	For	Subject: Support for proposed Atlantic bonito rule, 15A NCAC 03M .0524 Dear Members of the North Carolina Marine Fisheries Commission, I support proposed rule 15A NCAC 03M .0524: a recreational possession limit of five Atlantic bonito per person per day. I am commenting from out of state because I've loved my spring and fall trips to Hatteras and Cape Lookout. When the redfish and bluefish don't cooperate, bonito can save a fishing vacation. The landings are the reason to act now. From 1994 to 2024, North Carolina's recreational landings averaged about 16,500 fish a year. The preliminary 2025 estimate, through October, is about 96,000 fish, close to six times that average. The three highest years in the series are 2023, 2024, and 2025. That increase happened with no bag limit, no size limit, and no stock assessment. The Division's issue paper states that there is no biological evidence that the higher harvest of recent years is sustainable. It also reports that in 2023 and 2024 about 59 percent of the bonito harvested recreationally were smaller than the size at which half the fish are mature. A possession limit is the least the state can do until better information exists. Five fish costs anglers very little. The division's fiscal analysis found that most recreational trips land fewer than five bonito, because anyone who's tried to eat a frozen bonito knows they turn to mush. Adopting this rule would would help prevent the waste of a valuable resource. Thank you, Jake Hardy
8/28/2026 20:27	James E Adamo	Dafter	Michigan	For	High time to start protecting our unregulated fisheries. Thank you for taking action!

Public Comments on MFC 2026-2027 Proposed Atlantic Bonito Rule
October 2, 2026

Created	Name	Address: City	Address: State	Are your comments for or against the proposed rulemaking?	Please enter your comments on proposed changes to the rules and cite the rule or rules on which you are commenting.
9/29/2026 12:37	Jeanne Kispert	New York	New York	For	I support the proposed five-fish per person, per day recreational bag limit. This establishes a necessary, proactive baseline to ensure the long-term sustainability of the fishery amid rising recreational landings. I agree with granting the Division of Marine Fisheries Director the authority to implement additional measures, provided it strictly requires the Commission's prior consent. Any additional restrictions must remain data-driven, formally approved by the Commission, and paired with clear public outreach and a reasonable transition timeline before taking effect. Thank you for your dedication to managing North Carolina's marine fisheries and for considering these comments before the October 2, 2026, public comment deadline.

Public Comments on MFC 2026-2027 Proposed Atlantic Bonito Rule
October 2, 2026

Created	Name	Address: City	Address: State	Are your comments for or against the proposed rulemaking?	Please enter your comments on proposed changes to the rules and cite the rule or rules on which you are commenting.
9/28/2026 16:31	Jeannette Damitz	Staten Island	New York	For	I support establishing a five-fish daily recreational bag limit for Atlantic bonito in North Carolina. I also support giving the Division of Marine Fisheries Director the authority to implement additional management measures by proclamation with prior approval from the Marine Fisheries Commission. As recreational fishing pressure continues to increase, having a reasonable bag limit in place would provide a basic management framework for Atlantic bonito while still allowing anglers to enjoy the fishery. A five-fish limit seems like a practical starting point that would have little impact on most recreational anglers while helping prevent unnecessary increases in harvest. I also believe it is important for fisheries managers to have the ability to respond quickly if conditions change, rather than having to wait for a lengthy regulatory process. Establishing these measures now would give North Carolina a better foundation for managing the fishery responsibly in the future. Thank you for considering this comment and for your work managing North Carolina's marine fisheries.

Public Comments on MFC 2026-2027 Proposed Atlantic Bonito Rule
October 2, 2026

Created	Name	Address: City	Address: State	Are your comments for or against the proposed rulemaking?	Please enter your comments on proposed changes to the rules and cite the rule or rules on which you are commenting.
8/4/2026 12:28	Jefferson Rives	Charlotte	North Carolina	For	At the February meeting, Commissioner Hobgood observed that the Commission is too often reactive instead of proactive, and that protecting and preserving fish stocks is one of the Commission's core duties. I agree completely. Waiting for measurable decline before acting has been the pattern across too many North Carolina fisheries, and it has not served this state well. Bonito currently has no state bag limit. Establishing one now, while the stock is healthy, is precisely the precautionary management that prevents future crises instead of reacting to them after the fact. The proclamation authority in this rule matters just as much as the bag limit. It preserves the Division's ability to respond quickly to new information without a full rulemaking cycle each time conditions change. That adaptive capacity should be protected, not restricted. I urge the Commission to adopt this rule as proposed.
8/26/2026 18:00:00	John Mauser			For	[Provided public comment at August 26, 2026 MFC hearing for proposed rule]
8/5/2026 7:40	John McQuaid	Raleigh	North Carolina	For	I support limits on Bonito, and the other provisions of the rule. However, I don't think it goes far enough. I support a three fish per day limit. Bonito doesn't freeze well and I don't keep more that I can eat in one meal.
8/17/2026 0:00	Joseph J Francis		North Carolina	Against	[Online comment for August 2026 MFC business meeting:] Why should NC MFC or DMF have a roll in managing Atlantic Bonito as a migratory fish species with a brief stay along the NC Coast in the spring? It's not like either agency has a proven track record of properly managing our NC Fisheries over the last couple of decades or longer. Other than being poorly managed ! If any management is to be done on Atlantic Bonito it should be done as groups of states along the Southeast Atlantic and also the Northeast.
8/26/2026 14:43	Joseph Harris	Creedmoor	North Carolina	For	I just wanted to say that as a dedicated conservationist and an avid fisherman, I support limits for Atlantic Bonita. Thank you for the opportunity to voice an opinion.

Public Comments on MFC 2026-2027 Proposed Atlantic Bonito Rule
October 2, 2026

Created	Name	Address: City	Address: State	Are your comments for or against the proposed rulemaking?	Please enter your comments on proposed changes to the rules and cite the rule or rules on which you are commenting.
8/26/2026 18:00:00	Joseph Harris	Creedmoor	North Carolina	For	[Provided public comment at August 26, 2026 MFC hearing for proposed rule]
8/26/2026 13:29	Joseph McClure	Spartanburg	South Carolina	For	Pass the bonito limits!
10/1/2026 12:11	Justin Kim	Biloxi	Mississippi	For	I am commenting on proposed rule 15A NCAC 03M .0524, and I believe that this is a good change to ensure the health of the Sarda sarda stock which is a valuable recreational fishery and also previously had no regulations.
9/29/2026 20:48	Justin William Ragsdale	Newport	North Carolina	For	Five per person is more than enough. I would add: No captain mate limits allowed on charter. Max boat limit of 20.
8/28/2026 15:54	Keith Goodman	Naples	Florida	For	These fish are critical links in the chain of our oceans. They are too often overlooked in management practices and deserve significant management action. Please enact these new rules for the future of our kids kids ability to enjoy the resources we know and have too often come to take for granted.
10/1/2026 14:13	Ken Eiler	Beaufort	North Carolina	For	I have been a salt water fly fisherman for 25 years The Bonita is a great fish for both catching and eating Please protect them!
8/16/2026 17:12	Kevin Zyvoloski	Raleigh	North Carolina	For	I support this change.
10/2/2026 14:54	Kitri Schaefer	York	Maine	For	I am an angler up and down the east coast. I care about the health of our fisheries and support the proposed five-fish recreational bag limit and the Director's proclamation authority with Commission consent. Bonito are currently unmanaged in North Carolina. This rule sets a sensible baseline and lets managers respond if the fishery changes. Please approve it.
10/1/2026 19:16	Kyle Chanitz	Boones Mill	Virginia	For	With 5 bonito a day per anger it is more than a fair regulation
8/25/2026 12:24	Kyle Schaefer	York	Maine	For	With Atlantic Bonito increasing in both harvest and importance to anglers I support instating the 5 fish per day limit on Bonito. This common sense measure will help to ensure that this fishery is enjoyed for the long haul rather than exploited by few in the short term. Thank you for the time and for your proactive approach to fisheries management! Abundance for all is the dream. Best, Kyle Schaefer

Public Comments on MFC 2026-2027 Proposed Atlantic Bonito Rule
October 2, 2026

Created	Name	Address: City	Address: State	Are your comments for or against the proposed rulemaking?	Please enter your comments on proposed changes to the rules and cite the rule or rules on which you are commenting.
8/26/2026 18:00:00	Kyle Schaefer	York	Maine	For	[Provided public comment at August 26, 2026 MFC hearing for proposed rule]
10/2/2026 11:15	Kyle Schaefer	York	Maine	For	I fish for Atlantic Bonito on the east coast of the US in multiple states and I strongly support the proposition of the 5-fish rec bag limit and the Dirctor's Proclamtion Authority with Commission consent. Bonito are currently unmanaged and this fish deserves to be conseved and managed in a manner that will allow anglers to fish for them for years, and decades to come. We want to avoid overharvest by a subculture of folks that are removing dozens and dozens per day and most fish don't even end up getting eaten. This rule proposes a sensible baseline for management and protects against extreme overharvest. Thanks!
8/7/2026 7:16	Kyle van Althuis	Leland	North Carolina	Against	This a perfect example of government overreach. You feel you have a resource problem but have no real scientific data to support your feelings. Responsible institutions with the mandate of managing natural resources make scientific inquiries, gather data, and then propose informed regulations. Stop, study, and then come back and revisit this. These fish belong to the entire public of NC, not just the ones with boats. I [one of the few with a boat] should be able to share an abundant resource with my friends and family [the ones without a boat], on the very few days I'm able to target these fish during their brief visit to our coast.
8/3/2026 20:25	Mac Currin	Washington	North Carolina	For	I support setting a bag limit on bonito as well as adaptive management that might allow further restrictions if warranted and approved by the MFC. Thank you for proactively managing a previously unmanaged species.

Public Comments on MFC 2026-2027 Proposed Atlantic Bonito Rule
October 2, 2026

Created	Name	Address: City	Address: State	Are your comments for or against the proposed rulemaking?	Please enter your comments on proposed changes to the rules and cite the rule or rules on which you are commenting.
10/1/2026 12:04	Madison Dunigan	Port St. Joe	Florida	For	There needs to be regulation such as a 5 fish limit per angler on Atlantic Bonita. These are an important species of fish and putting protections in place so that their populations can continue to thrive and anglers can continue to enjoy them should be a priority.
8/26/2026 17:05	Mario Campo	Madisonville	Louisiana	For	Re: Support for Proposed Atlantic Bonito Bag Limit (15A NCAC 03M .0524) Members of the North Carolina Marine Fisheries Commission and Division of Marine Fisheries Staff, Immense gratitude is extended to the Division of Marine Fisheries and the Marine Fisheries Commission for the consideration of novel fisheries management actions regarding Atlantic Bonito. This comment serves to document strong support for the proposed management action that would establish a five-fish recreational bag limit per person, per day - along with the technical ability for the Fisheries Director to implement additional measures by proclamation pursuant to 15A NCAC 03H .0103 and prior consent of the Marine Fisheries Commission. Atlantic Bonito can widely be considered a data poor species, particularly in North Carolina, where a large knowledge gap exists and stock status is considered practically unknown. It is pertinent that proactive management takes priority status rather than delay for a formal stock assessment considering targeted trips, and recreational harvest of Atlantic Bonito in North Carolina waters have increased. Despite increased harvest, a creel limit of five fish should not immediately place a negative utility on anglers considering the implementation of the proposed management action regulating harvest to five Atlantic Bonito per person per day can be considered quite modest, thus not limiting public access. In closing, thank you to the Division of Marine Fisheries Staff, along with the North Carolina Marine Fisheries Commission to consider active management action for an increasingly popular species, that little scientific information is known of. Implementation of this action will allow for active management of a valuable species, while laying the groundwork for future formal stock assessments, and ultimately promoting a resilient future for the Atlantic Bonito fishery. Thank you for your continued work on behalf of North Carolina's marine resources. Respectfully, Frank Mario Campo

Public Comments on MFC 2026-2027 Proposed Atlantic Bonito Rule
October 2, 2026

Created	Name	Address: City	Address: State	Are your comments for or against the proposed rulemaking?	Please enter your comments on proposed changes to the rules and cite the rule or rules on which you are commenting.
8/26/2026 18:00:00	Mario Campo	Madisonville	Louisiana	For	[Provided public comment at August 26, 2026 MFC hearing for proposed rule]
10/2/2026 12:14	Mario Campo	Madisonville	Louisiana	For	Re: Support for Proposed Rule Setting a Five-Fish Recreational Bag Limit for Atlantic Bonito and Related Management Authority Dear Members of the North Carolina Marine Fisheries Commission, I write in strong support of the proposed rule establishing a five-fish recreational bag limit for Atlantic bonito (Sarda sarda) and authorizing the Division of Marine Fisheries Director to implement additional management measures by proclamation, subject to the Commission's prior consent. This is a measured, science-informed, and overdue step toward responsible stewardship of a shared coastal resource. Currently, North Carolina has no bag or size limits and no formal management framework for Atlantic bonito. Recreational landings have risen in recent years, and the state accounts for a meaningful share of the coastwide harvest. Leaving a popular and increasingly targeted species entirely unregulated is inconsistent with the principles of precautionary and adaptive fisheries management. Experience along the Atlantic coast has repeatedly shown that waiting for a comprehensive stock assessment before acting can allow fishing mortality to rise unchecked, increasing the risk of localized depletion and longer recovery times once a decline becomes evident. The proposed five-fish limit is appropriately modest. Available information indicates that most recreational trips do not currently retain this number of fish; therefore, the immediate reduction in harvest is expected to be limited. At the same time, the rule establishes a clear, enforceable baseline and provides a durable management tool. The accompanying authority for the Director to implement additional measures by proclamation, with prior Commission consent, provides the flexibility managers need to respond to changing conditions without unnecessary delay. This combination of a defined starting point and adaptive capacity represents sound policy. North Carolina's action would also complement existing measures in Massachusetts for bonito and false albacore. Coordinated state-level steps help protect a migratory resource that does not recognize jurisdictional boundaries. Proactive management is preferable to reactive measures taken only after clear evidence of decline. I urge the Commission to adopt the proposed rule. Doing so demonstrates a commitment to sustainable recreational fisheries, aligns with the precautionary approach embedded in modern fisheries policy, and helps ensure that Atlantic bonito remain available to future generations of anglers and coastal communities. Thank you for the opportunity to comment and for your continued attention to the responsible management of North Carolina's marine resources. Respectfully, Mario Campo Deputy Director of Fisheries Science and Policy American Saltwater Guides Association
10/1/2026 13:23	Matt Bynum	Colorado Springs	Colorado	For	I am for the proposal to limit the take of Atlantic Bonito. I believe they are an important species that need protection.

Public Comments on MFC 2026-2027 Proposed Atlantic Bonito Rule
October 2, 2026

Created	Name	Address: City	Address: State	Are your comments for or against the proposed rulemaking?	Please enter your comments on proposed changes to the rules and cite the rule or rules on which you are commenting.
8/4/2026 4:04	Matt Torcasso	Durham	North Carolina	For	After doing some research, I am for a daily bag limit on Bonito to protect the fish from being harvested irresponsibly.
10/1/2026 12:23	Matt Virden	Ocean Springs	Mississippi	For	
8/26/2026 18:00:00	Michael Ellison			Against	[Provided public comment at August 26, 2026 MFC hearing for proposed rule]
10/1/2026 12:41	Mike Cartechine	Boston	New York	For	For limiting the number of Atlantic Bonita
10/1/2026 19:14	Morgan Wilson	Buchanan	Virginia	For	
10/1/2026 12:23	Nate McGregor	Ocean Springs	Mississippi	For	
8/25/2026 17:44	Newman Weaver	Georgetown	South Carolina	For	
10/1/2026 12:18	Olivia Gathright	Biloxi	Mississippi	For	I like bonito
8/28/2026 16:50	PARKER MAUCK	WESTPORT POINT	Massachusetts	For	I am a saltwater guide located in Westport, Massachusetts. The entire east coast of the U.S. shares the False Albacore and Atlantic Bonito resource. As such we all have a role and a responsibility to respect the species that inhabit our own state waters as well as the waters of other states. I support conservation measures to protect False Albacore and Atlantic Bonito. Thank you for the opportunity to comment.
10/1/2026 17:35	Patrick Robinson	Middlefield	Ohio	For	It's definitely time for these fish to have some kind of regulation to ensure these fish have healthy populations for the future. Thanks for taking the time to hear from the public!
8/4/2026 14:34	Pembroke Nash	Kernersville	North Carolina	For	I agree that Atlantic bonito need protection and a 5 fish per person bag limit is fair to fishermen and will protect the stock. These are an incredible seasonal target that should be managed for abundance, not maximum extraction.
8/7/2026 8:14	Pete Boelte	Wilmington	North Carolina	For	We should be proactive and regulating the take of Atlantic Bonito so that we do not have to end up with draconian restrictions like we have had to do with southern flounder because of the mismanagement of the fishery
8/26/2026 18:00:00	Ray Jarvis			For	[Provided public comment at August 26, 2026 MFC hearing for proposed rule]
10/1/2026 12:18	Ray Paull	Biloxi	Mississippi	For	

Public Comments on MFC 2026-2027 Proposed Atlantic Bonito Rule
October 2, 2026

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8/31/2026 9:59	Richard Beare	Clayton	North Carolina	For	this action makes sense to protect the species before the need arises. Given the lack of positive management results to protect the various species over the decades. My hope is this proposal puts in place a trigger instead of a reactionary response after the stock is in destress.
10/1/2026 18:34	Richard Formato	Wytheville	Virginia	For	We come fish every season - for 30 years - there needs to be a limit.
8/26/2026 20:51	Roger Davis	Columbia	South Carolina	For	I support the proposal for a bag limit of 5 for the Atlantic bonito. Thank you
8/26/2026 7:45	Sam Boyce	Wilmington	North Carolina	For	I appreciate MFC taking a proactive approach to managing this fishery. 5 Atlantic Bonito is a good starting point. As we learn more about the fishery status, you will be able to adjust as needed.
8/25/2026 9:31	Scott Davis	Charleston	South Carolina	For	As a retired fishing guide and fishing store owner in SC, the amount of anglers that headed to coastal North Carolina yearly was staggering. The economic impact that a fishery creates cannot be denied and these fish are important to the guides, shops, marinas, lure makers, restaurants etc that rely on their seasonal presence. I am absolutely for imposing a limit on bonito. 5 fish is a liberal bag limit for a fish that notoriously doesn't freeze well. As we all know there is percentage of people that will catch and kill everything you allow them too; with a fish that arrives in such big numbers (like Albies and Bonito) their protection becomes important as fishing pressure continues to grow. They are too valuable to become garden fertilizer or crab bait due to a simple lack of freezer space. Thank you sincerely to the members of the Marine Fisheries Commission and the Division of Marine Fisheries staff for considering such important regulations.
8/26/2026 18:00:00	Scott Davis	Charleston	South Carolina	For	[Provided public comment at August 26, 2026 MFC hearing for proposed rule]

Public Comments on MFC 2026-2027 Proposed Atlantic Bonito Rule
October 2, 2026

Created	Name	Address: City	Address: State	Are your comments for or against the proposed rulemaking?	Please enter your comments on proposed changes to the rules and cite the rule or rules on which you are commenting.
10/1/2026 15:29	Sean Cosgrove	Washington, DC	District of Columbia	For	I support the rulemaking to create a five fish recreational fishing limit for Atlantic bonito. Recreational landings have been rising, and North Carolina accounts for a meaningful portion of the coastwide harvest. Leaving a popular and increasingly targeted species completely unregulated is not sustainable management. The proposed five-fish limit is modest. The immediate impact on harvest will be limited. At the same time, the rule creates a permanent baseline and gives managers a tool to respond if conditions change. That combination of a clear starting point and the ability to act quickly is the kind of common sense approach we need more of along the Atlantic coast. A five fish limit for Atlantic bonito presents a solid management solution for now and the future
10/1/2026 16:01	Sean Cosgrove	Washington, DC	District of Columbia	For	This comment pertains to the adoption of the proposed Atlantic Bonito Management Rule. Recreational landings have been rising, and North Carolina accounts for a meaningful portion of the coastwide harvest. Leaving a popular and increasingly targeted species completely unregulated is not sustainable management. The proposed five-fish limit is modest. The immediate impact on harvest will be limited. At the same time, the rule creates a permanent baseline and gives managers a tool to respond if conditions change. That combination of a clear starting point and the ability to act quickly is the kind of common sense approach we need more of along the Atlantic coast. Thank you for the ability to offer this comment. Sincerely, Sean Cosgrove Washington, DC

Public Comments on MFC 2026-2027 Proposed Atlantic Bonito Rule
October 2, 2026

Created	Name	Address: City	Address: State	Are your comments for or against the proposed rulemaking?	Please enter your comments on proposed changes to the rules and cite the rule or rules on which you are commenting.
9/30/2026 17:17	Sheldon Batsavage	Morehead City	North Carolina	For	i support the proposed rule for Atlantic bonito. I think that five fish is enough for recreational anglers because they do not taste good and do not freeze well and i would like to see them around for a long time.
10/1/2026 20:45	Spencer Young	Lynchburg	Virginia	For	The fish need protection and limits to maintain a sustainable fishery.
10/1/2026 13:33	Stewart Gordon	Newport	North Carolina	For	I support the bag limit for Atlantic bonito. This fishery must be managed and maintained. Thank you.
9/29/2026 8:04	Susan Bertoline	Floral Park	New York	For	I support a five fish daily bag limit for Atlantic bonito in North Carolina. With a lot of fishing stocks in deep trouble these fish are being targeted more often and need precautionary protection. In addition, I support approving authority to the Div of Marine Fisheries Director to add management measures by proclamation, with the Commission's prior consent. This will allow a quicker response, if needed. North Carolina has a great fishery that they should protect for their residents and those that travel there for the fishing opportunities. Thank you for your consideration, Sue
8/26/2026 18:00:00	Tony Friedrich	Grasonville	Maryland	For	[Provided public comment at August 26, 2026 MFC hearing for proposed rule]

Public Comments on MFC 2026-2027 Proposed Atlantic Bonito Rule
October 2, 2026

Created	Name	Address: City	Address: State	Are your comments for or against the proposed rulemaking?	Please enter your comments on proposed changes to the rules and cite the rule or rules on which you are commenting.
10/2/2026 12:45	Tony Friedrich	Grasonville	Maryland	For	Subject: Support for proposed Atlantic bonito recreational bag limit, 15A NCAC 03M .0524 The American Saltwater Guides Association supports the Marine Fisheries Commission's proposed five-fish recreational bag limit for Atlantic bonito, and we support giving the Division of Marine Fisheries Director proclamation authority to add time, area, season, size, and method measures with the Commission's prior consent. Thank you to the Division and the Commission for moving this. North Carolina has no bag limit, no size limit, and no management framework for Atlantic bonito. Putting a real possession limit in rule, before this fish is in the same shape as the stocks already in trouble, is the right use of the Commission's time. The staff work to get a fiscal analysis and a notice of text in front of the public was greatly appreciated. Five fish is enough. A limit of five matches what Massachusetts already did and what anglers can actually use. Atlantic bonito is an outstanding fish to eat the day it is caught. It does not freeze well, and it does not hold in a cooler the way a flounder or a black sea bass does. Past a couple of fish per person, the rest is waste. Leaving the recreational fishery unlimited has meant coolers of 40 and 50 fish on a good day, for a species with no assessment and no size limit. That is not a fishery; it is wanton waste. If people didn't behave badly, we wouldn't have to do this. It is also the wrong time to leave any coastal fish unmanaged. Southern flounder, spotted seatrout, and striped bass are already carrying reductions, closures, or failed year classes. Bonito should not be the fish people turn to when everything else is tight, with no ceiling on the kill. A five-fish bag does not close the season. It stops the waste and gives the Division a tool if the fishery changes. Please adopt the five-fish recreational limit as proposed, and keep the Director's proclamation authority tied to prior Commission consent. We will support this rule at final action in November. Tony Friedrich Policy Director American Saltwater Guides Association

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8/4/2026 9:46	Will Anders	Raleigh	North Carolina	For	I think this rule is long overdue and if anything may not be restrictive enough. These are fish that are only here for a short time so we need to do our part not to over harvest during the short time they're here, and they also don't really freeze so nobody should need any more than this (or even this much). Given the long term failures of conservation and the public displays of lack of respect for the fishery health (just check instagram), I would much rather see a strong regulation in place now so that we don't lose yet another resource like has happened with flounder, spot, gray trout, etc.
8/4/2026 17:55	Will Brown	Wilmington	North Carolina	Against	I'm 50 years old and I have been saltwater fishing in NC for my entire life. New regulations on a previously unregulated species concerns me. Do we actually know anything about Atlantic Bonito: stock viability, maturity age, distribution, angling pressure? Is there a stock assessment, and if so how credible is it given this is a highly migratory ocean going species? I'm worried that the fishing public of NC is getting more and more rules that are not based on any scientific study. The state should not be in the business of regulating every species that swims in its waters. The state should not be implementing arbitrary rules just because there are not any current regulations for a given species.
10/2/2026 11:44	William Coffey	Boone	North Carolina	For	

Public Comments on MFC 2026-2027 Proposed Atlantic Bonito Rule
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8/4/2026 7:36	William Phillip Loughlin	Pink Hill	North Carolina	Against	In regard to proposed limits on the take of Atlantic bonito: I do recognize that some fishermen are taking too much liberty with the fishery (some of these guys literally fill their boats), but I believe going from no limit to five fish seems a bit restrictive, especially considering the Atlantic bonito are only in our area for a short time each season. I would, however, support a more liberal limit, as I think it's a good idea to curb the excesses. Maybe 10-12 fish per person (similar to Spanish mackerel) is a better solution. After reading the proposed rule and reasoning, I don't see anything there to suggest the population is quantifiably impacted. Where is the actual science here? Less than 1/4 of all total landings occur in NC. Using similar anecdotal evidence, I would argue that the catch has consistently increased in the past 10 years as evidence that the Atlantic bonito are actually doing quite well. These fish grow rapidly and reproduce prolifically. Basing the limit on the suggestion that Atlantic bonito don't keep well in the freezer is ridiculously subjective and unscientific. To summarize, I agree that currently increasing and unrestricted take of the Atlantic bonito is probably not sustainable, but there is no evidence to support a strict limit of five fish per day. Give the commission power to regulate, but limit that regulation to evidence-based criteria. Set a more liberal limit (10-12 per person) to increase buy-in from the recreational fishermen, and then apply science to determine if more or less regulation is required to protect the fishery.

N.C. Marine Fisheries Commission
August 2026 Quarterly Business Meeting
Written Public Comment

Name	**State/Province**	**Please type your comments in the box below.**
Joseph J Francis	North Carolina	Why should NC MFC or DMF have a roll in managing Atlantic Bonito as a migratory fish species with a brief stay along the NC Coast in the spring? It's not like either agency has a proven track record of properly managing our NC Fisheries over the last couple of decades or longer. Other than being poorly managed ! If any management is to be done on Atlantic Bonito it should be done as groups of states along the Southeast Atlantic and also the Northeast.
Bennie L Braswell	North Carolina	I agree with the limit on Bonito. But not the overall policies currently in place Apparently regulations implemented over many years have not had positive outcome, with exception of redfish stocks. North Carolina has 2 regulatory agencies that do not work together. N. C. Division of Marine Fisheries has provides recommendations from scientific studies that are mostly ignored by the N. C. Marine Fisheries Commission that makes the regulations. I'm sincerely disappointed to see regulations dictated so biased in favor of big commercial entities. This mismanagement arrangement has produced regulations with a distinct bias in favor of commercial fisheries, at the expense of the recreational fishermen and N.C. General Public. 1. Recreational fisherman have bycatch counted against their quota of harvested fish. 2. Commercial fisheries bycatch is not counted against their quota of harvested fish. 3. I read deeply into the commercial regulations that stated harvested catch sold outside of the state do not count against their quota. 4. NC is the only state on the east coast that allows trawling and gill netting in our inshore waters. Other states have recognized that this practice destroys the emerging young fishes and fish biomass, fish stocks do not recover due to this practice. 5. Rockfish are not allowed to be harvested by recreational fishermen for the last 3 years in my area. 6. Flounder are now not allowed to be harvested by recreational fishermen after several years of reductions. Commercial harvesting continues. 7. Speckled trout are now being overfished. Reductions in harvesting are starting with commercial bias being proposed. Going back 20 years or so, people fishing the lower Neuse River, Pamlico Sound were able to catch plenty of fish species. Spot, Croaker, Grey Trout, Striped Bass and other species. These areas are now void of bottom fishes worth catching, Striped Bass, Flounder, are not allowed to be harvested by recreational fishing. Grey Trout, one per day. Now Speckled trout are technically being overharvested. I am reminded of the definition of insanity, and plead with you as my representative to discontinue allowing mismanagement of our fisheries in this manner. The inland commercial trawling and gill netting will continue to deplete our states fisheries for everyone. Including themselves!

MARINE FISHERIES COMMISSION
SUMMARY OF PUBLIC HEARING FOR PROPOSED RULES

DIVISION OF MARINE FISHERIES
CENTRAL DISTRICT OFFICE, MOREHEAD CITY, N.C.
AND VIA WEBEX
AUGUST 26, 2026, 6 P.M.

Marine Fisheries Commission:	A Hobgood (online)
Division of Marine Fisheries Staff:	Chris Batsavage (online), Makenna Beehler, Catherine Blum (online), Lynn Ewart, Brian Gupton, Eddie Mann, Tina Moore, Lucas Pensinger, McLean Seward (online), Savannah Starling (online), Hope Wade
Public:	Sue Bertoline, Mario Campo, Blane Chocklett, Scott Davis, Michael Ellison (in person), Tony Friedrich, Jake Hardy, Joseph Harris, Ray Jarvis, John Mauser, Eddie Nickens, Cody Rubner, Kyle Schaefer
Media:	None

Marine Fisheries Commission (MFC) member A Hobgood, serving as the hearing officer, opened the public hearing for MFC proposed rules at 6 p.m. The MFC proposed one rule for adoption. Public comments on the proposed rule are scheduled to be presented to the MFC at its November 2026 business meeting prior to its vote on final approval of the rule. The proposed effective date of the rule will be determined by the legislative review process no earlier than the 2027 legislative session, as the rule is automatically subject to legislative review. The hearing was a formal process to receive public comments only about the proposed rule as published in the *N.C. Register*.

The reason for proposed action for this rule was published in Volume 41, Issue 03 of the *N.C. Register*. The comment period for this rule ended at 5 p.m. October 2, 2026. The public could submit comments via U.S. mail to the Division of Marine Fisheries, P.O. Box 769, Morehead City, NC 28557; written comments could also be submitted via an online form available on the Division of Marine Fisheries website, on the "2026-2027" proposed rules webpage.

Commissioner Hobgood opened the floor for the public to provide comments.

Tony Friedrich: "Can you all hear me ok? Not coming through? Okay, thank you so much. Okay. I'd like to thank the state agency, everyone who worked on this. It means a lot to us. My name is Tony Friedrich. I'm the president of the American Salt Water Guides Association. We, first first things first, we are doing a little bit of science on bonito. We did a lot of science on albies. We were able to tag about two dozen last year in North Carolina to get an idea on their movements, you know, and, and who knows what you find out when you put a telemetry tag in the fish. So, we we are deploying more in New England, and there are a lot of, you know, middle middle-sized to good-sized bonito around. There was clearly a good spawn and they've proven to be a fish that our, the clients of our guides, love to target. This five fish rule is gonna be incredibly beneficial to the state of North Carolina. If you have six people on a boat, you can take home 30 bonito still, but you're not gonna waste them. I think we've all seen the pictures, and I think that's all, we all know kind of why we're here, that there was a little a little bit of excessive harvest going on with a fish that you really can't freeze and you really can't save. And we want these fish around for our

guides and for recreational anglers this year and next year, the year after that. Hopefully we'll get a great spawn and hopefully everyone will be able to enjoy them. And again, we just like to thank the state of North Carolina for going through this process and putting common sense rules in place that'll benefit everyone in the long term. So, thank you again for all your hard work. We appreciate it and thank you for letting us comment tonight."

Scott Davis: "How's everybody? Can you hear me? Can you hear me ok? Okay, great. I think Tony sold my notes. He pretty much hammered my sentiments exact. I'm from Charleston, South Carolina, I'm a guide and a shop owner, and I'm the South Carolina representative for the Salt Water Guide's Association. Just to echo him, I'll be really brief. I think the five fish limit is is needed as a very good step towards towards everything. We need conservation and and more fish in the water. So that's all. I appreciate you letting me comment."

Cody Rubner: "Hello, can you all hear me? Awesome. Thank you. My name's Captain Cody Rubner. I'm gonna keep things short and sweet as well as I'm sure you guys have a bunch of meetings that go far too long and will try not to contribute to one of those tonight. Like but I fully support the five fish bag limit for bonito. Just you know keeping everything short and sweet and focus on common sense, the reality is that five fish per person especially like previous speakers said multiple anglers in a boat, it's a lot of fish that comes home. The last time that I actually got to target bonito was with my nephew and it's a memory I hold dearly. We were up off Cape Cod, obviously migratory fish in the same fish even though outside of North Carolina waters, we kept a handful for the family and it was more than enough, and that would have been less than just a single person's bag limit within this context, so fully support this. I've grown up around fisheries that were on their way back after at the reaching the brink and now they're on their way back down to the brink. And so, watching fisheries go up and go down and reality is a lot more going down than they are going up right now. So anytime we have an opportunity like this to lay a foundation that says, hey, why don't we just only take so much and just keep enjoying it and be able to enjoy it for a really long time. I think it's pure common sense. So, like I said I'll keep everything short and sweet, thank you for the opportunity to comment."

Mario Campo: "Hey, good afternoon, everybody. My name is Mario Campo. I'm from South Louisiana, but I've been following this closely. I'm also with the American Saltwater Guides Association. I'll keep this short and sweet as well. I strongly support the proposed management action, especially considering that I think Bonito is a data poor species in itself, and you know a large knowledge gap exists for the species, I think that these proactive management measures is pertinent especially for future management for this species. So, so, I would like to thank, I'd like to thank North Carolina's Marine Resources for their continued hard work on behalf of these resources, and and thank you. That's all."

Jake Hardy: "Hi, my name's Jake Hardy. I'd like to thank, thank you like everyone else here. I, I am from Maine, well living in Maine now, from Massachusetts and New York and also with ASGA (American Saltwater Guides Association). And like everyone else here, and a lot of recreational anglers, I've become a big fan of bonito especially as other species that we rely on decline. They're a blast on light tackle and I'll add that they really are delicious seared fresh, and five fish bag limit is more than reasonable for any honest angler. I've watched coolers get filled well past what any family can eat and without a bag limit, that kind of waste is just baked into this fishery. So, yeah, to keep it short and sweet, I just want to highlight the DMF's main source of information for this is annual landings and that can't tell you whether there's more fish out there or just more fish or more anglers targeting and catching them. So, whatever's driving the recent spike, none of us can really say for sure and that uncertainty is the argument for this rule, not a reason to delay or wait. So, thank you for your time."

Kyle Schaefer: "Oh, well, well thank you. I, I appreciate the the time. I do not have constraints I didn't I didn't I thought that was kind of the way to signal I'm here to to comment. So I don't mean to jump

anybody, but here I go. I am, my name's Kyle Schaefer. I've been a longtime fishing guide up here in New England. I'm also a lodge owner, down in the Bahamas as well and been in this fishing industry my, my whole life. And just want to thank you guys for the opportunity to comment here. I think this is a, a fantastic, proposal with the five fish bag limit. It makes a ton of sense for anglers that want to catch and release. And, and anglers that want to catch and and take home and, and have some some wonderful fish for their family. I think coming from the the New England perspective, it's really cool to see states in the south even proposing measures like this because I think it just, you know, I see it as a way to kind of de-risk our future fishing up here in New England as well. I think it really, you know, being a migratory stock, things that are happening in the Southeast are, you know, heavily affect this up here in New England and so it's, it's great to see you guys taking a proactive approach here and just want to thank you for the time and clearly say I'm in support of the measure, so thank you guys."

Michael Ellison: "Well, I have a different perspective, I've been in the ecosystem restoration business for 30 years. I've been a division director at, at DENR/DEQ. I've been executive director of the Louisiana Coastal Protection and Restoration Authority, the natural resources trustee from the state of North Carolina delegated authority, and I currently serve on the Environmental Management Commission. I am representing myself. I just wanted to give you an idea of where my perspective comes from. I don't know why you need to regulate. The the data do not support because you don't have enough data. There's no targeted commercial fishery. There's no biological concern. No valid data compel regulations. I don't think that Massachusetts, North Turkey are, are, provide models for intelligent regulation at North Carolina. You have no concerns about commercial fishing impacts. And perhaps recreational landings may have apparently possibly increased because so many other fisheries are so strictly regulated. I think the delegation of the commission's authority to the division director, I believe that's an abdication of your responsibilities, with all due respect, the commission is charged with passing rules. The rule making process is deliberative, extensive, detailed, and it takes time and when the legislature prescribed the rule making process that commissioners go through, they did it intentionally so that rules would not be rushed through. And yet in awarding the director proclamation authority to change the rule, you remove the opportunity for public comment, you remove the requirement for regulatory impact and net assessment and fiscal analysis. And it, the the director should, cannot be as easily removed from their position. They do not have the accountability that you as a commissioner have, either directly or indirectly. You're, you're appointed by a political officer who is voted into office by the public, and you have a limit on your term. State employees are much more secure in their positions. So I, I don't believe that the proclamation authority is a good idea. But I think it bypasses a critically important process set forth in statute. Your fiscal analysis having read countless dozens of fiscal notes and and RIAs, it seems kind of bogus. Your in, your your data indicate, they don't demonstrate, they indicate that most recreational trips keep less than five fish. There's no targeted commercial fishery, so if you're, if the recreational fishers are not keeping more than five fish, I don't know why you need to set a rule of five fish and set everything up for a rapid reduction in that limit. Like I said, the data, data do not support the need for for regulation. The fiscal note states that you cannot reliably estimate the magnitude of the changes proposed today or changes that might be established by proclamation in the future. That's not a fiscal analysis. You don't know how many people, if, if by proclamation the limit goes down to two fish and all the other limits that the commission in many cases rightly and in some cases questionably, but all the other limits people might just not fish as much because it's not as much fun. So, I guess like I said, I , I, I don't think, it seems like you're regulating just to regulate, and I understand the idea of being proactive and in many cases that's warranted, but if there's not a problem, setting up a division director by proclamation to make major changes in a recreational fishery, I, I just don't think that's a good idea. Thank you."

Blane Chocklett: "Yes, can you hear me? Okay am. Okay, as you said, my name's Blaine Chocklett, and I've been in the fishing industry for 35 years. I'm an ambassador for a lot of brands in the outdoor and fishing industry, including Yeti, Patagonia, Posta sunglasses. And part of my role as an ambassador for them, is conservation, right? And part of what I do, being a guide for 35 years, I have quite a few clients

that I'll take and post trips all over the world, including the state of North Carolina, which I've been doing since 1998. And a lot of what happens with me as a host to, to take clients to fisheries is how well those fisheries do for my anglers and what the abundance of fish, right? And I have a unique perspective on this because I've traveled to Cape Cod, I've seen bonito up there, seen bonito in North Carolina. And a lot of my trips have changed over the years because many fisheries are not as good as they used to be, whether it's overfishing, water quality, whatever it may be, and certain things, whether it's environmental, a lot of things we can't control, but what we can control is fish regulations and making it right for everyone. And I, I do really appreciate the fact that North Carolina is being proactive on trying to regulate bonito because I do feel like the world's getting smaller, you know, fisheries are on the decline for the most part and selfishly for me as an angler and as a host, to show people the different great areas in North Carolina. I've been all over the world and North Carolina is one of my favorite places to go. And Atlantic bonito, just like false albacore, did not have regulations on them, and the fact that you are being proactive on this, I really love that fact because I think these fish are such a great fish and the fact that there isn't any regulations on them. I think it's very important to be proactive on that and for the future of the guides that work on them daily when they're in season and when they come inshore, but also for the future, for my son I have a 10 year old son that loves to fish and I want him to be able to see healthy fisheries in the future. And for me, I just want to say thank you for bringing this up and I appreciate your time, so I'm in favor of it. Thank you."

Ray Jarvis: "Yep, can you hear me? Sorry I was muted there. Great. Yeah, thanks for your time. I appreciate North Carolina proposing these rules and I'm definitely in favor of the five fish. I live in Massachusetts. I'm a fishing guide up here. I also worked with the American Saltwater Guides Association and being up here in Massachusetts, we enacted proactive measures on false albacore and bonito. You know, because we kind of rely on those species up here, especially myself as a guide and in the face of a declining striped bass population, you know, taking proactive measures is the exact reason, you know, why we have fish kind of, you know, for the in the future, I want my son to be able to catch fish and you know, being proactive about all this stuff is definitely, you know, a light and a dark tunnel. I think that we've seen plenty of different fisheries come back and decline and, you know, without the lack of science or data behind the species by, you know, being proactive, it's the exact reason why we should be arguing that there is no science or data to do this is the exact reason why we should be doing it because rather than waiting for a problem, we're kind of nipping it in the bud here. So, sorry for my confused thoughts there, but I appreciate you taking the steps to implement the five fish measure and, I'm in support of it, so thank you for your time."

Eddie Nickens: "Hey there. Can you hear me? Super. Eddie Nickens here. I'm a longtime North Carolina native. I have a house in Raleigh, and a very little house in Morehead City. I've been fishing the albacore and bonito and all the goodness down there since 1990. I am an independent journalist, but an editor-at-large for Field and Stream, a contributing editor for Garden and Gun, and editor-in-chief of Tail, which is the planet's last remaining print fly fishing salt magazine. I think this issue is a matter of accessibility, and easability, and deliciousness. These fish are easy to get to. They're pretty easy to catch and they're awesome on a plate. And I have been frankly horrified by what I've seen inside and outside Beaufort Inlet over the last two years inside with a number of fish. They're just being brought in and laid out as brag boards day after day after day, and outside just an incredible increase in the number of people that are going to these very easy to access inshore reefs that we have, artificial reefs that we have outside of these inlets. And so, I commend the Commission for taking this up. I think this five fish, precautionary limit is supported by the North American Model of Wildlife Conservation and it's supported by the North Carolina State Constitution, which requires that we, that we manage not for this generation but for future generations. And I think this is a fabulous chance and a fabulous example of the Commission looking ahead because tomorrow is coming quicker than any of us want. The number of boats that are gonna be on our coast is gonna go up quicker than any of us can imagine. Just this week there's been reports of the proposed 200 slip marina that might be going into Radio Island right there in Morehead (City) and

Beaufort Inlet. More concerning that is, that I know for a fact that half the season ticket holders for UNC football, they've recently bought boats because they don't want to go the game, so they're headed for Beaufort Inlet this fall. We're gonna see more and more anglers out there, which is wonderful that North Carolina has these resources. But we do need some precautionary guardrail regulations on some of these species. When you have no regulations, the temptation is to think that there's no holds barred, that nothing matters. Wasted fish don't matter. Catch all you want, kill it all you want, cripple all you want. Because these fish have no value, and that's not the case. And the North Carolina Marine Fisheries Commission has the opportunity to say these fish do have value and we don't know all the answers, but this is a great and and stride at first step in, in reaching a level of understanding so we can manage these fish for future generations. So, I fully support this proposal. Thank you."

John Mauser: "Hey everybody, first off, thank you for putting this together and allowing us to be able to express our thoughts on this tonight. I am a local here on the Crystal Coast of North Carolina. I've been guiding here and chasing Atlantic bonito in the springtime for about 15 years. In the last couple years, it's become a bigger and bigger important part of my season from late March through early May with my clientele. It's the main thing we target in the month of April. Fifteen years ago when I would go out and fish and, and bonito are a structure-oriented fish, they're either on, generally, most of the time, on hard bottoms or they're on artificial reefs or other wrecks. And so, 15 years ago if you went out of Beaufort Inlet and you went and fished some of the wrecks, you know, 8:00 A.M. in the morning, you might see 20 people out there fishing. You go out there last year by 8:00 A.M. there was 50 to 60 boats on any given artificial reef right off of Atlantic Beach. And as technology has increased over the last few years, the amount of fish that are being harvested per boat has increased greatly. Ten years ago, you would troll or you would drift or cast for these fish, and you might catch five or 10 fish per boat on a good day. Nowadays, you go out there and there'll be 20 boats spot-locked directly over the structure. They will have four or five lines out with live bait, and now those numbers have climbed and some of these boats are catching a hundred Atlantic bonito per day on these wrecks. And the issue with that is not how many they're catching but how many they're keeping. And although myself, I can bring home two and my wife and I and my kids can eat it for dinner and have some left over the next day and we're not gonna freeze that fish because it's such a good fresh fish, some of these boats are keeping 50, 75, 100 of these fish per day, and it's made me sick the last couple years to see some of these anglers that are just going crazy with this, and I know these fish are going to waste, and since these fish are targeted over these certain structure areas, it's making it, you know, you're depleting a certain source. It's not like a Spanish mackerel or a bluefish or an albacore that is spread from miles and miles up and down the coast and you can have your own to target. They're all being pulled from certain areas that they congregate and it's making it harder and harder to catch them because of the technology. The fish gets smart and the areas get depleted. So, I think five fish is more than enough for any person to eat for a couple days and that's all they're good for honestly. You think about Spanish mackerel and bluefish. They're all, you know, and bluefish weren't regulated for a while, but now they're regulated. We have tons of Spanish mackerel. We have, the bluefish have made an unbelievable comeback from how they were in the '80s and '90s when they got depleted. Atlantic bonito is, just with the amount of boats that are coming out now, I see the same thing happening with no regulations on these fish. It's getting easier and easier to target them. People can figure it out and they can catch 50 a day. I don't want us to be in the same position we were 15 years ago with bluefish where you couldn't find a bluefish over two pounds in North Carolina. So, I am very much for the five (per) person limit or the five fish per person limit that you guys are looking at. I think it's smart, and I understand the gentleman, I think it was Mike who's, who was against it. I totally understand his thoughts on that and not having this science, but I've just for years now seen us wait and wait and wait for the science until the fishery's depleted and overfished, and I've also seen us have a science, something, think about flounder and not move quickly enough on it 'til the fisheries depleted, and basically there has to be a moratorium. So, I am all for trying to be proactive and and put a limit on these fish because although most people are respectful of not needing to keep more than three or four of these fish per day, some people have just completely gone crazy with the amount of Atlantic bonito they're killing, and I think this

will be something that helps us keep this amazing fish around for our kids and our grandkids. So, thank you so much for allowing me to talk. I appreciate your time tonight."

Joseph Harris: "Yes, can you hear me? Okay, my name is Joe Harris. I am a North Carolina resident born and raised here and fishing on the coast all my life. I just wanted to express my thanks for y'all especially and I am totally in favor of the five fish limit. And I would also like to say that I do appreciate that Blaine Chocklett and Eddie Nickens pronounced the fish correctly. It is an "Atlantic bonita," even though it does have an "O" on the end, that's just the way we say it. So, I am in favor and thank you all very much for for having us the ability for us to express our concerns. Thank you so much."

Sue Bertoline: Ms. Bertoline had technical issues and was unable to provide her comments during the hearing. Staff provided the information to her about other ways to share her comments with the MFC within the stated deadline.

Seeing no additional members of the public in attendance to provide public comments on the proposed rule, Commissioner Hobgood closed the hearing at 6:36 p.m.

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