

MARINE FISHERIES COMMISSION BUSINESS MEETING
Hilton Riverfront, New Bern, N.C.
May 20-22, 2015

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).

May 20

6 p.m. Public Meeting
Receive public comment relative to any fisheries management issues

May 21

9 a.m. Call to Order*
Invocation
Conflict of Interest Reminder
Roll Call
Vote on Approval of Agenda**
Vote on Approval of Meeting Minutes**

9:15 a.m. Public Comment
Receive public comment relative to any fisheries management issues

11:15 a.m. Chairman's Report
Review administrative actions and issues from the chair

- Letters
- Ethics Training Reminder
- 2015 Meeting Schedule Reminder

11:20 a.m. Issues from Commissioners

11:30 a.m. Committee Reports
Review and consideration of action items from committee meetings

- Northern
- Southern
- Finfish
- Sea Turtle
- Nominating
- Oyster and Hard Clam Fishery Management Plans
- Coastal Recreational Fishing License – Louis Daniel

11:15 a.m. Fishery Management Plans – Catherine Blum

- Status of Ongoing Plans
- Timeline for Oyster and Clam Fishery Management Plans

Noon Lunch Recess

1:30 p.m. Southern Flounder Fishery Management Plan

- Review and discuss data and options for supplement consideration – Tom Wadsworth and Chris Stewart (Presentation)

- **Vote on proposed supplement to Amendment 1 to send out for public comment****
 - Discuss timeline for next amendment
- 2:45 p.m. Spotted Seatrout Stock Assessment – Laura Lee and Mike Loeffler (Presentation)
- 3:45 p.m. Kingfish Fishery Management Plan – Beth Egbert and Kevin Brown (Presentation)
Review public comment and Division of Marine Fisheries responses and recommendations
 - **Vote on developing fishery management plan revision or initiating fishery management plan amendment****
- 4:15 p.m. Sheepshead Management – Stephen Taylor (Presentation)
Review advisory committee and public comment, and Division of Marine Fisheries position
 - **Vote on management options for sheepshead****
- 4:45 p.m. Rulemaking – Catherine Blum
 - 2014/2015 Rulemaking Cycle
 - Rulebook Update
 - **Vote on 2015/2016 Notice of Text for Rulemaking****
Review and vote on three proposed rules and associated regulatory impact analyses
 - **N.C. Striped Mullet Fishery Management Plan Amendment 1**
 - **Clarify Dredges and Mechanical Methods Prohibited Areas for Harvesting Shellfish in Internal Coastal Waters**
- 5 p.m. Rule Suspension Notification – Kathy Rawls
The Division of Marine Fisheries is providing notification of rule suspensions that are no longer needed
 - 15A NCAC 03O .0501 Procedures and Requirements to Obtain Permits
 - 15A NCAC 03M .0510 American Eel
- 5:05 p.m. Review Brad Scott Timeline – Patti Fowler (Presentation)
- 5:30 p.m. Recess

May 22

- 8:30 a.m. 2014 Landings
 - Commercial Landings - Alan Bianchi (Presentation)
 - Recreational Landings - Doug Mumford (Presentation)
- 9 a.m. Tagging Program - Mike Loeffler and Amy Comer (Presentation)
- 9:30 a.m. 2015-2016 Marine Fisheries Commission Initiatives
- 10 a.m. Director's Report - Louis Daniel
Reports and updates on recent Division of Marine Fisheries activities
 - Legislative Update
 - Oysters
 - For-hire Logbook
 - Personal Consumption Survey – John Hadley
 - Atlantic States Marine Fisheries Commission
 - American Eels
 - Quota Update
 - Shrimp Trawl Industry Workgroup Update – Kevin Brown
 - Protected Resources Update – Chris Batsavage
 - Observer Program
 - Observer Program Video
 - Incidental Take Permit Updates
 - Mid-Atlantic Fishery Management Council Update – Chris Batsavage
 - South Atlantic Fishery Management Council Update – Michelle Duval
 - Informational Materials (No Verbal Reports)
 - Rule Suspension Notices/No Action Required
 - Highly Migratory Species
 - Landings Update
 - Southern Flounder

- Red Drum
- Oyster

11:30 a.m. Issues from Commissioners

11:45 a.m. Meeting Assignments and Preview of Agenda Items for August Meeting – Nancy Fish

Noon Adjourn

2015 Meeting Dates

Feb. 18-20 Hilton Riverside, Wilmington

May 20-22 Hilton Riverfront, New Bern

Aug. 19-21 Hilton Brownstone, Raleigh

Nov. 18-20 Jennette's Pier, Nags Head

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

***Potential Action Items*

Minutes



THE MFC ADVISER
Marine Fisheries Commission Business Meeting
Hilton Riverside, Wilmington North Carolina
Feb. 18-20, 2015

The commission held a public meeting on the evening of Feb. 18, followed by a business meeting Feb. 19-20, at the Hilton Riverside in Wilmington, North Carolina.

The briefing book, presentations and audio from this meeting can be found at <http://portal.ncdenr.org/web/mf/Feb-2015-briefing%20book>.

PUBLIC MEETING – Feb. 18

Chairman Sammy Corbett called the meeting to order at 6 p.m. announcing the session would begin with an informal question and answer period, followed by a public comment period at approximately 6:30 p.m.

Division of Marine Fisheries Director Louis Daniel asked if he could make a few remarks about the for-hire logbook. He explained in 2013, the N.C. General Assembly made several changes to the for-hire licensing requirements and one of those changes was a requirement that the for-hire license holders must submit logbooks to the division summarizing catch and effort data and that the commission may adopt rules to determine the means and methods to satisfy the logbook requirements. Those rules are before the commission for final approval at this meeting to implement a weekly logbook reporting requirement. Director Daniel explained division staff is developing a logbook that captures the needed data elements, but is easy to use.

Commissioner Mikey Daniels asked where the logbook request to the legislature came from. Director Daniel explained that the division had held several stakeholder meetings with the for-hire industry along the coast and the industry wanted more representation and a greater voice in management considerations and that was the genesis of this issue.

Commissioner Mike Wicker questioned if the logbook requirement was tied to federal funding and if there could be delayed implementation that would not impact possible federal funding.

Commissioner Joe Shute asked if the General Assembly could repeal the logbook requirement. Phillip Reynolds, counsel to the commission, explained the commission could send letter to legislature expressing its desire to have the requirement removed if it chose to do so.

Commissioner Daniels said he wanted to look at the bill that passed and Reynolds advised included in the Omnibus Budget bill.

Question and Answer Session

Lee Parsons, a for-hire captain in the Wilmington area, asked what happened to a stakeholders group for a logbook and why weren't people told about the new requirement when they got licenses renewed? Director Daniel explained there meetings with stakeholder prior to the legislation be passed and also more recent meetings this past fall. He also explained all for-hire license holders were sent a letter about the requirement and there have been several news releases about the subject.

Robert Schoonmaker, with the Cape Fear Captains Association, asked the captains in the room who did not want the logbook to stand up and almost everyone in the audience did stand.

James Byrd, from Wanchese, asked if the law specifies how specific the logbook must be and Director Daniel responded that it did not.

Reese Stecher, from Dare County, said he went to the initial stakeholder meetings and didn't remember any charter captain requesting a logbook and he wanted to know when that happened. Director Daniel said he would have to go back and look at the meeting minutes, but bottom line is the division needs that information to characterize the for-hire sector for management purposes. In other words, if the sector wants allocation considerations, managers have to be able to know the impact the sector is having and that is what a logbook would provide. Stecher said he remembered asking for a for-hire representative on the commission, but never asked for a logbook. He said he thought the division stood to get a bunch of money for the logbook. Don Hesselman, the chief of the division's License and Statistics Section said there was a federal grant proposal for logbook development for a little less than \$275,000 over a two-year-period that would cover hiring biologists, a data entry clerk, supplies, and app development. Stecher said for-hire captains are being asked to do a job and are not getting paid for it. Pay them and maybe they will do it, he said.

Chairman Corbett said a lot of folks did not realize the logbook was is mandatory, including him.

Andrew Everhardt, from Carolina Beach, was concerned because it seemed many commissioners did not know the logbook was mandatory when he talked with them on the phone and he felt all commissioners should have known it. He questioned if the division had the manpower to enforce the requirement and how would the division pay for it when the federal money ran out.

Fred Walker said commercial fishermen have been dealing with logbooks for a long time and that the for-hire captains just don't want anyone to know what they catch. He said what's good for the goose is good for the gander.

David Baxley expressed that there was a safety issue of having to fill out the logbook on an app while he was on a boat a boat with clients.

Director Daniel explained they would probably have a certain time period to submit the logbooks, similar to the reporting with commercial trip ticket. He said for the trip tickets, if people forget to submit them, the division will call them first as a reminder, and that the benefits of having that data far outweigh the costs.

Ken Seigler, a commercial fisherman from Hubert, asked if seines are permitted in special secondary nursery areas. Marine Patrol Major Dean Nelson said they are prohibited by proclamation in certain areas. Seigler said it was a shame he could not use his gear.

Formal Comment Period

Alan Faircloth, of Surf City, asked why there were so few shrimp in Surf City this year and talked about the season opening late because the division said the count had to be 26-30. He questioned when this rule was developed and said he strongly disagreed with the otter trawl ban upstream of 172 bridge. He said he felt dredging at the New River Inlet to save residential property was a possible cause for shrimp quantity being so low.

Lee Parsons, a for-hire captain in the Wilmington area, said no one wants this logbook in its present form and there should be another stakeholder meeting to look at changes. He said the for-hire industry should not be considered commercial. That they do get paid for taking people fishing, but they are only allowed to keep recreational limits. He talked about the smaller water bodies in the southern a and how they are different from the rest of the state and he expressed concerns about red drum and oyster stocks.

Robert Schoonmaker, Cape Fear Captains Association, said the logbook was in works over five years and the division did the bare minimum to contact captains and he believes it could have been handled better. He felt that logbook will lead to quotas and catch shares and that it will be a huge cost in money and manpower. Using misdemeanor charge for failing to complete a logbook as threat will only lead to bad data he said, and he asked the commission to vote no on the matter.

Ryan McCoy, from Hampstead, wanted to know what the commission can do to improve the health of the fisheries.

Steve Vosnock said there aren't any oysters or fish. Why is the state not focused on rebuilding the fisheries? He said collecting data is useless but that releasing fish from hatcheries that will grow is useful. Putting shell back where marsh will grow is useful.

Dave Tempie, a guide out of Wilmington, questioned where the minutes and documentation was for meetings that had been held on the logbook.

Cane Faircloth said if the legislators had known all the for-hire captains were against the logbook, they would not have passed the requirement. He asked the commission to vote no on the logbook requirement.

Fred Holland, speaking for Charlie Schoonmaker, said the U.S. Coast Guard indicated that people being distracted causes many boating accidents and having to count how many fish were being thrown back, while handling a charter trip, would be distracting.

James Byrd said the law does not stipulate how detailed the logbook must be so just ask how many fishing days per year you fish and nothing else. Don't try and make it so complicated. He also did like the penalties for not submitting logbook and expressed frustration that people did not know it was already a law.

Tammy Baxley, owner and operator of a charter service in the Topsail area, asked the commission not to pass the rule. She said the intended logbook will be more inaccurate than accurate and that logbooks pose a safety issue. She questioned why the state needed to know how the passenger count? She did not like the threat of fines and felt it was an unacceptable requirement, just so the division can try a program with no input from public.

David Baxley said the U.S. Coast Guard prohibited mobile devices after several accidents. He felt this requirement was unfair and being rammed down their throats. He asked the commission to delay the vote until the division gets something that is workable.

Ryan Jordan, of Fugitive Fishing Charters in Oak Island, asked the recreational members on the commission to represent the for-hire industry and not support the logbook.

Henry Whitney, commercial fisherman, said the management requirements in the Shrimp Fishery Management Plan were really hurting the southern area of the state He said the shrimp opening was delayed for four weeks to get a larger count size and the shrimp migrated during that time and were gone. He also said the \$25 Shellfish License is devastating the oyster resource.

Lee Johnsons said nothing good comes from logbooks and that commercial fishermen and charter fishermen need to start working together.

Garry Nowell, a live bait fisherman from Brunswick County, said last year the commission voted on the issue of allowing them to shrimp on Saturday until noon, but he has not heard anything further on that issue. He said Sunset Beach to the South Carolina state line is the only area to find the small shrimp they are looking for.

Jason Dale, for-hire captain, said he feels blindsided by the for-hire logbook issue and asked the commission and the division to be honest with the captains about the direction of this logbook.

Reese Stecher, said fishing was better before the Fisheries Reform Act and the Coastal Recreational Fishing License. He said he felt the division crammed the striped bass tagging program down their throats and that did not work well. He said for-hire captains don't get paid what state employees get paid, and should not have to spend their time off filling out forms for the division. He asked the commission that if they would not vote no, to postpone the vote until May and let them get legislators involved.

Director Daniel said he had no idea the logbook would create this level of discontent and that he was committed to working with the industry to come up with better logbook. He said logbook data will help protect the for-hire industry if there are closures. He said there will likely be a delay, because the last thing he wants to do is shove something down their throats.

Denny McCuiston, a live bait shrimper from Wrightsville Beach, said he thought the commission had approved live bait issue, and did not understand why they were voting again on the Shrimp Fishery Management Plan.

Director Daniel explained that the commission had previously selected its preferred management options for the Shrimp Fishery Management Plan, but that the rulemaking process was a lengthy process that included hearings and public comment periods and review by the Office of Administration Hearings and the Rules Review Commission and that the Shrimp Fishery Management Plan rules were just now being brought to the commission for final approval. The Shrimp Fishery Management Plan would not be final until the rules are final, but once that happens, then the different management strategies start going into effect, he said.

Charles Robbins, is a for-hire guide and volunteers with the Cape Fear River Watch to help restore striped bass, said we must pay for the opportunity to live off the land. A lot of states' licenses are really high and as the economy has tanked, the oyster beds are wrecked he said. He thinks the commission is trying to help the industry and everyone needs to calm down. He closed by saying this logbook issue will get itself worked out and we should focus our energy in a positive way.

Casey Jones, of Surf City, said he was concerned about Stump Sound opening shrimp count and that the division needs to contact the people that work that area to find out what is realistic. He said he would like to open as early as Aug. 15 and if the shrimp don't get to a count they are happy with by a certain date, go ahead and open it. The shrimp will never get to that size consistently in our area, he said.

Fred Walker said that a 26-30 count shrimp will never happen and they need to be able to thin them out. He said if the commission would allow channel netters to get small shrimp it would reduce bycatch by 40 percent.

Ken Seigler, a commercial fisherman from Hubert, talked about marketable size for shrimp and consumer preferences and that a smaller shrimp was acceptable. He said there are ecologically sound methods of harvest available without hindering harvest. He advocated that primary, secondary and special secondary nursery areas be opened to gears other than trawls to catch shrimp.

Terry Pratt, president of the Albemarle Fishermen's Association, said the Fisheries Reform Act delegates authority to the commission and questioned how did a commission rule get attached to an omnibus budget bill and become law without the commission's knowledge.

Jake Griffin said he knows the for-hire captains don't want the logbooks. He suggested that maybe the division should start over with the logbook issue and include the for-hire captains to come up with something they can live with. He also asked that with observers on the boats, could the commission ask to look at reopening southern area to beach seines within 100 yards of the beach.

Will Epperson, a recreational fisherman from Hampstead, said he had concern for North Carolina's fishery and that we should be producing more fish than we are. He thinks we should look at better commercial fishing gear and protect oysters and limit bycatch. He also asked the commission to consider making red drum, spotted seatrout and striped bass game fish so our fishery will be better.

BUSINESS MEETING - MOTIONS AND ACTIONS – Feb. 19-20

Chairman Sammy Corbett convened the Marine Fisheries Commission business meeting at 9 a.m. and reminded commissioners of their ethics requirements.

The following commission members were in attendance: Sammy Corbett-Chairman, Anna Beckwith-Vice Chair (via conference call), Mikey Daniels, Kelly Darden, Mark Gorges, Chuck Laughridge, Joe Shute, Mike Wicker and Alison Willis.

**Motion by Mikey Daniels to approve the agenda. Motion seconded by Alison Willis.
Motion passes unanimously.**

**Motion by Joe Shute to approve the minutes with the correction stated by Mikey Daniels.
Motion seconded by Chuck Laughridge.
Motion passes unanimously.**

Public Comment

Director Daniel said that clearly some issues with the division that led to some of the confusion, but we are not trying to shove this logbook down anybody's throat. He said there was no concern with delaying implementation until we get stakeholder buy-in. The question for today is whether or not to require weekly reporting or not, he said

Bill Hickman said that the near shore gill net closure was having a direct impact on lives and economy of gill net fishermen in Brunswick County and he wants to get it reopened. He also said crab pot theft was an issue in entire state, especially Brunswick County, and it needed to be seriously addressed and the penalties readdressed. Director Daniel said it was not just a problem in southern part and he was working on possible rule changes.

Matt Wirt, with Real Adventure Charters out of Wilmington asked if the commission had to vote to pass the logbook before it becomes effective and was advised by the commission's counsel that the logbook requirement is already in statute and that effectiveness of the statute is put in place by the commission rules. Wirt wanted to know how will the for-hire guides give you buy-in when the letter received just last week still said the commission was voting on the specifics of the logbook.

Mark Cogdell, a Wilmington charter captain, asked the commission to table the logbook discussion.

Mitchell Smith, commercial fisherman from southern Brunswick County, talked about the 100-yard gill net rule. He said the fishery in Brunswick County is different than other fisheries in the state, because in October and November the spot are right up to the beach. He asked if the commission could allow gill nets within 100 yards of the shore in October and November for the spot season in Brunswick County. Director Daniel explained that restriction is part of a federal plan to protect bottlenose dolphin and that he could not remove the prohibition.

Dawn York, with the Cape Fear River Basin Partnership, presented the commission with an action plan and asked for support to help build fish passages at the Cape Fear Lock and Dam Numbers 2 and 3 to help restore migratory fish stocks.

Brad Scott said he wants North Carolina to be the same as other states and allow hatcheries in closed waters and was told his issue would be fixed in the Oyster Fishery Management Plan, but that his issue was pulled from the plan. He asked the commission to return the issue to the fishery management plan. He said he was told it was pulled because of public health concerns, but all the other states allow it and that shellfish is shipped into North Carolina. He asked the commission to vote to put his issue back into the Oyster Fishery Management Plan.

Robby Wolfe asked the commission to vote no on the logbook saying that special interests may benefit from the requirement, but not the for-hire industry.

Mike Hoffman said he wanted Director Daniel to step down from his position because not doing anything for the for-hire industry or for North Carolina.

Blakely Hildebrand, with the Southern Environmental Law Center and speaking on behalf of the N.C. Wildlife Federation, said they want meaningful protection for bycatch species and habitat protection. Access to fresh shrimp comes at a cost, she said, and the commission has failed with the Shrimp Fishery Management Plan and they are concerned the amendment stops short of protecting finfish. She said the proposed rules do not require additional bycatch reduction devices and that headrope length should be capped at 90 feet, and that the 225-foot limit is excessive. She wants the commission to initiate rulemaking to propose a 90-foot limit. She said there was concern that the director's proclamation authority could lift protections already in place and she asked the commission to protect nursery areas by reviewing nursery area designations.

Adam Tyler, a commercial fisherman from Smyrna, said that the previous commenter neglected to recognize the steps already taken to reduce bycatch and misuses ratios to estimate bycatch. He said the commission should not allow management options not discussed by the advisory committee to be considered and there was no research to backup headrope limit. He said the requests from the Southern Environmental Law Center violate the fishery management plan process.

Lauren Morris, with the N.C. Fisheries Association, talked about all the bycatch reduction research and work that has taken place over the years and that the commercial industry has been actively engaged in. She said considering requiring shrimp counts would be outside of the process and did not support expanding the director's proclamation authority. As for southern flounder, the industry wants to be part of any discussions of future management and hopes to be an integral part of what happens going forward.

Ernie Foster, with N.C. Waterman United and also operates Albatross Fleet charters, said his organization was in opposition to proposed logbook. He said this was the classic example of death by a thousand cuts, and the logbook was just one more burden. He said he could travel almost anywhere in the world with a passport with one photo, but to take a boat to the Gulf Stream requires three IDs and a

driver's license. He asked if there was a charter boat category on the commission and Commissioner Joe Shite advised he was a charter board captain.

Jot Owens said the logbook issue is coming on too quickly and it feels like it is being shoved down our throats. He asked the commission to table the issue.

Trevor Smith asked what if cab drivers were required to mark in a logbook every time they see different colored cars while they have passengers. He said any data that comes off the charters needs to be at the dock and not out on the water He said he can't record data when he has lives to keep safe on the boat.

Ryan Jordan said everyone was misinformed about the logbook and that the vote is about implementation and not reporting.

Ron Beardstead said at the previous stakeholder meetings in 2011 the discussion was primarily about inefficiencies of the Coastal Recreational Fishing License for inshore guides and that the logbook was a tag on at the end.

Terry Pratt, president of the Albemarle Fishermen's Association, said his organization recommends that the moratorium on river herring be suspended for three years that there needed to be more dedicated effort toward habitat. Currently, there is no sampling to provide estimates of abundance and water quality is also an issue, he said. He encouraged the commission to get the Coastal Habitat Protection Plan up and running.

Sonny Davis, who owns the Captain Stacy in Atlantic Beach, said he has had to keep logbook for past 35 years and turn in every day, but all charter captains are 100 percent against this logbook. He said they already have enough to do to keep boats going. He said he didn't like that the shad fishery in Pamlico Sound was limited to just a few months and that the gill net restrictions were too much – there are no turtles in the sound this time of year, he said.

Tom Ronner, a gill netter from Middle Sound, asked why there was a 100-yard gill net ban off the beach when it was a stop net that caught the dolphin? He said the \$25 oyster license was a bad idea when implemented and was hurting the resource by destroying the oyster rocks. He opposes the logbook.

Michael Dennis said the division is listening but not hearing and that the opposition for for-hire logbook is tremendous. He said we should implement a call-in procedure for speckled trout, flounder and red drum for all recreational anglers and let everyone contribute. That way you will end up with a better set of data than from forcing a logbook, he said.

Tom Kloteros opposed the logbook and felt it was too much burden. He said the commission needs to protect juvenile fish.

Walter Bateman, an inshore fisherman out of Swansboro, asked the commission to postpone the vote and to work with the for-hire captains to get a better plan.

Chairman's Report

Chairman Corbett asked commission liaison Nancy Fish to review letters that were received and sent on various issues since the last commission meeting last meeting. Fish also reviewed the annual appointments to the advisory committees and reminded the commission of its ethics training requirements.

The commission was reminded of its 2015 business meeting schedule:

Feb. 18-20 Hilton Riverside, Wilmington
May 20-22 Hilton Riverfront, New Bern
Aug. 19-21 Hilton Brownstone, Raleigh
Nov. 18-20 Jennette's Pier, Nags Head

Issues from Commissioners

Commissioner Mikey Daniels talked about the need to respect one another and to get along and that these are difficult times and he wants the commission to have compassion and concern when making decisions.

Commissioner Joe Shute expressed concern about the for-hire logbook and that it might be a good idea to ask the N.C. General Assembly to get more stakeholder input on the issue.

Motion by Joe Shute to have the chairman send a letter on behalf of the commission to the N.C. General Assembly asking it to revisit the requirement for a logbook for the for-hire industry. Motion withdrawn.

It was decided to talk about the logbook issue later in the meeting under rulemaking, where it was listed on the agenda.

Commissioner Mike Wicker talked about supporting the recommendation of the Cape Fear River Partnership to construct of a rock weir fish passage at the Cape Fear River Lock and Dam Numbers 2 and 3. This would be done to help restore migratory fish stocks in the Cape Fear River system.

Motion by Mike Wicker that the commission send a letter of endorsement to the Cape Fear River Partnership, with appropriate parties copied, for the construction of a rock weir fish passage at the Cape Fear River Lock and Dam #'s 2 and 3 to achieve a very major step forward in the restoration of migratory fish stocks in the Cape Fear River system, such as American shad, striped bass and sturgeon. Many of these fish migrate from Smiley Falls, upstream of #3 where they spawn, to other areas downstream, the coast, and their habitat cannot be considered as a single area. Motion seconded by Chuck Laughridge. Motion passes unanimously.

Committee Reports

The commission received minutes from all of the advisory committees that had met since the last commission meeting and received the following reports from advisory committees that had action items:

Coastal Recreational Fishing License Committee

Division Director Louis Daniel provided an updated on the commission committee that makes funding decisions on the Coastal Recreational Fishing License Grant Program. On Dec. 19, 2014, the Coastal Recreational Fishing License Committee approved funding for 18 proposals, totaling \$1,551,623.

Motion by Chuck Laughridge for the chairman to appoint a Coastal Recreational Fishing License Advisory Committee to advise the existing Marine Fisheries Commission Committee on the Coastal Recreational Fishing License Grant Program. Motion seconded

by Joe Shute. Motion amended (see below) to make the number of membership in the committee at least three, but no more than five, including at least one for-hire representative.

Motion by Chuck Laughridge to request that the chairman convene a Coastal Recreational Fishing License Advisory Committee to advise the existing Marine Fisheries Commission Committee on the Coastal Recreational Fishing License Grant Program. The number of members in the committee should be at least three, but no more than five, and include at least one for-hire representative. Motion seconded by Joe Shute. Motion passes unanimously.

Rulemaking Update and Fishery Management Plan Final Approval

Catherine Blum, the division's rulemaking coordinator, reviewed information on the two public hearings that were held, along with an update on comments received, regarding the 2014/2015 rule package and she reviewed the rules being proposed.

The commission gave final approval to amendments to the shrimp, bay scallop and river herring fishery management plans and associated permanent rules.

The commission also voted to adopt the following slate of rules, which could take effect as early as May 1:

- Implement a for-hire endorsement on the commercial fishing vessel registration.
- Combine two separate ocean pier licenses into one Ocean Fishing Pier License with the same net cost, as provided in statute.
- Update and relocate a rule that provides the Division of Marine Fisheries director's authority to issue proclamations to resolve user conflicts concerning public trust resources.
- Update the name of a canal in Brunswick County.
- Remove the permit fee for the Atlantic Ocean Striped Bass Commercial Gear Permit, which is now provided in statute, and eliminate the Nov. 1 deadline to purchase the annual permit.
- Correct an error in the inland/coastal waters boundary line in Queens Creek, Onslow County.
- Correct grammatical errors and spacing in several rules.
- Modify rules pertaining to the Division of Marine Fisheries director's proclamation authority, for consistency.

The commission voted to delay voting on a proposed rule regarding a for-hire logbook requirement until its August meeting in order to get more stakeholder input before the final decision.

The proposed rule would implement a recent change in state law and require charter and guide captains to submit a logbook detailing their for-hire fishing activity for the previous week. Logbook reporting is needed to provide timely and detailed catch information to the N.C. Division of Marine Fisheries for management purposes.

The commission delayed voting on implementing Addendum III to the Atlantic States Marine Fisheries Commission Fishery Management Plan for American Eel until later in the meeting.

Motion by Mikey Daniels to approve Amendment 1 to the N.C. Shrimp Fishery Management Plan and associated permanent rules. Motion seconded by Anna Beckwith. Motion passes 7-2.

Motion by Alison Willis to approve the Bay Scallop Fishery Management Plan Amendment 2 and associated permanent rules. Motion seconded by Mikey Daniels. Motion passes unanimously.

Motion by Chuck Laughridge to approve the River Herring Fishery Management Plan Amendment 2 and associated permanent rules. Motion seconded by Kelly Darden. Motion passes unanimously.

Motion by Anna Beckwith to approve final adoption of Rule 15A NCAC 03O. 0112 regarding the for-hire logbook with an effective date of Jan. 1, 2016. Motion seconded by Chuck Laughridge. Motion fails 2-6, with one abstention.

Motion by Mike Wicker to delay the vote on Rule 15A NCAC 03O. 0112, regarding the for-hire logbook, until the August meeting in order to get stakeholder input. Motion seconded by Mark Gorges. Motion passes 7-1, with one abstention.

Motion by Chuck Laughridge to approve final adoption of 15A NCAC 03I .0101; 03O .0101; 03O .0106; 03O .0501; 03O .0503 for the for-hire license and the Atlantic Ocean striped bass commercial gear permit. Motion seconded by Alison Willis. Motion passes unanimously.

Motion by Mikey Daniels to approve 15A NCAC 03O. 0101; 03O .0106; 03O .0113 for ocean pier licensing changes; 03I .0122; 03J .0301 for user conflict rule relocation; 03J .0207; 03Q .0202 for Queens Creek coordinate correction and canal name change. Motion seconded by Chuck Laughridge. Motion passes unanimously.

Rule Suspensions

The commission voted to continue suspension of the following rules:

Motion by Chuck Laughridge to suspend portions of 15A NCAC 03M .0519 regarding shad. Motion seconded by Joe Shute. Motion passes unanimously.

Motion by Chuck Laughridge to suspend portions of 15A NCAC 03Q .0107 regarding shad. Motion seconded by Alison Willis. Motion passes unanimously.

Fishery Management Plan Update

Catherine Blum, the division's fishery management plan coordinator, reviewed the status of various state and interjurisdictional fishery management plans. The commission voted to send the draft Striped Mullet Fishery Management Plan Amendment 1 forward for rulemaking. The draft amendment proposes increasing the target fishing mortality reference point in recognition of striped mullet's importance as prey species to many important finfish species; prohibiting runaround, drift or other non-stationary gill nets from blocking more than two-thirds of a waterway or interfering with navigation (similar to the current rule for fixed or stationary gill nets); and removing the gill net attendance requirement from Oct. 1 through Nov. 30 in the Newport River Trawl Nets Prohibited Area while leaving it subject to an attendance requirement from May 1 through Sept. 30.

**Motion by Joe Shute to send the draft Striped Mullet Fishery Management Plan Amendment 1 forward for rulemaking. Motion seconded by Mark Gorges.
Motion passes unanimously.**

Atlantic States Marine Fisheries Commission's American Eel Interstate FMP Addendum III Rule

The commission voted to approve implementation of Addendum III to the Atlantic States Marine Fisheries Commission Fishery Management Plan for American Eel, including a nine-inch minimum size limit, a 25-fish recreational possession limit, and a no-possession requirement for American eels from Sept. 1 to Dec. 31, unless they are taken with baited pots. These regulations have been in place via proclamation since Jan. 1, 2014 to maintain compliance with Addendum III. Additional changes also include a minimum mesh length requirement of one-half-by-one-half-inch mesh for eel pots, allowing for a phase-in period until Jan. 1, 2017.

**Motion by Chuck Laughridge to approve final adoption of 15A NCAC 03J .0301 and 03M .0510 for the ASMFC American Eel Interstate FMP Addendum III. Motion seconded by Alison Willis.
Motion passes unanimously.**

Petition for Declaratory Ruling

The commission was presented with a petition for a declaratory ruling from American Eel Farm, LLC and the Division of Marine Fisheries regarding 15A NCAC 03M .0510 as it relates to possession by the petitioner of eels under nine inches in length. Commission counsel Phillip Reynolds reviewed the declaratory ruling process and division director Louis Daniel reviewed the request with the commission. The commission voted to grant the request and ruled in favor of the petitioner.

**Motion by Alison Willis to grant the request of American Eel Farm for a declaratory ruling. Motion seconded by Mikey Daniels.
Motion passes unanimously.**

**Motion by Chuck Laughridge to rule in favor of the petitioner in the declaratory ruling. Motion seconded by Joe Shute.
Motion passes unanimously.**

Stakeholder Workgroup/Bycatch Reduction Device Testing Update

Kevin Brown, the division's gear development specialist, gave the commission an update on bycatch reduction device testing and the formation of a stakeholder workgroup. After meeting with industry, Brown reported that the in-kind contribution of 60 sea days, that had been discussed at the commission's November 2014 meeting, had been confirmed and that the first meeting of the stakeholder workgroup had been scheduled for March 31 at the History Center at Tryon Palace in New Bern.

Southern Flounder Stock Assessment

Will Smith, division stock assessment scientist, and Tom Wadsworth, division southern flounder biologist, reported on the draft 2014 N.C. Southern Flounder Stock Assessment. They advised the commission that the division did not accept the stock assessment for management purposes after three peer reviewers noted the same concerns the division has. Some of the concerns are about recent studies showing that the North Carolina stock of southern flounder mixes with stocks in other South Atlantic states. These concerns can only be addressed with a regional stock assessment that includes data from other states. Director Daniel advised the commission that while the stock assessment cannot be used for management, the North Carolina data show declining recruitment, which is the number of young fish entering into the stock, since the 1990s. He said this is evidence of the need for further management measures. He reported recent studies have shown that southern flounder mature at 16 inches, which means a large number of the fish caught in North Carolina are immature and have not had the opportunity to move out into the ocean to spawn in the fall. There was discussion about the need to allow more flounder to "escape" into the ocean to help increase recruitment.

To view the presentation, go to <http://portal.ncdenr.org/web/mf/Feb-2015-briefing%20book> and scroll down to the "Presentation" section.

The commission voted to pursue a supplement to the N.C. Southern Flounder Fishery Management Plan to reduce the catch of southern flounder by between 25 percent and 60 percent. The division will present options to the commission on ways to do this at its May meeting. If the commission votes to move forward with a supplement, a public comment period will be held and a final vote on the supplement would take place at the commission's August meeting. A supplement will allow the commission to adopt temporary management measures for the upcoming fall season without going through the full fishery management plan process.

Motion by Mike Wicker to ask the Division of Marine Fisheries to provide the Marine Fisheries Commission with the range of harvest reduction from the stock assessment that would result in stock recovery (including discard mortality and unintentional mortality), recognizing its limitations, and statistics appropriate for management decisions, and to begin the supplement process.

Motion fails for lack of second.

Motion by Chuck Laughridge to pursue a supplement to reduce catch of southern flounder by no less than 25 percent and no greater than 60 percent. Motion seconded by Mark Gorges.

Motion passes 8-1.

Sheepshead Management

Stephen Taylor, biologist supervisor for the division's southern district, reviewed the status of the sheepshead fishery in North Carolina and presented several management options for the

commission's consideration. Taylor advised the division recommended sending this information out to the commission's pertinent advisory committees for review and comment.

To view the presentation, go to <http://portal.ncdenr.org/web/mf/Feb-2015-briefing%20book> and scroll down to the "Presentation" section.

Motion by Mike Wicker to send the draft issue paper on the need for and impacts of sheepshead size, creel and trip limits to relevant standing and regional advisory committees for public input during the spring 2015 scheduled meetings. Motion seconded by Joe Shute. Motion passes unanimously.

N.C. Commercial Fishing Resource Fund Update

Last year the N.C. General Assembly passed G.S. 113-173.1, the North Carolina Commercial Fishing Resource Fund, which provides funding for the development of sustainable commercial fishing in the state through an increase in the cost of certain commercial fishing licenses. The first priority is to fully fund the state's incidental take permits, with any additional funds to go to other projects to develop and support sustainable commercial fishing in the state. The Marine Fisheries Commission and a Funding Committee established by the statute are to develop and implement a memorandum of understanding for procedures for agreeing to and authorizing the disbursements to fund the projects.

Lauren Morris, with the N.C. Fisheries Association, presented the following appointments to the Funding Committee:

- Albemarle Fisherman's Association – Gilbert Baccus
- Brunswick County Fisherman's Association – Steve Parrish
- Carteret County Fisherman's Association – Bill Hooper
- Ocracoke Working Waterman's Association – Ernest Doshier
- N.C. Waterman United – Andrew Berry
- N.C. Fisheries Association – Benny O'Neal

The commission voted to request that the chairman convene a Marine Fisheries Commission Commercial Fishing Resource Committee comprised of members of the commission holding the three commercial seats and delegate authority to that committee for funding decisions related to the N.C. Commercial Fishing Resource Fund.

Motion by Mike Wicker to request the chairman to convene a Marine Fisheries Commission Commercial Fishing Resource Fund Committee comprised of members of the commission holding the three commercial seats and delegate authority to that committee for funding decisions related to the N.C. Commercial Fishing Resource Fund pursuant to NCGS 113-173.1. Motion seconded by Chuck Laughridge. Motion passes unanimously.

Issues from Commissioners

Commissioner Mike Wicker felt the proposed Southern Flounder Fishery Management Plan Supplement voted on earlier in the meeting would create an increase in people applying for

pound net permits and wanted to have a temporary freeze on issuing new pound net permits or allowing transfers of flounder pound net permits.

Motion by Mike Wicker to direct the Marine Fisheries Director to undertake the steps necessary under his authority, including the issuance of a proclamation and/or rule suspension, to preclude the division from accepting new permit applications or requests for transfer for flounder pounds net permits as of March 2, 2015 until such time as the commission takes final action on the requested Southern Flounder Supplement, as provided for in the commission's earlier action. Motion seconded by Chuck Laughridge. Motion fails 3-3, with 3 abstentions.

The meeting adjourned.

THE MFC ADVISER
Marine Fisheries Commission Special Meeting
Division of Marine Fisheries Headquarters, Morehead City, North Carolina
March 12, 2015

The commission held a special meeting at 4:30 p.m. on March 12, 2015 at the Division of Marine Fisheries headquarters in Morehead City, N.C. to consider candidates for an at-large seat for the Mid-Atlantic Fishery Management Council.

The following commission members were in attendance: Sammy Corbett-Chairman, Mikey Daniels (via conference call), Chuck Laughridge, Joe Shute, Mike Wicker (via conference call) and Alison Willis.

Chairman Corbett called the meeting to order and reminded the commission of its conflict of interest requirements. He then asked Commissioner Chuck Laughridge, chairman of the commission's Nominating Committee, to report to on the recommendation from that committee.

Commissioner Laughridge reported that the Nominating Committee had met at 4 p.m. on March 12 and had voted to ask the commission to add the name of Mr. Kenneth Cole "Casey" Wagner to the list of Mid-Atlantic Fishery Management Council at-large candidates for consideration by the governor.

Chairman Corbett asked if anyone would like to put a motion forward.

**Motion by Chuck Laughridge, made on behalf of the Nominating Committee, to add Casey Wagner to the Mid-Atlantic Fishery Management Council slate of nominees.
Motion passes unanimously.**

The meeting adjourned.

Chairman's Report





**NORTH CAROLINA MARINE FISHERIES COMMISSION
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES**

COMMISSIONERS

PAT MCCRORY
Governor

DONALD VAN DER VAART
Secretary

SAMMY CORBETT
Chairman

ANNA BECKWITH
Morehead City
MIKEY DANIELS
Wanchese
KELLY DARDEN
Greenville
MARK GORGES
Wrightsville Beach

CHUCK LAUGHRIDGE
Harkers Island
JOE SHUTE
Morehead City
MIKE WICKER
Raleigh
ALISON WILLIS
Harkers Island

March 3, 2015

Ms. Janet Cowell, Treasurer
The Department of State Treasurer
325 North Salisbury Street
Raleigh, NC 27603-1385

Dear Ms. Cowell:

Session Law 2005-455, Senate Bill 1126 established the Coastal Recreational Fishing License. This Legislation establishes both the Marine Resources Endowment Fund (G.S. 113-175.5) and the Marine Resources Fund (G.S. 113-175.1). The revenues from these funds can only be disbursed with the approval of the chair of the Marine Fisheries Commission.

This will serve as notification of disbursements approved by the Marine Fisheries Commission. Monies have been approved to be disbursed from the Marine Resources Fund with the following listing showing the specific project and budget approved by the Marine Fisheries Commission, with consultation of the Wildlife Resources Commission.

Project Title	FY 2014-15 Funding
N.C. Coastal Recreational Fishing Digest	\$30,500
Total	\$30,500

Jeannie Betts, Controller for N.C. Department of Environment and Natural Resources (DENR) will process these disbursements from the cash available in the fund. The Division of Marine Fisheries assigned coordinator for these projects is Beth Govoni and she can be reached at (252) 808-8004 with any questions.

Sincerely,

A handwritten signature in black ink that reads "Sammy Corbett".

Sammy Corbett, Chairman
N.C. Marine Fisheries Commission

cc: Mercidee Benton, OSBM Budget Analyst
Louis Daniel, DMF Director
Doug Lewis, DENR Director BP&A
Jeannie Betts, DENR Controller



NORTH CAROLINA MARINE FISHERIES COMMISSION DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

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JOE SHUTE
Morehead City
MIKE WICKER
Raleigh
ALISON WILLIS
Harkers Island

MEMORANDUM

TO: Sea Turtle Advisory Committee

FROM: Sammy Corbett, Chairman
Marine Fisheries Commission

DATE: March 5, 2015

SUBJECT: Charge to the Sea Turtle Advisory Committee

There have been a number of committees in the past that have provided advice to the Marine Fisheries Commission and the Division of Marine Fisheries regarding sea turtles. The previous Sea Turtle Advisory Committee was created in 2010 under a lawsuit settlement agreement between the state and the Karen Beasley Sea Turtle Rescue and Rehabilitation Center to assist in protecting threatened and endangered sea turtles. The settlement agreement provisions were incorporated into the Sea Turtle Incidental Take Permit issued to North Carolina by the National Marine Fisheries Service, thereby removing the mandate for the committee.

However, the commission believes there is a need to continue with this committee, and voted to restructure its appointment and operating processes to align with those of our other commission advisory committees. While there are several folks that have served as sea turtle advisers previously, we also have several folks that are new to our committee process. I'd like to take this time to welcome all of you and thank you for your willingness to serve.

The following committee charge was adopted by the commission on Nov. 20, 2014 in order to facilitate effective operation of your panel:

Sea Turtle Advisory Committee Charge

- **Providing recommendations on reducing sea turtle interactions in commercial and recreational fisheries;**
- **Reviewing information on sea turtle strandings and interactions; and**
- **Assisting with public education.**



**NORTH CAROLINA MARINE FISHERIES COMMISSION
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CHUCK LAUGHRIDGE
Harkers Island
JOE SHUTE
Morehead City
MIKE WICKER
Raleigh
ALISON WILLIS
Harkers Island

March 12, 2015

Secretary Donald van der Vaart
N.C. Department of Environment and Natural Resources
1601 Mail Service Center
Raleigh, NC 27699-1601

Dear Secretary van der Vaart:

Enclosed for your signature is a letter to Governor McCrory endorsing the nomination of a slate of qualified candidates for consideration by the U.S. Secretary of Commerce for an at-large appointment to the Mid-Atlantic Fishery Management Council. The Magnuson-Stevens Fishery Conservation and Management Act specifies that state governors must submit a slate of not less than three qualified individuals for each applicable council vacancy. Council appointments will be effective August 2015. Mr. Preston Pate currently serves as a North Carolina at-large appointee to the Mid-Atlantic Fishery Management Council and is seeking reappointment. State governors must submit nominations for council appointments to the National Marine Fisheries Service no later than March 15, 2015.

The N.C. Marine Fisheries Commission compiled a slate of nominees for an at-large appointment to the Mid-Atlantic Fishery Management Council in accordance with N.C. General Statute 113-260. The commission submits the names of Mr. Preston Pate, Dr. Roger Rulifson, Ms. Sara Winslow and Mr. Casey Wagner for your review and Governor McCrory's consideration as nominees for a N.C. at-large appointment to the Mid-Atlantic Fishery Management Council. All of the nominees are North Carolina residents, and by reason of their occupational or other experience, scientific expertise or training, are knowledgeable regarding the conservation and management of the commercial or recreational harvest of North Carolina's fisheries resources.

The enclosed draft letter from Governor McCrory to the National Oceanic and Atmospheric Administration Assistant Administrator for Fisheries addresses the requirements of the Magnuson-Stevens Fishery Conservation and Management Act concerning the nominees' residency, knowledge of fisheries of the council's geographical area, and persons that were consulted in the recreational and commercial communities regarding the nominations. The Division of Marine Fisheries has reviewed the nomination materials submitted by the candidates to ensure all forms are complete and all required information is provided. It is requested the enclosed nomination materials be forwarded to Mr. Charles Duckett in the governor's office as soon as possible. The governor's letter and the enclosed nomination materials must be received by the National Marine Fisheries Service no later than March 15, 2015.

Secretary van der Vaart
March 12, 2015
Page 2

Thank you for the opportunity to participate in the nomination process for an at-large appointment to the Mid-Atlantic Fishery Management Council. Should you have questions or need additional information concerning the nominees or the nomination process, please feel free to contact me or Dr. Michelle Duval, Executive Assistant for Councils, Division of Marine Fisheries, P.O. Box 769, Morehead City, NC 28557, phone 252-808-8011.

Sincerely,



Sammy Corbett, Chairman
N.C. Marine Fisheries Commission

MD/nf

Enclosure

cc (letter only): Mary Joan Pugh Louis Daniel
 Charles Duckett Nancy Fish
 John Broome Michelle Duval
 Brad Knott Caroline Daly
 Matthew Dockham

2015 GUBERNATORIAL AND TRIBAL NOMINATIONS TO
THE REGIONAL FISHERY MANAGEMENT COUNCILS

On August 10, 2015, 30 terms will expire for 20 obligatory (state-specific) and 10 at-large seats on the eight Regional Fishery Management Councils. Listed below are the Governors' nominations, in alphabetical order, for each seat becoming vacant this year.

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NEW ENGLAND FISHERY MANAGEMENT COUNCIL

VACANT SEATS

Obligatory
Obligatory
Obligatory
Obligatory
At-large

INCUMBENTS¹

Matthew G. McKenzie/CT/O
Terry A. Alexander/ME/C
**David E. Preble/RI/R
John F. Quinn/MA/O
Vincent M. Balzano/ME/C

STATE

OBLIGATORY NOMINEES

AT-LARGE NOMINEES

Connecticut	*Matthew G. McKenzie Gregory Myerson Franklin A. Rathbun	No submission
Maine	*Terry A. Alexander Margaret "Maggie" J. Raymond Raymond C. Swenton	*Vincent M. Balzano Margaret "Maggie" J. Raymond Raymond C. Swenton
Massachusetts	Catherine E. O'Keefe Alicia M. Pradas-Monne *John F. Quinn	No submission
New Hampshire		No submission
Rhode Island	Donald E. Fox Gregory J. Mataronas, Sr. Theodore A. Platz, III Eric E. Reid	No submission

*Renominated

**This member has served three consecutive terms and is ineligible by law to be reappointed.

¹ Incumbent sector identified as C (commercial), R (recreational), or O (other).

2015 GUBERNATORIAL AND TRIBAL NOMINATIONS TO
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MID-ATLANTIC FISHERY MANAGEMENT COUNCIL

VACANT SEATS

Obligatory
Obligatory
At-large
At-large

INCUMBENTS¹

Jeffery D. Deem/VA/R
Christopher J. Zeman/NJ/O
Anthony D. Dilernia/NY/R
Preston P. Pate, Jr./NC/O

STATE

OBLIGATORY NOMINEES

AT-LARGE NOMINEES

Delaware

No Submission

Virginia

Charles Meade Amory
Peter L. deFur
Kennedy "Ken" E. Neill, III

No Submission

Maryland

No Submission

New Jersey

Eleanor A. Bochenek
Adam C. Nowalsky
*Christopher J. Zeman

No Submission

New York

Patrick H. Augustine
*Anthony D. Dilernia
Lisa R. Poyer

North Carolina

Roger A. Rulifson
Kenneth "Casey" Wagner
Sara E. Winslow

Pennsylvania

No submission

*Renominated.

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SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

VACANT SEATS

Obligatory
Obligatory
At-large
At-large

INCUMBENTS¹

Benjamin C. Hartig, III/FL/C
Edward "Zack" Z. Bowen/GA/R
Charles M. Phillips/GA/C
Anna B. Beckwith/NC/R

STATE

OBLIGATORY NOMINEES

AT-LARGE NOMINEES

North Carolina

*Anna B. Beckwith
Charles "Bernie" McCants, Jr.
Robert J. Lorenz

South Carolina

No submission

Florida

*Benjamin C. Hartig III
Robert A. Johnson
Scott A. Taylor

No submission

Georgia

*Edward "Zack" Z. Bowen
Wendell C. Harper
John C. A. Marr

*Charles M. Phillips
Richard A. Vendetti, Jr.
John A. Wallace

*Renominated.

¹ Incumbent sector identified as C (commercial), R (recreational), or O (other).

2015 GUBERNATORIAL AND TRIBAL NOMINATIONS TO
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CARIBBEAN FISHERY MANAGEMENT COUNCIL

VACANT SEAT

Obligatory
At-large

INCUMBENT¹

Carlos F. Farchette/VI/O
Eugenio Piñeiro-Soler/PR/R

STATE

OBLIGATORY NOMINEES

AT-LARGE NOMINEES

Puerto Rico

*Eugenio Piñeiro-Soler
Roberto M. Silva
Carlos J. Velazquez

U.S. Virgin Islands

Thomas Daley
*Carlos E. Farchette
Daniel Santiago-Colon

*Renominated.

¹ Incumbent sector identified as C (commercial), R (recreational), or O (other).

2015 GUBERNATORIAL AND TRIBAL NOMINATIONS TO
THE REGIONAL FISHERY MANAGEMENT COUNCILS

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GULF OF MEXICO FISHERY MANAGEMENT COUNCIL

<u>VACANT SEATS</u>	<u>INCUMBENTS¹</u>	
Obligatory	John R. Greene, Jr./AL/R	
Obligatory	Juan M. Sanchez/FL/C	
Obligatory	Campo E. Matens/LA/R	
At-large	**Harlon H. Pearce/LA/C	
At-large	William S. Perret/MS/O	
<u>STATE</u>	<u>OBLIGATORY NOMINEES</u>	<u>AT-LARGE NOMINEES</u>
Alabama	Randy W. Boggs Joseph G. Dobbs, Jr. *John "Johnny" R. Greene, Jr.	No submission
Florida	*Juan M. Sanchez Robert A. Spaeth Edward O. Walker	No submission
Louisiana	George A. Huye *Campo E. Matens Christopher M. Macaluso Charles C. Trascher	George A. Huye Christopher M. Macaluso Edward W. Swindell, Jr. Charles C. Trascher Billy P. Broussard George A. Huye Charles C. Trascher Bart R. Yakupzack
Mississippi		Dale A. Diaz J. Read Hendon Harvey S. "Sonny" Schindler
Texas		William "Tres" L. Atkins III Ronald "Ronnie" O. Luster Michael W. Jennings Troy B. Williamson II
*Renominated.		
**This member has served three consecutive terms and is ineligible by law to be reappointed.		

¹ Incumbent sector identified as C (commercial), R (recreational), or O (other).

2015 GUBERNATORIAL AND TRIBAL NOMINATIONS TO
THE REGIONAL FISHERY MANAGEMENT COUNCILS

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PACIFIC FISHERY MANAGEMENT COUNCIL

VACANT SEATS

Obligatory
Obligatory
Obligatory
At-large
At-large

INCUMBENTS¹

David M. Crabbe/CA/C
Dorothy M. Lowman/OR/O
**David B. Sones/Tribal/O
William L. Brizendine, II/CA/R
**Dale D. Myer/WA/C

STATE

OBLIGATORY NOMINEES

AT-LARGE NOMINEES

California	William L. Brizendine, II *David M. Crabbe Peter P. Leipzig Peter H. Flournoy	*William L. Brizendine, II David M. Crabbe Peter P. Leipzig Peter H. Flournoy
Idaho		No Submission
Oregon	Walter Chuck Jr. Robert B. Duncan *Dorothy M. Lowman	No Submission
Tribal	James E. Harp Susan M. Masten Melvin E. Moon, Jr. Joseph Y. Oatman Michael W. Orcutt	Not eligible
Washington		Philip M. Anderson Brent C. Paine Douglas H. Fricke

*Renominated.

**This member has served three consecutive terms and is ineligible by law to be reappointed.

¹ Incumbent sector identified as C (commercial), R (recreational), or O (other).

2015 GUBERNATORIAL AND TRIBAL NOMINATIONS TO
THE REGIONAL FISHERY MANAGEMENT COUNCILS

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NORTH PACIFIC FISHERY MANAGEMENT COUNCIL

VACANT SEATS

Obligatory
Obligatory
Obligatory

INCUMBENTS¹

Howard Daniel Hull/AK/C
Robert E. Dersham/AK/R
Craig A. Cross/WA/C

STATE

Alaska

OBLIGATORY NOMINEES

Paul R. Gronholdt
*Howard Daniel Hull
Michael "Buck" Laukitis

Andrew D. Mezirow
Arthur N. Nelson
Richard N. Yamada

Washington

Milton J. Bundy
*Craig A. Cross
Tim A. Henkel

*Renominated.

¹ Incumbent sector identified as C (commercial), R (recreational), or O (other).

2015 GUBERNATORIAL AND TRIBAL NOMINATIONS TO
THE REGIONAL FISHERY MANAGEMENT COUNCILS

On August 10, 2015, 30 terms will expire for 20 obligatory (state-specific) and 10 at-large seats on the eight Regional Fishery Management Councils. Listed below are the Governors' nominations, in alphabetical order, for each seat becoming vacant this year.

Endorsements of nominees may be sent to: Eileen Sobeck, Assistant Administrator for Fisheries, National Marine Fisheries Service, 1315 East-West Highway, Silver Spring, MD 20910. Endorsements may also be emailed to Council.Appointments@noaa.gov. Endorsements will only be officially recorded if they are received in writing. Letters, emails, and faxes will all be accepted. Please submit endorsements as early as possible to ensure the information is considered throughout the decision-making process. Appointments will be announced no later than June 27, 2015.

WESTERN PACIFIC FISHERY MANAGEMENT COUNCIL

VACANT SEATS

Obligatory
Obligatory

INCUMBENTS¹

Michael P. Duenas/GU/C
Michael K. Goto/HI/C

STATE

OBLIGATORY NOMINEES

Guam

James C. Borja
*Michael P. Duenas
Peter Daniel C. Perez

Hawaii

Alton K. Miyasaka
*Michael K. Goto
Edwin N. Watamura

*Renominated.

¹ Incumbent sector identified as C (commercial), R (recreational), or O (other).

STATE OF NORTH CAROLINA
COUNTY OF JONES

BEFORE THE
NORTH CAROLINA MARINE
FISHERIES COMMISSION

IN THE MATTER OF:)
PETITION FOR DECLARATORY RULING BY)
RICHARD ALLYN)
CONCERNING THE APPLICATION OF)
COMMISSION RULE 15A NCAC 03M .0510)
TO AQUACULTURE OPERATIONS)

DECLARATORY RULING

THIS MATTER came before the North Carolina Marine Fisheries Commission (hereinafter the Commission) at its regularly scheduled meeting in Wilmington, North Carolina on February 19, 2015, as a request for a declaratory ruling pursuant to N.C.G.S. §150B-4 by Mr. Richard Allyn on behalf of American Eel Farm (hereafter Petitioner). As described more fully in the Findings of Fact and Conclusions, below, Petitioner seeks a ruling concerning the application of Commission Rule 15A NCAC 03M .0510, as it relates to an aquaculture operation.

The Petitioner and the Division of Marine Fisheries, through its Director, stipulated to the facts presented in Petitioner’s February 12, 2015 Petition for Declaratory Ruling, as supplemented by the Statement of Facts submitted by the Director on February 17, 2015, and the matter was presented to the Commission as a joint request by the Petitioner and the Division. The Fisheries Director presented the joint request to the Commission at its meeting on February 19, 2015. The Commission by proper motion and majority vote granted the Request for Declaratory Ruling, and to proceed to the merits of the applicability of 15A NCAC 03M .0510 to the given state of facts. Upon review of the record documents and stipulated facts, the Commission makes the following:

FINDINGS OF FACT AND CONCLUSIONS

1. Petitioner American Eel Farm, through Mr. Richard Allyn, seeks a declaratory ruling on the issue of whether the current prohibition on the possession of American eels less than nine (9) inches (also known as “glass eels” or “elvers”), as provided in 15A NCAC 03M .0510 and enforced through

Proclamation FF-71-2014 (effective November 28, 2014), applies to an aquaculture facility that is permitted under an Aquaculture Operation Permit issued pursuant to N.C.G.S. §113-169.1 and Commission Rules 15A NCAC 03O .0501, .0502, and .0503(f).

Petitioner's Operation

2. Petitioner proposes to operate an aquaculture facility located at Highway 41, Trenton, Jones County, North Carolina, for the purposes of rearing American eels. The facility includes a building housing 24 self-contained (closed-loop) 1,000 gallon and two 7,500 gallon, automated, self-cleaning and oxygenated holding tanks in which American eels are to be reared until they are sold outside the state of North Carolina, or until the eels reach a size at which they may be legally sold within the State of North Carolina to bait shops, bait brokers or other markets in accordance with applicable state and federal laws and regulations.

3. Petitioner stipulated that it does not intend to possess, buy or sell American eel glass eels collected in the State of North Carolina, including its coastal and inland waters. Petitioner intends to purchase American eel glass eels from sources in the States of Maine and South Carolina or the Maritime Provinces of Canada, where the harvest American eel glass eels is authorized.

4. Petitioner has been issued an Aquaculture Operation Permit annually since 2013, and previously operated under the Commission 2002 Declaratory Ruling until the issuance of Proclamations FF-52-2014 and FF-71-2014, which temporarily suspended and modified the size limitations contained in Rule 15A NCAC 03M .0510.

Previous Commission Declaratory Ruling

5. In 2002 on behalf of North Carolina Eel Farm (now the American Eel Farm), George Koonce and Alexis Blanchard requested a declaratory ruling as to the applicability of the size limitation found in Rule 15A NCAC 03M .0510.

6. Predicated on the 2002 Request for Declaratory Ruling filed by North Carolina Eel Farm (now the American Eel Farm), the Commission issued the following Ruling:

The 15A NCAC 3M .0150 prohibition on possession of American eels less than six (6) inches in length does not apply to an aquaculture facility issued a valid Division of Marine Fisheries aquaculture operation permit for the cultivation or rearing of eels legally harvested outside North Carolina and imported into this State. This Declaratory Ruling does not exempt an aquaculture facility permitted by the Division of Marine Fisheries from complying with the requirements of all other applicable State and federal laws and regulations.

7. Petitioner purchased North Carolina Eel Farm in 2012, renamed the facility the American Eel Farm, and operated the facility pursuant to the Commission's 2002 Declaratory Ruling and an applicable aquaculture operations permit as issued by the Fisheries Director.

American Eel Fishery Management Plan, Addendum III

8. The Commission's 2002 Declaratory Ruling was nullified upon the issuance of Proclamation No. FF-52-2014 on August 26, 2014, which was superseded by Proclamation FF-71-2014, issued on November 25 and effective November 28, 2014.

9. In relevant part, Proclamation FF-71-2014 temporarily suspends Rule 15A NCAC 03M .0510, and modifies its requirements by increasing the size limitation for possession of American eel from six (6) inches to nine (9) inches.

10. Proclamation FF-71-2014 was issued pursuant to Rule 15A NCAC 03M .0512 in order to maintain compliance with Addendum III of the American Eel Fishery Management Plan, which was adopted by the Atlantic States Marine Fisheries Commission and applicable to North Carolina pursuant to N.C. Gen. Stat. §§ 113-252 and 143B-289.51(b)(4), and the North Carolina Interjurisdictional Fisheries Management Plan.

11. On February 19, 2015, the Commission voted to adopt language revising Rule 15A NCAC 03M .0510, in relevant part, by increasing the size limitation for possession of American eel from six (6) inches to nine (9) inches.

Commission's Authority to Regulate Aquaculture Facilities

12. In accord with its authority to regulate aquaculture facilities which cultivate or rear marine resources pursuant to N.C.G.S. §113-132, to issue permits for specialized activities pursuant to

N.C.G.S. §113-169.1, and to regulate the importation and exportation of fish pursuant to N.C.G.S. §113.70, the Commission has adopted regulations establishing an aquaculture operations permit which, in the discretion of the Director, may be conditioned as to species, quantity, size, time or locations (15A NCAC 03O .0501, .0502, and .0503) and has adopted regulations establishing a permit for the importation and transfer of marine and estuarine organisms (15A NCAC 03I .0104).

13. Legally obtained out-of-state stocks of this marine resource, American eels, qualify as “artificially propagated stocks of marine resources” under the rule defining aquaculture operation. 15A NCAC 03I .0101(2)(a)

Based upon the foregoing findings of fact and conclusions, the North Carolina Marine Fisheries Commission makes the following:

DECLARATORY RULING

The prohibition in Rule 15A NCAC 03M .0510 on possession of American eels less than nine (9) inches in length does not apply to an aquaculture facility issued a valid Division of Marine Fisheries Aquaculture Operation Permit for the cultivation or rearing of eels legally harvested outside North Carolina and imported into this State. This Declaratory Ruling does not exempt an aquaculture facility permitted by the Division of Marine Fisheries from complying with the requirements of all applicable State and Federal laws and regulations

This the _____ day of March, 2015



Sammy Corbett, Chairman
Marine Fisheries Commission



**NORTH CAROLINA MARINE FISHERIES COMMISSION
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES**

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March 17, 2015

Ms. Dawn York
Cape Fear River Partnership
617 Surry Street
Wilmington, NC 28401

Dear Cape Fear River Partnership:

On behalf of the N.C. Marine Fisheries Commission, I am writing to thank you for your efforts to restore migratory fish stocks to the Cape Fear River Basin, and to express the Commission's support for the construction of rock weir fish passages at the Cape Fear River Lock and Dams Nos. 2 and 3.

As you know, the Cape Fear River once supported thriving migratory fish populations, including American shad, striped bass and sturgeon. Over the years, development and the construction of dams have blocked or impacted the ability of these migratory fish to travel to the upper reaches of the Cape Fear River to spawn, and has constrained efforts intended to rebuild stock of the various fish. The construction of a rock weir passage at Lock and Dam No. 1 was an excellent first step, but weir passages are also necessary for Lock and Dam Nos. 2 and 3 in order to allow migratory fish to reach historic spawning sites in the upper reaches of the Cape Fear River Basin, such as the Smiley Falls area. The increased size and availability of the spawning habitats is essential to facilitate recovery efforts intended to return the abundance of the resource.

Migratory fish are a valuable public trust resource and provide innumerable benefits to communities surrounding water bodies where they exist. The Commission appreciates your efforts in promoting the need for additional rock weir passages, which is a critical next step in rebuilding these important fish stocks.

Sincerely,

A handwritten signature in cursive script that reads "Sammy Corbett".

Sammy Corbett, Chairman
N.C. Marine Fisheries Commission

cc: Colonel Kevin P. Landers, U.S. Army Corps of Engineers - Wilmington District
Leslie Craig, National Marine Fisheries Service
Secretary Donald van der Vaardt, N.C. Department of Environment and Natural Resources

Colonel Kevin P. Landers
U.S. Army Corps of Engineers - Wilmington District
69 Darlington Avenue
Wilmington, N.C. 28403

Leslie Craig
NOAA Restoration Center
263 13th Avenue South
St Petersburg, FL 33701

Secretary Donald van der Vaardt
N.C. Department of Environment and Natural Resources
1601 Mail Service Center
Raleigh, N.C. 27699-1601



**NORTH CAROLINA MARINE FISHERIES COMMISSION
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES**

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March 26, 2015

The Honorable Pat McCrory
Governor of North Carolina
20301 Mail Service Center
Raleigh, N.C. 27699-0301

Dear Governor McCrory:

I am writing to inform you the N.C. Marine Fisheries Commission endorses allowing our state Marine Patrol inspectors to enter into a joint enforcement agreement with the law enforcement branch of the National Marine Fisheries Service. The Appropriation Act of 2014 (S.L. 2014-100) states the Fisheries Director may enter into such an agreement.

In a joint enforcement agreement, coastal marine enforcement agencies are given federal funds to help enforce federal fisheries regulations within 200 miles of the U.S. coastline known as the Economic Exclusive Zone. In such an agreement, our N.C. Marine Patrol determines annually the type and amount of work to perform and can withdraw from the agreement at any time. Marine Patrol intends to use these funds for supplies, equipment and fuel. The National Marine Fisheries Service anticipates Marine Patrol would receive approximately \$311,000, if the state were to enter into a joint enforcement agreement for the upcoming fiscal year.

The agreement is mutually beneficial both to North Carolina and the National Marine Fisheries Service because state fishery regulations often mirror federal fishery regulations. In effect, N.C. Marine Patrol could be paid for enforcement work they already perform. Additionally, minor fisheries violations that would have been heard in federal court will be handled in our state court system.

The commission respectfully requests you advise the Fisheries Director to enter into a joint enforcement agreement with the National Marine Fisheries Service. Funding allocation decisions will be made by National Marine Fisheries Service by mid-April, so time is of the essence in this matter.

Thank you for your service to North Carolina and your consideration of this request.

Sincerely,

A handwritten signature in cursive script that reads "Sammy Corbett".

Sammy Corbett, Chairman
N.C. Marine Fisheries Commission

cc: DENR Secretary Donald van der Vaart
N.C. General Assembly



**NORTH CAROLINA MARINE FISHERIES COMMISSION
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES**

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March 27, 2015

Mr. Dave Kielmeier
1815 North 20th Street
Morehead City, N.C. 28557

Dear Mr. Kielmeier:

I have been notified that you have pleaded guilty to a fishery resource violation related to oyster limits. Due to this incident, I regret that I have to remove you from the Southern Regional Advisory Committee.

Members of advisory committees for the Marine Fisheries Commission are held to a high standard of conduct in relation to fishing practices. The bylaws of the Marine Fisheries Commission stipulate that advisory committee members will be removed if they are guilty of a significant fishery resource violation.

Please know I appreciate your service to the Marine Fisheries Commission and the state of North Carolina.

Sincerely,

A handwritten signature in cursive script that reads "Sammy Corbett".

Sammy Corbett, Chairman
N.C. Marine Fisheries Commission

cc: Marine Fisheries Commission
Fred Scharf
Pam Morris
Trish Murphey



**NORTH CAROLINA MARINE FISHERIES COMMISSION
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES**

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March 31, 2015

Dear Advisory Committee Leadership:

I am writing to let you know of a reorganization I am implementing for the Marine Fisheries Commission's advisory committees. I am switching from the co-chair structure that we have previously used, to having a chair and vice chair. Organizationally, I think this is a more efficient way to conduct business and I want the committees to be structured more like the commission.

The chair will be responsible for running the meetings and working with the committee staff leads on agenda items. And if the chair is unavailable for a meeting, or has to step away during a meeting, then the vice chair will be responsible for conducting business. I envision the chair and vice-chair working closely together on committee issues.

Following is a list of the assignments I have made:

Northern

Frank Folb - chair, Sara Winslow – vice chair

Southern

Fred Scharf - chair, Pam Morris – vice chair

Habitat and Water Quality

Chuck Laughridge - chair, Mike Wicker – vice chair

Finfish

Sammy Corbett - chair, Mike Wicker – vice chair

Shellfish/Crustacean

Allison Willis - chair, Anna Beckwith – vice chair

Sea Turtle

Bob Lorenz - chair, Adam Tyler – vice chair

If you have any questions about this change, please feel free to call me at 910-620-1804 or email me at samjcorbett3@gmail.com.

Having served on various advisory committees, I know you spend countless hours and drive numerous miles to deliberate in meetings, review materials and provide invaluable advice to the commission. I appreciate the important role you play in assisting the commission with the management of our fishery resources and want to thank you for your dedication and commitment. I look forward to working with you on future fisheries issues and please do not hesitate to contact me if I can be of assistance to you.

Sincerely,

A handwritten signature in black ink that reads "Sammy Corbett".

Sammy Corbett, Chairman
N.C. Marine Fisheries Commission

cc: Committee Staff Leads



**NORTH CAROLINA MARINE FISHERIES COMMISSION
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April 9, 2015

Dear Bay Scallop Fishery Management Plan Advisory Committee:

The Marine Fisheries Commission voted to adopt the Bay Scallop Fishery Management Plan Amendment 2 on Feb. 19, 2015 at its Wilmington business meeting. When a plan is adopted, the management strategies are implemented by proclamation, rule or both. For this plan, the management strategies implemented by rule are scheduled to be effective May 1, 2015.

You can view or download the plan on the Division of Marine Fisheries' website by going to <http://portal.ncdenr.org/web/mf/fmps-under-development>, scrolling down to *Completed FMPs* and selecting the March 2015 *Bay Scallop FMP Amendment 2*. If you have trouble accessing the plan online please contact Michelle Hensley at 252-808-8013 or Michelle.Hensley@ncdenr.gov.

On behalf of the commission and the division, I would like to thank you for your dedication and service in developing the Bay Scallop Fishery Management Plan Amendment 2. You have spent countless hours and driven numerous miles to participate in meetings, review materials and provide invaluable advice. Now, with the adoption of the plan, your advisory committee has completed its mission and is being disbanded. And while your work on this plan is finished, there are still plenty of other fisheries issues that we could use your input on. Please stay involved by attending commission and advisory committee meetings and providing your thoughts on fisheries management.

Sincerely,

A handwritten signature in black ink that reads "Sammy Corbett".

Sammy Corbett, Chairman
N.C. Marine Fisheries Commission

cc: Marine Fisheries Commission
Louis Daniel
Catherine Blum
Plan Development Team



**NORTH CAROLINA MARINE FISHERIES COMMISSION
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES**

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April 9, 2015

Dear River Herring Fishery Management Plan Advisory Committee:

The Marine Fisheries Commission voted to adopt the River Herring Fishery Management Plan Amendment 2 on Feb. 19, 2015 at its Wilmington business meeting. When a plan is adopted, the management strategies are implemented by proclamation, rule or both. For this plan, the management strategies implemented by rule are scheduled to be effective May 1, 2015.

You can view or download the plan on the Division of Marine Fisheries' website by going to <http://portal.ncdenr.org/web/mf/fmps-under-development>, scrolling down to *Completed FMPs* and selecting the March 2015 *River Herring FMP Amendment 2*. If you have trouble accessing the plan online please contact Michelle Hensley at 252-808-8013 or Michelle.Hensley@ncdenr.gov.

On behalf of the commission and the division, I would like to thank you for your dedication and service in developing the River Herring Fishery Management Plan Amendment 2. You have spent countless hours and driven numerous miles to participate in meetings, review materials and provide invaluable advice. Now, with the adoption of the plan, your advisory committee has completed its mission and is being disbanded. And while your work on this plan is finished, there are still plenty of other fisheries issues that we could use your input on. Please stay involved by attending commission and advisory committee meetings and providing your thoughts on fisheries management.

Sincerely,

A handwritten signature in black ink that reads "Sammy Corbett". The signature is written in a cursive, flowing style.

Sammy Corbett, Chairman
N.C. Marine Fisheries Commission

cc: Marine Fisheries Commission
Louis Daniel
Catherine Blum
Plan Development Team



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Harkers Island

April 9, 2015

Dear Shrimp Fishery Management Plan Advisory Committee:

The Marine Fisheries Commission voted to adopt the Shrimp Fishery Management Plan Amendment 1 on Feb. 19, 2015 at its Wilmington business meeting. When a plan is adopted, the management strategies are implemented by proclamation, rule or both. For this plan, the management strategies implemented by rule are scheduled to be effective May 1, 2015.

You can view or download the plan on the Division of Marine Fisheries' website by going to <http://portal.ncdenr.org/web/mf/fmps-under-development>, scrolling down to *Completed FMPs* and selecting the March 2015 *Shrimp FMP Amendment 1*. If you have trouble accessing the plan online please contact Michelle Hensley at 252-808-8013 or Michelle.Hensley@ncdenr.gov.

On behalf of the commission and the division, I would like to thank you for your dedication and service in developing the Shrimp Fishery Management Plan Amendment 1. You have spent countless hours and driven numerous miles to participate in meetings, review materials and provide invaluable advice. Now, with the adoption of the plan, your advisory committee has completed its mission and is being disbanded. And while your work on this plan is finished, there are still plenty of other fisheries issues that we could use your input on. Please stay involved by attending commission and advisory committee meetings and providing your thoughts on fisheries management.

Sincerely,

A handwritten signature in black ink that reads "Sammy Corbett". The signature is written in a cursive, flowing style.

Sammy Corbett, Chairman
N.C. Marine Fisheries Commission

cc: Marine Fisheries Commission
Louis Daniel
Catherine Blum
Plan Development Team

Board of Commissioners
Dan Ingle, Chairman
Eddie Boswell, Vice-Chairman
Linda Massey
David I. Smith
Robert "Bob" Byrd

Alamance County

BOARD OF COMMISSIONERS
124 West Elm Street
Graham, NC 27253-2865

County Manager
Craig F. Honeycutt

County Attorney
Clyde Albright

Clerk to the Board
Tory M. Frink, NCCCC



RESOLUTION ASKING THE NC MARINE FISHERIES COMMISSION (MFC) TO SUPPORT THE NC DIVISION OF MARINE FISHERIES (DMF) USE OF THE SUPPLEMENT PROCESS TO IMPLEMENT REDUCTIONS ON SOUTHERN FLOUNDER

Whereas, all marine creatures are public trust resources owned equally by all citizens of NC regardless of residency; and

Whereas, the southern flounder fishery is a traditional recreational target of thousands of Alamance County residents; and

WHEREAS, the southern flounder population stocks in NC are classified as "depleted"; and

WHEREAS, a recent NCDMF stock assessment as well as the peer reviewers agreed that the stocks are showing no signs of improvement and that harvest of juvenile fish within the population is alarming; and

WHEREAS, the citizens of Alamance County have no representation except through the MFC to manage these public trust resources conservatively and for all citizens; and

WHEREAS, many Alamance County businesses including motels, gas stations, tackle shops, restaurants, and boat dealers provide goods and services to many local citizens as well as traveling fishermen on I-85/40 in the pursuit of southern flounder; and

WHEREAS, there is need for absolute and focused management of these fish to attain, and then maintain, a viable stock of not only southern flounder, but all traditional estuarine fish stocks for our citizenry to enjoy in perpetuity as required by the NC Fishery Reform Act of 1997;

NOW, THEREFORE, BE IT RESOLVED, that the Alamance County Board of Commissioners asks the NC Marine Fisheries Commission to support the NC Division of Marine Fisheries use of the supplement process to implement reduction of southern flounder harvest and that such reductions be made so that the fishery is revived in order to serve all of NC's citizen fishermen and not just ones who fish for profit.

ADOPTED this the 20th day of April, 2015.



Dan Ingle, Chairman
Alamance County Board of Commissioners

ATTEST: 

Tory M. Frink, Clerk to the Board

Board of Commissioners

Robin V. Comer, Chair
Jonathan Robinson, Vice-Chair
Elaine O. Crittenton
Jimmy Farrington
Terry Frank
Mark Mansfield
Bill Smith



County Manager
W. Russell Overman
russello@carteretcountync.gov

Office: (252) 728-8450
Fax: (252) 728-2092

**A RESOLUTION ASKING THE
NC DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES (NCDENR) AND
THE NC MARINE FISHERIES COMMISSION (NCMFC) TO OPPOSE THE NC DIVISION
OF MARINE FISHERIES (NCDFM) USE OF THE SUPPLEMENT PROCESS TO
IMPLEMENT REDUCTIONS OF SOUTHERN FLOUNDER**

WHEREAS, the southern flounder fishery is important to North Carolina counties throughout the coastal area; and

WHEREAS, the southern flounder population has been able to sustain itself at levels allowing substantial harvest for over 30 years, landing millions of pounds annually; and

WHEREAS, the latest southern flounder stock assessment did not pass peer review and has been deemed unable to assess the status of the southern flounder population in North Carolina, and thus the status of the population is unknown; and

WHEREAS, the supplement process allows for limited stakeholder and public input;
and

WHEREAS, when there is need for an amendment, a thoughtful and comprehensive review of any proposed measure to assess the long-term viability of the fishery, it should allow ample opportunity for stakeholder and public input; and

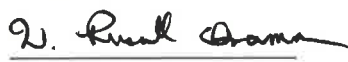
WHEREAS, North Carolina began requiring substantial conservation measures on southern flounder to provide for a sustainable population and viable fisheries in 1979 and has continued to responsibly manage the fishery until the present; and

WHEREAS, effort in the gill net fishery and pound net fishery, the largest fisheries harvesting southern flounder in North Carolina, has been drastically reduced in recent years.

NOW, THEREFORE, BE IT RESOLVED, that the Carteret County Board of Commissioners asks the Secretary of the North Carolina Department of the Environment and Natural Resources and the North Carolina Marine Fisheries Commission to oppose the development of a supplement to the Southern Flounder Fishery Management Plan.

ADOPTED, this day the 20th day of April 2015

Attest:


Russell Overman,
Interim Clerk to the Board


Robin V. Comer, Chairman
Carteret County Board of Commissioners





**A RESOLUTION
ASKING THE NC MARINE FISHERIES COMMISSION (NCMFC)
TO NOT SUPPORT THE NC DIVISION OF MARINE FISHERIES (DCDMF) USE OF THE
SUPPLEMENT PROCESS TO IMPLEMENT REDUCTIONS OF SOUTHERN FLOUNDER**

WHEREAS, the southern flounder fishery is regionally diverse throughout Dare County and statewide with regards to gear, timing of harvest and size of fish harvested; and

WHEREAS, the southern flounder fishery is a \$5.6 million fishery for NC commercial fisherman and the economic impact to the region would be devastating if harvest cuts of 25% to 60% are implemented by NCMFC; and

WHEREAS, Recent NCDMF stock assessment report did not pass peer review and the harvest reduction parameters are arbitrary and subjective and not based on stakeholder input; and

WHEREAS, the supplement process disenfranchises stakeholders because of lack of public input; and

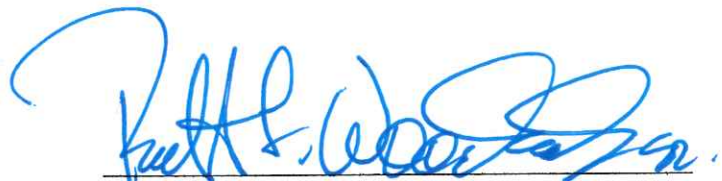
WHEREAS, Dare County's commercial fishermen have already made their investments for the fall 2015 season that will not be able to be recovered, which subjects them to a double economic hit that will be catastrophic for these small businesses; and

WHEREAS, there is need for thoughtful and comprehensive review of any proposed measure to assess the long-term viability of the fishery, and that review must incorporate stakeholder input.

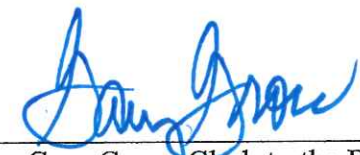
NOW, THEREFORE, BE IT RESOLVED, that the Dare County Board of Commissioners asks the NC Marine Fisheries Commission to not support the NC Division of Marine Fisheries use of the supplement process to implement reductions of southern flounder and that any proposal to limit the fishery be subjected to comprehensive review that includes stakeholder input.

This the 6th day of April, 2015





Robert Woodard, Chairman

Attest: 

Gary Gross, Clerk to the Board

COUNTY OF HYDE

Board of Commissioners

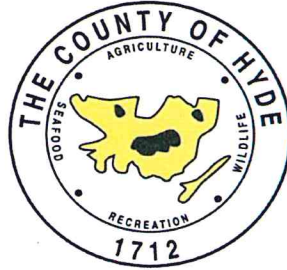
Barry Swindell, Chair
Earl Pugh, Jr., Vice-chair
Ben Simmons
John Fletcher
Dick Tunnell

30 Oyster Creek Road
PO Box 188
SWAN QUARTER, NORTH CAROLINA 27885
252-926-4400
252-926-3701 Fax

Bill Rich
County Manager

Fred Holscher
County Attorney

Lois Stotesberry, CMC, NCCCC
Clerk to the Board



A RESOLUTION ASKING THE NC MARINE FISHERIES COMMISSION (NCMFC) TO NOT SUPPORT THE NC DIVISION OF MARINE FISHERIES (DCDMF) USE OF THE SUPPLEMENT PROCESS TO IMPLEMENT REDUCTIONS OF SOUTHERN FLOUNDER

WHEREAS, the southern flounder fishery is regionally diverse throughout Hyde County and statewide with regards to gear, timing of harvest and size of fish harvested; and,

WHEREAS, the southern flounder fishery is a \$5.6 million fishery for NC commercial fishermen and the economic impact to the region would be devastating if harvest cuts of 25% to 60% are implemented by NCMFC; and,

WHEREAS, recent MCDMF stock assessment report did not pass peer review and the harvest reduction parameters are arbitrary and subjective and not based on stakeholder input; and,


WHEREAS, the supplement process disenfranchises stakeholders because of lack of public input; and,

WHEREAS, Hyde County's commercial fishermen have already made their investments for the fall 2015 season that will not be recovered, which subjects them to a double economic hit that will be catastrophic for these small business; and,

WHEREAS, there is need for thoughtful and comprehensive review of any proposed measure to assess the long-term viability of the fishery, and that review must incorporate stakeholder input.

NOW, THEREFORE, BE IT RESOLVED, that the Hyde County Board of Commissioners asks the NC Marine Fisheries Commission to not support the NC Division of Marine Fisheries use of the supplement process to implement reductions of southern flounder and that any proposal to limit the fishery by subjected to comprehensive review that includes stakeholder input.

This the 6th day of April, 2015.


Barry Swindell, Chairman

ATTEST:


Lois Stotesberry, Clerk to the Board



County of Lenoir

Board of Commissioners

Craig Hill, Chairman
Jackie Brown, Vice-Chairman
Roland Best
J. Mac Daughety
Reuben Davis
Eric Rouse
Linda Rouse Sutton



Lenoir County Courthouse
Post Office Box 3289
130 South Queen Street
Kinston, NC 28502

Telephone: (252) 559-6450
Fax: (252) 559-6454

Michael W. Jarman, County Manager
Tommy Hollowell, Assist. County Manager
Vickie F. King, Clerk to the Board

RESOLUTION ASKING THE NC MARINE FISHERIES COMMISSION (MFC) TO SUPPORT THE NC DIVISION OF MARINE FISHERIES (DMF) USE OF THE SUPPLEMENT PROCESS TO IMPLEMENT REDUCTIONS ON SOUTHERN FLOUNDER

WHEREAS, all marine creatures are public trust resources owned equally by all citizens of NC regardless of residency; and

WHEREAS, the southern flounder fishery is a traditional recreational target of thousands of Lenoir County residents; and

WHEREAS, the southern flounder population stocks in NC are classified as “depleted”; and

WHEREAS, a recent NCDMF stock assessment as well as the peer reviewers agreed that the stocks are showing no signs of improvement and that harvest of juvenile fish within the population is alarming; and

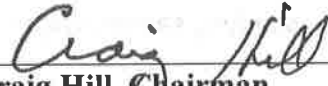
WHEREAS, the citizens of Lenoir County have no representation except through the MFC to manage these public trust resources conservatively and for all citizens; and

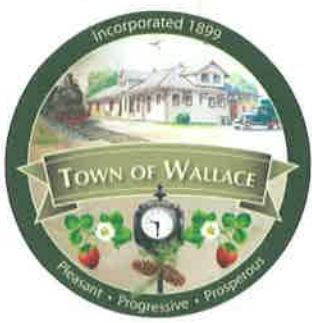
WHEREAS, many Lenoir County businesses including tackles shops, restaurants, and boat dealers provide goods and services to many local citizens as well as traveling fishermen on US 70 in the pursuit of southern flounder; and

WHEREAS, there is need for absolute and focused management of these fish to attain, and then maintain, a viable stock of not only southern flounder, but all traditional estuarine fish stocks for our citizenry to enjoy in perpetuity as required by the NC Fishery Reform Act of 1997.

NOW, THEREFORE, BE IT RESOLVED, that the Lenoir County Board of Commissioners asks the NC Marine Fisheries Commission to support the NC Division of Marine Fisheries use of the supplement process to implement reduction of southern flounder harvest and that such reductions be made so that the fishery is revived in order to serve all of NC’s citizen fishermen and not just ones who fish for profit.

April 20, 2015


Craig Hill, Chairman



Town of Wallace

316 EAST MURRAY STREET • WALLACE, NORTH CAROLINA 28466 • PHONE: 910-285-4136

MAYOR
Charles C. Fariior, Jr.

TOWN MANAGER
Matthew S. Livingston

TOWN COUNCIL
David E. Jordan, Mayor Pro-Tem
Frank Brinkley
William Jeffrey Carter
Greg S. Cave
David Warren Hepler

TOWN CLERK
Jackie Nicholson

TAX COLLECTOR
Kathy B. Hubbard

FINANCE OFFICER
Tracy Chestnutt

TOWN ATTORNEY
Richard L. Burrows

RESOLUTION ASKING THE NC MARINE FISHERIES COMMISSION (MFC) TO SUPPORT THE NC DIVISION OF MARINE FISHERIES (DMF) USE OF THE SUPPLEMENT PROCESS TO IMPLEMENT REDUCTIONS ON SOUTHERN FLOUNDER

WHEREAS, all marine creatures are public trust resources owned equally by all citizens of NC regardless of residency; and

WHEREAS, the southern flounder fishery is a traditional recreational target of Town of Wallace residents; and

WHEREAS, the southern flounder population stocks in NC are classified as "depleted"; and

WHEREAS, a recent NCDMF stock assessment as well as the peer reviewers agreed that the stocks are showing no signs of improvement and that harvest of juvenile fish within the population is alarming; and

WHEREAS, the citizens of the Town of Wallace have no representation except through the MFC to manage these public trust resources conservatively and for all citizens; and

WHEREAS, many Town of Wallace businesses provide goods and services to many local citizens as well as traveling fishermen on interstate 40 in the pursuit of southern flounder; and

WHEREAS, there is need for absolute and focused management of these fish to attain, and then maintain, a viable stock of not only southern flounder, but all traditional estuarine fish stocks for our citizenry to enjoy in perpetuity as required by the NC Fishery Reform Act of 1997.

NOW, THEREFORE, BE IT RESOLVED, that the Town of Wallace Town Council asks the NC Marine Fisheries Commission to support the NC Division of Marine Fisheries use of the supplement process to implement reduction of southern flounder harvest and that such


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FAX: 910-285-5135 • EMAIL: mail@townofwallace.com • WEB: <http://www.townofwallace.com>


The Town of Wallace is an equal opportunity provider and employer.

reductions be made so that the fishery is revived in order to serve all of NC's citizen fishermen and not just ones who fish for profit.

April 23, 2015



Charles C. Farrior, Jr., Mayor



Attest



**NORTH CAROLINA
WAYNE COUNTY**

**A RESOLUTION REQUESTING THE NORTH CAROLINA MARINE FISHERIES COMMISSION TO
SUPPORT THE NORTH CAROLINA DIVISION OF MARINE FISHERIES USE OF THE
SUPPLEMENT PROCESS TO IMPLEMENT REDUCTIONS ON SOUTHERN FLOUNDER**

WHEREAS, all marine creatures are public trust resources owned equally by all citizens of North Carolina regardless of residency; and

WHEREAS, the southern flounder fishery is a traditional recreational target of thousands of Wayne County residents; and

WHEREAS, the southern flounder population stocks in North Carolina are classified as “depleted;” and

WHEREAS, a recent North Carolina Department of Marine Fisheries stock assessment, as well as the peer reviewers, agreed the stocks are showing no signs of improvement and the harvest of juvenile fish within the population is alarming; and

WHEREAS, the citizens of Wayne County have no representation except through the North Carolina Marine Fisheries Commission to manage these public trust resources conservatively and for all citizens; and

WHEREAS, many Wayne County restaurants and other businesses including tackle shops, restaurants and boat dealers provide goods and services to many local citizens as well as traveling fishermen on US Highway 70 in the pursuit of southern flounder; and

WHEREAS, there is need for absolute and focused management of these fish to attain and then maintain a viable stock of not only southern flounder, but all traditional estuarine fish stocks for our citizenry to enjoy in perpetuity as required by the North Carolina Fishery Reform Act of 1997.

NOW, THEREFORE, BE IT RESOLVED that the Wayne County Board of Commissioners requests the North Carolina Marine Fisheries Commission support the North Carolina Division of Marine Fisheries use of the supplement process to implement reduction of southern flounder harvest and that such reductions be made so the fishery is revived in order to serve all of North Carolina’s citizen fishermen and not just ones who fish for profit.

Adopted this the 21st day of April, 2015.



Attest:

Marcia R. Wilson
Marcia R. Wilson, Clerk to the Board

George Wayne Aycock, Jr.
George Wayne Aycock, Jr., Chairman
Wayne County Board of Commissioners

REMINDER

MANDATORY EDUCATION REQUIREMENTS

MANDATORY EDUCATION.

Public Servants and Ethics Liaisons. The State Government Ethics Act *requires* that every public servant and ethics liaison complete an ethics and lobbying education presentation/program approved by the State Ethics Commission *within 6 months* of the person's election, reelection, appointment, or employment **and** complete a refresher ethics presentation *at least every two years thereafter*.

The willful failure of a public servant serving on a board to comply with the education requirements may subject the person to removal from the board. The willful failure of a public servant who is a State employee to comply with the education requirement may be considered a violation of a written work order permitting disciplinary action. Therefore, if there are public servants in your agency or on your covered state board or commission who are past due for completing their ethics education requirements, **those individuals should attend a live presentation, distance video-streamed presentation or complete the online education as soon as possible.**

Legislators. The State Government Ethics Act *requires* that every legislator complete an ethics and lobbying education presentation/program approved by the State Ethics Commission and the Legislative Ethics Committee *within 2 months* of either the convening of the General Assembly to which the legislator is elected or the legislator's appointment, whichever is later, **and** complete a refresher ethics education presentation *at least every two years thereafter*.

The willful failure of a legislator to comply with these education requirements may subject the legislator to sanctions under the Legislative Ethics Act.

Legislative Employees. The State Government Ethics Act *requires* that every legislative employee complete an ethics and lobbying education presentation/program approved by the State Ethics Commission and the Legislative Ethics Committee *within 3 months* of the person's employment **and** complete a refresher ethics education presentation *at least every two years thereafter*.

The willful failure of a legislative employee to comply with these education requirements may subject the person to disciplinary action by their hiring authority.

Legislators and Legislative Employees may check the status of their ethics education by going to the General Assembly intra-net page. Legislators and legislative employees who are past due for completing their ethics education requirements should contact Denise Adams with the Research Division of the General Assembly at denise.adams@ncleg.net or 919-301-1991 to coordinate/schedule their ethics education training.

ETHICS AND LOBBYING EDUCATION TRAINING.

Public Servants and Ethics Liaisons may complete the required basic or refresher ethics and lobbying education training by either attending a live presentation, a distance video streamed presentation or completing the online education modules.

- **Live and Distance Video-Streamed Presentation Dates.** The State Ethics Commission has scheduled live ethics and lobbying education presentations and distance video-streamlined presentations for the remainder of 2014. Dates, locations, and registration information are on the Commission's website at:
www.ethicscommission.nc.gov/education/eduSchedule.aspx.
- **Online Education.** The State Ethics Commission also offers online ethics and lobbying education. The education modules and instructions are on the Commission's website at:
www.ethicscommission.nc.gov/education/eduOnline.aspx.

Legislators may complete the required basic or refresher ethics and lobbying education training by attending a live presentation at the beginning of the legislative session jointly provided by the Ethic Commission and the Research Division of the General Assembly.

Legislative Employees may complete the required basic or refresher ethics and lobbying education training by going online to the General Assembly intra-net page.

REGISTRATION AND QUESTIONS.

- **Public Servants and Ethics Liaisons** please contact Sue Lundberg at (919) 715-2071 or by e-mail at Education.Ethics@doa.nc.gov to register for ethics and lobbying education training or if you have ethics education questions.
- **Legislators and Legislative Employees** please contact the General Assembly ethics hotline at 919-301-1991 or email Denise Adams at denise.adams@ncleg.net if you have questions about the ethics and lobbying education training or have ethics education questions.

Thank you for giving this matter your immediate attention and for sharing this information with all members of your covered board, commission or committee, all staff and employees covered under the State Government Ethics Act, and all legislators and legislative employees.

2015 Meeting Planning Calendar

January						
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| <ul style="list-style-type: none"> MFC ASMFC SAFMC MAFMC State Holiday Sea Turtle AC Meeting Cancelled | <ul style="list-style-type: none"> Southern Regional AC Northern Regional AC Finfish AC Habitat and Water Quality AC Shellfish/Crustacean AC |
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Committee Reports





North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

Donald R. van der Vaart
Secretary

MEMORANDUM

TO: N.C. Marine Fisheries Commission
Northern Regional Advisory Committee

FROM: Holly White
Katy West
Division of Marine Fisheries, NCDENR

DATE: April 28, 2015

SUBJECT: Northern Regional Advisory Committee Meeting

The Northern Regional Advisory Committee met on Thursday, April 9, 2015 at 6 p.m. at the Department of Environment and Natural Resources Washington Regional Office. The following attended:

Advisers: Frank Folb (chair), Riley Williams, Sara Winslow, Gilbert Tripp, Jim Rice, Bill Van Druten, Keith Bruno, Bill Mandulak, Raymond Pugh (Dell Newman and Everett Blake absent)

Staff: Kathy Rawls, Jason Rock, Stephen Taylor, Steve Anthony, Robert Preston, and Holly White

Public: None

Frank Folb called the meeting to order at 6 p.m.

APPROVAL OF AGENDA

Motion by Jim Rice to approve the agenda as written, seconded by Bill Mandulak – motion carries 9-0.

APPROVAL OF MINUTES

Motion by Sara Winslow to approve the minutes as written, seconded by Bill Van Druten – motion carries 9-0.

REVIEW OF THE DRAFT ISSUE PAPER – DETERMINE NEED FOR AND IMPACTS OF SHEEPSHEAD SIZE, CREEL, AND TRIP LIMITS IN NORTH CAROLINA

Stephen Taylor presented the sheepshhead issue paper to the committee. He provided a brief history of the management of sheepshhead, through the South Atlantic Fishery Management Council (SAFMC), the N.C. Marine Fisheries Commission passage of a rule that gives the director proclamation authority to management of sheepshhead and why he was there to present different management options for the committee to consider. Taylor provided information on the life history

of the sheepshead, commercial and recreational landings along the Atlantic coast as well as landings in North Carolina by both sectors of the fishery. He discussed the director's proclamation authority and regulations in other states. He then discussed various reductions for both the recreational fishery and the commercial fishery through size limits, bag limits and trip limits. He then presented various management options for the committee to consider.

Public Comment

There was no public comment.

Proposed Management Options for Sheepshead

There were many comments offered by the Northern Advisory Committee members concerning the purpose of management measures for sheepshead when the division does not have enough data to determine if current sheepshead harvest levels were negatively impacting the sustainability of the stock. Taylor explained that the issue with sheepshead harvest arose from the unlimited recreational bag harvest and increased landings from commercial spearfishing gear, mostly in the southern North Carolina. Staff member Kathy Rawls, explained that sheepshead was managed by the South Atlantic Fishery Management Council as part of the snapper-grouper species complex. Sheepshead was dropped by the council in 2012 from that complex and now individual states could manage them as they see fit.

Jim Rice wanted to know the kinds of information that needed in order to determine if current practices are having a negative impact on the stock. Taylor replied division has a few years of length and age data from independent and dependent sampling, not enough for a stock assessment. Rice suggested the division increase collection of information necessary for a future stock assessment. Sara Winslow agreed with Rice, adding her support to a minimum size limit of 12 inches and allowing at least 50 percent of the juveniles to become sexually mature. Many of the advisers saw a minimum size limit as the only necessary measure with the limited data available and no apparent threat to the stock.

There was agreement that many recreational anglers confuse sheepshead with black drum. It was suggested that a minimum size limit equal to the one in place for black drum could possibly eliminate confusion for anglers. Bill Van Druten commented that the commercial sheepshead harvest peaked during flounder season. Mesh sizes for gillnets and pound nets increase along with effort during the fall months (September, October and November), coinciding with increased landings of sheepshead. Van Druten commented that the closure to commercial gillnets due to protected species interactions and the reduced effort in the long haul fishery would have an impact on the harvest of sheepshead. Frank Folb and Riley Williams were against the implementation of a bag limit, especially as small as 10 fish. If management measures were needed such as a bag limit, Folb suggested a larger limit such as 50 fish, so there is room for reduction.

Motion by Jim Rice to endorse proposed management option A, status quo with no rule changes for management of sheepshead, but charge the division with collecting data necessary to determine trends in the population and to develop a stock assessment, if one is necessary, seconded by Sara Winslow – motion carries 9-0.

MARINE FISHERIES COMMISSION AND DIVISION UPDATES AND OTHER BUSINESS

The advisors asked for additional information on the pending supplement to the Southern Flounder Fishery Management Plan. They were concerned that the Marine Fisheries Commission did not solicit their opinion on the southern flounder stock assessment before proceeding with requests for information on harvest reductions and a supplement to the fishery management plan. Kathy Rawls explained in more detail the actions by the commission from the February meeting concerning southern flounder and what is expected moving forward. Jim Rice stated that it would have been a better use of resources and time if the commission had requested recommendations about southern flounder in addition to sheepshead.

Holly White gave an update on the February 2015 Marine Fisheries Commission business meeting based on the post meeting news release from the division, the status of the for-hire logbook requirement and a supplement to the southern flounder fishery management plan.

The meeting was adjourned by consensus at 8 p.m.

Cc:	Catherine Blum	Jess Hawkins	Gerry Smith
	Mike Bulleri	Jennie Hauser	District Managers
	Scott Conklin	Dee Lupton	Committee Staff Members
	Dick Brame	Jessica Marlies	Marine Patrol Captains
	Louis Daniel	Nancy Marlette	Section Chiefs
	Charlotte Dexter	Jerry Schill	



North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

Donald R. van der Vaart
Secretary

MEMORANDUM

TO: N.C. Marine Fisheries Commission
Southern Regional Advisory Committee

FROM: Trish Murphey
Stephen Taylor
Division of Marine Fisheries, NCDENR

DATE: April 16, 2015

SUBJECT: Southern Regional Advisory Committee Meeting

The Southern Regional Advisory Committee met at 6 p.m., Wednesday April 8, 2015 at the Central District Office, 5285 Highway 70 W, Morehead City. The following attended:

Advisors: Pam Morris, Randy Proctor, Ron McPherson, Bob Lorenz, Fred Scharf, Chris Hunt

Absent: Amy Dickson, Charles Griffin, Phillip Smith, Tom Smith

Staff: Jason Walker, Kurt Woolston, Stephen Taylor, Trish Murphey

Public: Brian Swanson, Jan Willis

Pam Morris, serving as vice-chair, called the meeting to order. A quorum was not present because of highway traffic from a car wreck on Highway 17. Members showed up late and a quorum was present in the end.

MODIFICATIONS TO THE AGENDA

The committee approved the agenda by consensus.

APPROVAL OF MINUTES

Bob Lorenz asked for one sentence on page 3, paragraph 3, line 5, to change "Lorenz" to "Smith." The committee approved the minutes by consensus. Once a quorum was obtained the minutes were approved by voting.

Bob Lorenz made a motion to approve the minutes from the Oct. 8, 2014. Pam Morris seconded the motion. The motion passed unanimously.

REVIEW OF THE DRAFT ISSUE PAPER – DETERMINE NEED FOR AND IMPACTS OF SHEEPSHEAD SIZE, CREEL, AND TRIP LIMITS IN NORTH CAROLINA

Stephen Taylor presented the sheephead issue paper to the committee. He provided a brief history of the management of sheephead, through the South Atlantic Fishery Management Council, the N.C. Marine Fisheries Commission passage of a rule that gives the director proclamation authority to management of sheephead and why he was here to present different management options for the committee to consider. Taylor provided information on the life history of the sheephead, commercial and recreational landings along the Atlantic coast as well as landings in North Carolina by both sectors of the fishery. He discussed the director's proclamation authority and regulations in other states. He then discussed various reductions for both the recreational fishery and the commercial fishery through size limits, bag limits, and trip limits. He then presented various management options for the committee to consider.

Fred Scharf asked about Florida making up most of the Atlantic Coast landings and which gears were used. Taylor explained that cast nets, hook and line, spears and haul seines are used in Florida. Pam Morris commented that the committee had heard a presentation on sheephead once and that the committee had asked that the division come back with additional data. Taylor stated that 2013 data had been added to the paper. He also explained that since the last presentation, the commercial landings by divers with spears had increased from 442 pounds in 2003 to over 10,000 pounds in 2013. Landings numbers are increasing and this is why the division is concerned. We are not able to capture landings by recreational divers with spears, and recreational hook and line has also increased. North Carolina is the only state with no regulations on the books.

PUBLIC COMMENT

Brian Swanson, recreational fisherman from the southern area asked some questions. He asked how recreational data are collected. Taylor described the Marine Recreational Information Program. Swanson then asked about how stock assessments were done. Taylor explained that developing a stock assessment is not an overnight process and that we need to collect more independent data. We are collecting dependent data. Swanson then commented that he was 33-years-old and that sheephead is his favorite fish. He has observed other fishermen fishing that do not know how to target the bigger fish. Most use sand fleas and fiddler crabs. He felt that the data do not represent the population and he did not support a slot limit. He discussed the ease of learning how to fish for sheephead from social media and that the popularity for fishing for sheephead has caught on and the secrets are out.

Randy Proctor asked him what he thought of a 15-fish bag limit. Swanson replied that he was fine with that limit. Lorenz stated that we need to establish some control and to look at some reasonable means. For a recreational bag limit, he asked how difficult it is to have a minimum size but allow one fish to be a trophy fish with a 10-fish bag limit. The group discussed slot limits and made comparisons to the black drum which also has a trophy fish. The group also discussed whether to require trip limits for commercial fishermen. Gill net fishermen should be allowed to keep all sheephead in their catch. Marine Patrol Captain Jason Walker stated that he checks a lot of recreational fishermen but does not see a lot of commercial fishermen with sheephead except for the divers. Taylor explained that the divers, fish at night and move from piling to piling. They are landing 400 or more pounds a night. Trip limits for that sector could be considered. These fish move very little and it is possible to deplete the local population.

Morris commented that for restaurants and consumers, sheepshead has become more popular and with our inability to harvest snappers and groupers, they are looking more toward underutilized fisheries. She stated that commercial harvest is minimal but hopes to have no regulatory discards and continue with a steady supply for consumers.

Lorenz asked about a 200-pound trip limit except for gigs and spears. He assumed pound netters can high grade and we could make an exception for trawls since harvest is small. Scharf commented that there are increases in harvest in the commercial gears for the last five years. Taylor agreed that there is an uptick and it may be due to the popularity of the fish. The group further discussed a recreational 12-inch size limit, 10-fish bag limit, and a slot limit to 20 fish with one trophy fish. They also discussed a 200-pound trip limit but no size limit for the commercial fishery. Proctor commented that it makes sense to have a stock assessment and a size limit. He stated there was no reason not to have a size limit.

Chris Hunt arrived and the committee now had a quorum. The group caught him up on the presentation and the discussion so far.

Hunt explained how he sees divers using SCUBA and free diving with spot lights at night. They tie to pylons and that shooting sheepshead with spotlights is similar to shooting deer. They come up with two and three fish at a time causing depletion in the Wrightsville Beach area. Diving for them has gotten very popular in the last couple of years. They are catching all sizes. He discussed the yield of meat from sheepshead and that you need a 12-inch fish minimum. Ten-inch minimum is ridiculous, he said. He continued describing the diver/spearfishing to the group. Sheepshead is easy to spear and turbidity is not an issue. Giggers are not much of an issue because the head on the sheepshead tears up the gigs. The divers can get up to 200-to 300-pounds a night. Once the water temperature reaches 67° F the fish start moving to the ocean.

Morris suggested that the committee go round the table and see where everyone was. Lorenz explained he preferred a 12-inch size limit for recreational and he did like a slot limit with one trophy fish and a 10-fish creel limit. He saw no purpose of a size limit for the commercial fishery. Proctor liked a 14-inch size limit. Hunt supported a 12-or 14-inch size limit. Proctor commented that he did not want to regulate too much and wanted to curb the gluttony. He would also like to see more data collected. Morris stated that she tended to agree. We have good comments on the spotlighting. She also stated that she does not like regulatory discards and that she also feels that we need to think of the restaurants and the consumers. There is a bigger need for sheepshead because of the increasing regulations on snappers and groupers. She could support a 500-pound trip limit, does not support a size limit and does not support a slot limit. However, she felt she was not qualified to determine limits on the recreational fishery. Ron McPherson commented that he supported a minimum size limit of 12- inches for the recreational fishery and agreed with Lorenz on his position on the commercial fishery. He supported a 10-fish bag limit. Scharf commented that we need to be precautionary and that we do see an increase in one sector that has doubled over the last six or seven years. We can go from underutilized to over-exploited overnight. He stated that if spearfishing is the problem, the director could consider a proclamation to direct that fishery.

Randy Proctor made a motion to recommend a recreational 12-inch FL size limit, 10 fish bag limit, leave the commercial fishery alone, develop a Fishery Management Plan and do a stock

assessment for more information and to ask the Marine Fishery Commission to immediately look at the spotlight/spearfishing issue. Pam Morris seconded the motion.

Bob Lorenz made a motion to amend the main motion to add a 200-pound commercial trip limit. Fred Scharf seconded the motion. The motion failed 2-3, with 1 abstention.

Randy Proctor made a motion to amend the main motion to add a 500-pound commercial trip limit. Fred Scharf seconded the motion. The motion passed 6-0.

Chris Hunt made a motion to amend the main motion to add a 100-pound/vessel trip limit for spearfishing for sheepshead. Randy Proctor seconded the motion. The motion passed 6-0.

The new main motion: Recommend a recreational 12-inch FL size limit, 10-fish bag limit, 500-pound commercial trip limit, with a 100-pound/vessel trip limit for spearfishing sheepshead, develop a fishery management plan and do a stock assessment for more information and to ask the Marine Fisheries Commission to immediately look at the spotlight/spearfishing issue. The motion passed 6-0.

Morris asked to discuss the flounder supplement. She stated that the science is flawed and the stock assessment did not pass peer review. It expedites things with limited public input. Scharf argued that the science is not flawed, but that the stock assessment could not be used for management because you could not use the benchmarks or projections from the assessment. But the empirical data are not flawed. Morris added that this fishery is important to the fishermen and they cannot take any more reductions. Lorenz stated he would like to have a fishery management plan that worked.

Murphey provided an update on the last Marine Fisheries Commission meeting held in Wilmington in February 2015.

Meeting was adjourned.

Cc: Catherine Blum
Mike Bulleri
Scott Conklin
Dick Brame
Louis Daniel
Charlotte Dexter

Jess Hawkins
Brad Knott
Dee Lupton
Nancy Marlette
Lauren Morris
Phillip Reynolds

Jerry Schill
Gerry Smith
District Managers
Committee Staff Members
Marine Patrol Captains
Section Chiefs



North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

Donald R. van der Vaart
Secretary

MEMORANDUM

TO: N.C. Marine Fisheries Commission
Finfish Advisory Committee

FROM: Kathy Rawls
Lee Paramore
Division of Marine Fisheries, NCDENR

DATE: April 30, 2015

SUBJECT: Finfish Advisory Committee Meeting

The Finfish Advisory Committee met on Wednesday, April 15, 2015 at 6 p.m., at the Division of Marine Fisheries Central District Office, 5285 Highway 70 West, Morehead City. The following attended:

Advisers: Sammy Corbett (Marine Fisheries Commission), Mike Wicker (Marine Fisheries Commission), Brent Fulcher, Jerry James, Ken Seigler, Leland Tetterton, Scott Whitley, Sara Winslow, Thomas Brewer, Charlie Renda and Jeff Buckel

Commissioners: Alison Willis, Chuck Laughridge, Joe Shute and Mark Gorges

Staff: Kathy Rawls, Lee Paramore, Stephen Taylor, Nancy Fish, Dr. Louis Daniel and Sergeant Carter Witten

Public: Phillip Reynolds (Marine Fisheries Commission legal counsel), Mike Shutak (Carteret News Times), Jan Willis, Brian Swanson, C.R. Fredrick and Lauren Morris

Sammy Corbett, serving as chair, called the meeting to order.

MODIFICATIONS TO THE AGENDA

There were no modifications to the agenda. The committee agreed that the public would be given the option to comment after the presentation.

Motion by Ken Seigler to approve the meeting agenda. Seconded by Mike Wicker. Motion carries 11-0.

APPROVAL OF MINUTES

Motion by Sara Winslow to approve the July 15, 2014 Finfish Advisory Committee meeting minutes. Seconded by Leland Tetterton. Motion carries 11-0.

PUBLIC COMMENT

There was no initial public comment as members of the public elected to wait until the presentation on sheephead management was given before offering comment.

REVIEW OF THE DRAFT ISSUE PAPER – DETERMINE NEED FOR AND IMPACTS OF SHEEPSHEAD SIZE, CREEL, AND TRIP LIMITS IN NORTH CAROLINA

Stephen Taylor presented the sheephead issue paper to the committee. He provided a brief history of the management of sheephead, through the South Atlantic Fishery Management Council, the N.C. Marine Fisheries Commission passage of a rule that gives the director proclamation authority to manage sheephead and the different management options for the committee to consider. Taylor provided information on the life history of sheephead, commercial and recreational landings along the Atlantic coast as well as landings in North Carolina by both sectors of the fishery. He discussed the director's proclamation authority and regulations in other states. He then discussed various reductions for both the recreational fishery and the commercial fishery through size limits, bag limits, and trip limits. He then presented various management options for the committee to consider.

Committee member Ken Seigler asked what the Northern and Southern Regional advisory committee's recommendations were. Taylor answered that the Northern Regional Advisory Committee supported status quo with no rule changes for management of sheephead, and in addition charge the division with collecting data necessary to determine trends in population and to develop a stock assessment, if one is necessary. The Southern Regional Advisory Committee recommended a recreational 12-inch FL minimum size limit with a 10 fish bag limit and a 500 pound commercial trip limit with a 100 pound/vessel trip limit for spearfishing and in addition to ask the commission to immediately look at the spotlight/spearfishing gear issues.

Committee member Brent Fulcher asked what kind of feedback has been received from New Jersey, Maryland and Virginia since they implemented their management measures. Fulcher was interested if other states were seeing reductions or increases in their stocks in recent years. Taylor indicated he had not discussed this with other states. Fulcher also commented that these regulations seem to target recreational fishermen more than other user groups and that discard mortality would be a concern.

Committee member Dr. Jeff Buckel indicated that he would like to see catch per unit of effort across years rather than just landings information alone. He expressed concern of the increase of smaller fish in the harvest through time. Buckel also indicated that looking at size structure through time could give a better idea of what is actually happening with the stock as a whole. Committee member Sara Winslow commented that we could be seeing regional differences with no real idea what the total stock status might be. Committee member Charlie Renda commented on slot sizes having a negative impact on the overall stock. The committee had additional discussion about the lack of data and the need for additional information in order to make an informed decision or recommendation. The committee had additional discussion about the nighttime spearfishing fishery that is conducted in the southern area. Several members commented on the growing popularity of that fishery and how easy it was to target sheephead in large quantities.

PUBLIC COMMENT ON SHEEPSHEAD MANAGEMENT

Brian Swanson, a recreational fisherman from the southern area referred to comments made by Southern Advisory Committee member (and seafood dealer) Chris Hunt, about spotlighting and

spearfishing, and that those fishermen are making \$2.25 per pound. He pointed out there are only about five to seven guys and they take a lot of sheepshead at any given time. Mr. Swanson indicated that once the light hits them, they freeze and you can literally reach out and grab them. He said that the demand for sheepshead has increased significantly in the Charlotte/Raleigh area in particular and that people come here to (Morehead to Wilmington) and purchase huge amounts of these fish. They are driving these fish to Fayetteville or wherever they need to. He feels that since he has been a fisherman for sheepshead the past 25 years that the stock has diminished. He feels there needs to be a bag limit for the recreational fishery. He stated that the reason there have been less caught by hook- and- line is because they are smart fish, but they cannot avoid a spear and particularly at night.

Lauren Morris, representing the N.C. Fisheries Association, commented that either the fish is worth a fisheries management plan or it is not. If there is a concern, then ask the commission to put it on its Fisheries Management Plan Schedule. If it's not a concern and not that big a deal, then no plan is needed. This kind of short cut is being done more often, just like the southern flounder supplement. If it deserves management measures, and the options being considered are complex and comprehensive, then let the scientists do a plan. Seek assistance through the commission and abide by the process.

Joe Shute, commission member, commented that in the last five years he has seen a big increase in recreational fishing for sheepshead. Tackle shops are now selling bait for targeting sheepshead, whereas this was not available in the past.

The committee had additional discussion about the growing popularity of the sheepshead fishery and inshore fishing in general.

Motion by Leland Tetterton to endorse status quo until more data is available, seconded by Ken Seigler.

The committee had a friendly amendment to the motion and additional discussion about the specific data that it would recommend the commission review before making a final management decision on sheepshead. The following amendment was made to the final motion:

Motion by Jeff Buckel to amend the main motion, and that in addition to status quo, request that the division present catch per unit of effort data from the recreational and commercial fisheries and size structure data through time to the Marine Fisheries Commission before a decision is made on management of sheepshead. Seconded by Scott Whitley. Motion passed unanimously.

Motion by Brent Fulcher to recommend the Marine Fisheries Commission look into the spearfishing fishery removing the larger sheepshead out of the stock and the effect on the stock status. Seconded by Leland Tetterton. Motion passed unanimously.

PUBLIC COMMENT ON OTHER ISSUES

Clarence Frederick, a commercial fisherman from the Swansboro area, commented on size limits and slot limits. He commented that anytime a slot limit is put on a stock, then from a fishing point of view, we should keep the fish we catch. He would like the board to look at catch and release on trout, flounder

and drum. He indicated if management was going to be for all concerned: commercial, recreational and consumer, then we need to look at no discards and keeping what is caught.

OTHER BUSINESS

Committee member Ken Seigler indicated that he has heard from quite a few fishermen talking about closures, large mesh gill nets, etc. and some have been forced out of certain fisheries and forced into the crab pot fishery. He indicated there are a lot of crab pots in the water and that he had asked for pot limits in his southern area in the past. He said he fishes between two inlets and he see's crowding in the waters around him seasonally. He reported that 75 pots are probably the limit for one fisherman to fish in a tide cycle and he is hearing reports of 2000-3000 pots. He said that he personally could only work two to three pots for four days in some of these small areas, and the pots belonging to others are sitting out there with crabs in them, untouched. He said there needs to be a restriction of pots per area, and that if we don't do something about some type of pot restriction in these areas in the next couple of years there is only going to be a six to eight week crabbing season since it is overfished. He said he would like to make a motion to the commission to address this issue.

Committee member Jerry James commented on the number of crab pots in the New River area. Brent Fulcher commented that the high prices currently being paid for crabs is likely driving much of the increased effort. Chairman Corbett commented that in the spring and the fall all of the new crabbers put their pots out and then as the season goes on they realize they cannot pay their fuel bills. He commented that he too has seen an increase in effort. Fulcher recommended talking to the fishermen directly would be a better approach than regulating this issue. He commented that different areas will have different limitations and different solutions to the problem. Charlie Rena indicated that the resource will control the market and that they will not fish if they cannot pay the bills.

Division staff member Kathy Rawls reminded the committee that the N.C. Blue Crab Fishery Management Plan was adopted in 2012 and did not contain pot limits. She commented that the fishery management plan is scheduled for review in 2017.

Motion by Ken Seigler to recommend the Marine Fisheries Commission address the issue of increased effort in the crab pot fishery and recommend pot limits in the smaller waterbodies in the southern area of the state. Seconded by Charlie Renda. Motion failed 2-7, with 2 abstentions.

MARINE FISHERIES COMMISSION AND DIVISION UPDATES

Rawls gave an update on the February 2015 Marine Fisheries Commission business meeting including delayed action on for-hire logbook requirements, supplement to the N.C. Southern Flounder Fishery Management Plan, creation of a Coastal Recreational Fishing License Advisory Committee and a Marine Fisheries Commission Commercial Fishing Resource Committee and an update on the current Marine Fisheries Commission rule package to be effective May 1, 2015.

Chairman Corbett adjourned the meeting.

Cc: Catherine Blum
Mike Bulleri
Scott Conklin
Dick Brame
Louis Daniel
Charlotte Dexter

Jess Hawkins
Brad Knott
Dee Lupton
Nancy Marlette
Lauren Morris
Phillip Reynolds

Jerry Schill
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MEMORANDUM

TO: N.C. Marine Fisheries Commission
Sea Turtle Advisory Committee

FROM: Chris Batsavage
Division of Marine Fisheries, NCDENR

DATE: March 31, 2015

SUBJECT: Sea Turtle Advisory Committee Meeting

The Sea Turtle Advisory Committee met at 6 pm on Thursday, March 19, 2015 at the Department of Environment and Natural Resources Regional Office at 943 Washington Square Mall, Washington, NC. The following attended:

Advisers: Bob Lorenz (Chair), Adam Tyler (Vice Chair), Matthew Godfrey, Craig Harms, Tricia Kimmel, Brent Fulcher, Charles Aycok, Chris Hickman, and Richard Peterson

Absent: Troy Outland

Commissioners: Sammy Corbett

Staff: Nancy Fish, Chris Batsavage, Katy West, Jacob Boyd, Dean Nelson, Garland Yopp, and Michelle Hensley

Public: Shannon Arata

Bob Lorenz, serving as chair, called the meeting to order. He provided some opening remarks and he recognized Marine Fisheries Commission Chairman Sammy Corbett.

MODIFICATIONS TO THE AGENDA

No modifications.

Brent Fulcher motioned to approve the agenda and was seconded by Richard Peterson—motion passes.

APPROVAL OF MINUTES

No minutes for approval since this committee was reinitiated

INTRODUCTIONS OF ADVISERS AND STAFF

Lorenz asked the advisers and division staff to introduce themselves. He also asked the advisers to describe their interest in serving on this committee.

Richard Peterson is retired and lives in Surf City. His interest in protecting sea turtles is why he volunteered to serve as an adviser.

Chris Hickman is a commercial gill netter from Hatteras. He fishes along much of the East Coast and has been involved with protected species issues since the mid-1990s. He is interested in the current sea turtle management process in North Carolina.

Charles Aycock is an attorney from Nags Head and a life-long angler. He looks forward to serving on this committee.

Brent Fulcher owns B&J Seafood in New Bern and Beaufort Inlet Seafood in Beaufort, which support many commercial fishermen. He also served on the last Sea Turtle Advisory Committee.

Tricia Kimmel lives in Greenville and is interested in protected species management. She worked for the Maryland Department of Natural Resources for approximately 10 years on sea turtle and marine mammal strandings and interactions.

Dr. Craig Harms is a veterinarian at North Carolina State University's Center for Marine Sciences and Technology in Morehead City. He does clinical work for sea turtles at the N.C. aquariums, and the Karen Beasley Sea Turtle Hospital in Surf City. In addition, he assists other agencies with research. Dr. Harms also served on the last Sea Turtle Advisory Committee.

Dr. Matthew Godfrey is the sea turtle biologist for the N.C. Wildlife Resources Commission. He served on both of the previous Sea Turtle Advisory Committees.

Adam Tyler is a commercial fisherman from Smyrna. He served on the last Sea Turtle Advisory Committee and wants to see the progress made by that committee to continue.

Bob Lorenz is a recreational fisherman and nature enthusiast from Wilmington. He is pro-small business and therefore supports the commercial fishery. He tries to make recommendations that work best for people and sea turtles. He also served on the last Sea Turtle Advisory Committee as the chairman.

Chris Batsavage is the division's Protected Resources Section Chief and serves as the staff lead for this committee. The Protected Resources Section is responsible for the Observer Program, which monitors protected species interactions in commercial and recreational fisheries.

Jacob Boyd is the Protected Species biologist and works in the division's Protected Resources Section. He oversees the Observer Program and regularly attends the Sea Turtle Advisory Committee meetings to present information and to answer questions.

SEA TURTLE ADVISORY COMMITTEE ORIENTATION

Nancy Fish, the division's Marine Fisheries Commission Liaison, provided an orientation for serving on advisory committees for the Marine Fisheries Commission. Her presentation provided background information on the Fisheries Reform Act, the Marine Fisheries Commission, the Division of Marine Fisheries, the advisory committees, meeting fundamentals, and travel reimbursement information.

Lorenz asked for the adviser's contact information, and Fish replied that the information is on the division's website, and she will forward that information to the committee.

SEA TURTLE INCIDENTAL TAKE PERMIT OVERVIEW

Chris Batsavage presented an overview of the division's sea turtle incidental take permit for the anchored gill net fishery in estuarine waters. The presentation went over the federal Endangered Species Act, explained incidental take permits, provided information on the division's history with incidental take permits for the anchored gill net fishery in estuarine waters, and gave details on the current sea turtle incidental take permit. The purpose of the presentation was to ensure everyone on the committee understood this information since it will serve as a basis for much of the business conducted by this committee.

Fulcher asked Batsavage to explain the importance of the Observer Program and the things the division is doing to ensure the required observer coverage is being met. Batsavage explained that the Observer Program is used to monitor sea turtle takes and that the incidental take permit requires a minimum of 7 percent observer coverage for large mesh gill nets (with a target of 10 percent) and a minimum of 1 percent observer coverage for small mesh gill nets (with a target of 2 percent). He then explained the Estuarine Gill Net Permit that is required to fish anchored gill nets in estuarine waters, which serves as a roster of participants in the fishery that the observers use to set up observer trips. Any non-compliance with the Estuarine Gill Net Permit conditions result in a notice of violation, which suspends the fisherman from participating in the fishery.

Tricia Kimmel asked if fishermen are required to allow observers to observe their fishing operations and Batsavage replied that they are.

Matthew Godfrey asked if recreational gill netters are also required to have an Estuarine Gill Net Permit and if their fishing operations are observed. Batsavage responded that they are required to have the permit and are subject to observer coverage. He also explained that since fishing effort by this sector tends to be more sporadic than the commercial fishery, the observers are more likely to observe a recreational gill net fishing operation via alternative platform trip.

Godfrey followed up to ask if recreational gill netters are bound to the same incidental take permit regulations as the commercial gill netters and Batsavage answered that they are.

Lorenz asked Batsavage to define alternative platform trip for the committee and he explained that they are observer trips made on division-owned boats that observe a gill net operation from a safe distance.

OBSERVER PROGRAM UPDATE

Jacob Boyd gave an overview of the division's Observer Program. He explained the tables provided to the committee that showed the number of trips, protected species interactions, and observer coverage for the different management units and seasons for large and small mesh gill nets. He also explained the difference between onboard and alternative platform trips, information collected on observer trips, and informed the committee that Marine Patrol also conducts alternative platform trips.

Fulcher informed the committee that commercial fishermen opted not to fish for much of the summer in most of the estuarine waters to avoid red drum discards while the season was closed; this made it difficult for the division to conduct observer trips during that time.

Craig Harms asked what kind of information is collected on observer trips and what is that information used for. Boyd replied that data on the animals that were retained and discarded on the trip, the gill net configurations and yardage fished, the soak time of the nets, and the locations fished are recorded on observer trips. This information is often used in fishery management plans and stock assessments. Boyd also noted that the Observer Program is the only source of discard information for the estuarine gill net fishery.

Harms asked if the division would observe the fishery statewide if it was not mandated by the incidental take permit and Boyd said yes. Batsavage explained that the division began observing the gill net fishery beyond the fall Pamlico Sound gill net fishery in 2004 for fishery characterization purposes that are incorporated into fishery management plans and stock assessments.

Godfrey requested updated observer coverage figures once the 2014 commercial gill net trip data is finalized and Boyd said he would provide that at the next meeting.

PUBLIC COMMENT

No public comment

FUTURE MEETING TOPICS AND PLAN AGENDA ITEMS FOR NEXT MEETING

Lorenz explained the information the previous Sea Turtle Advisory Committees discussed to generate discussion on future topics to address. The first Sea Turtle Advisory Committee produced a report that described the gears of concern for sea turtle interactions and he suggested that the advisers read this report. Batsavage reminded the committee of its charge:

- Providing recommendations on reducing sea turtle interactions in commercial and recreational fisheries;
- Reviewing information on sea turtle strandings and interactions; and
- Assisting with public education.

Boyd informed the committee of the signs the division is putting on ocean fishing piers this spring to inform anglers of what to do if they hook a sea turtle. He also informed the committee on a project to observe the recreational hook and line fishery for sea turtle interactions later this spring.

Harms asked for a copy of the sign, and Boyd said he would email it to the committee.

Fulcher provided the committee information on the pre-trip notification system for observing the Atlantic sea scallop fishery, and thinks a call-in system for the division's Observer Program would be beneficial for achieving the required observer coverage. He said this is something the committee should advocate.

Lorenz asked if this would bias observer coverage toward compliant fishermen and Adam Tyler said that it would not because fishermen who did not call-in would get a notice of violation.

Batsavage explained to the committee that this was among the list of initiatives the Marine Fisheries Commission will consider at their May business meeting. The division has collected some background information on observer program pre-trip notification systems in the event the commission decides to pursue this initiative.

Tyler asked if there is a way to verify the information the observers record on an observer trip. Boyd replied that fishermen can request data from their trip, but it is not possible to immediately provide finalized data due to the division's internal data checking process.

Richard Peterson asked if the division could mail the data to the fishermen, and Boyd said we could. Batsavage pointed out that coding criteria used to record the information on the standardized data sheets would be hard for fishermen to understand.

Sammy Corbett interjected that the point Adam Tyler is making is the fishermen do not trust the observers and they would not trust information provided two weeks after their trip. He thinks the observers should write down the information recorded on the trip for the fishermen once they return to shore. He also thinks that this should not take too long to do and it is only fair since observers tend to slow down the normal fishing operation.

Harms asked if staff could provide an example copy of a data sheet for the committee and Boyd said yes. Batsavage said this could be an agenda item for the next meeting to see if a reasonable solution can be reached.

Fulcher said an issue with this topic is the incidental take permit does not require the division to collect information on biological information on non-protected species.

Lorenz asked if the observers are collecting information besides protected species interactions and is that the information of interest to fishermen. Tyler responded that the fishermen are interested in the finfish data as well as the other data. He also stated that fishermen are concerned that the observers have a different mindset than the commercial fishermen and it is possible that they are recording more discards than what actually occurred.

Batsavage said that the committee could discuss the best way to verify data at the next meeting and Lorenz concurred with that idea.

Batsavage also informed the new committee members and reminded the returning members that the collection of biological data on non-protected species has always been a part of observing efforts by the division including the incidental take permits for the fall Pamlico Sound gill net fishery from 2000 to 2010.

Fish informed the committee that an Observer Program video produced by N.C. Sea Grant will be available to watch for their next meeting.

Harms requested that the committee discuss the pros and cons of obtaining incidental take permits for other fisheries that interact with sea turtles at a future meeting. Sea turtle interactions in fisheries without an incidental take permit are illegal.

OTHER BUSINESS

No other business was discussed

MEETING ARRANGEMENTS

The next meeting is scheduled for Thursday June 18, 2015 at the Department of Environment and Natural Resources Regional Office in Washington, NC.

The meeting adjourned at approximately 8:15 pm.

/cb

Cc:	Catherine Blum	Jess Hawkins	Jerry Schill
	Mike Bulleri	Brad Knott	Gerry Smith
	Scott Conklin	Dee Lupton	District Managers
	Dick Brame	Nancy Marlette	Committee Staff Members
	Louis Daniel	Lauren Morris	Marine Patrol Captains
	Charlotte Dexter	Phillip Reynolds	Section Chiefs



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MEMORANDUM

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

FROM: Michelle Duval
Nancy Fish
N.C. Division of Marine Fisheries

DATE: May 2, 2014

SUBJECT: Marine Fisheries Commission Nominating Committee Meeting Minutes

The Nominating Committee met on Wednesday, March 12 at 4 p.m. at the Division of Marine Fisheries Headquarters Office, 3441 Arendell Street, Morehead City, N.C.

The following were in attendance:

Committee members: Chuck Laughridge (Chairman), Joe Shute, Alison Willis
Marine Fisheries Commission members: Sammy Corbett, Mike Wicker (via phone)
Assistant N.C. Attorney General and commission counsel: Phillip Reynolds
Staff: Michelle Duval, Nancy Fish, Chris Batsavage, Patricia Smith
Public: Lauren Morris

Chairman Laughridge called the meeting to order. The agenda was approved without changes.

Chairman Laughridge then reviewed the minutes from the Oct. 1, 2014 committee meeting and asked if there were any modifications to the minutes.

Motion by Alison Willis to approve the minutes from the October 2014 committee meeting. Seconded by Joe Shute. Motion passed unanimously.

Michelle Duval, division staff lead for the committee, briefly reminded the committee of the N.C. General Statutes pertaining to the selection of nominees for federal fishery management council seats. She explained that state statute requires the commission to approve a slate of candidates for consideration by the governor, and allows for the governor to consult with the commission regarding any additions to the list of nominees. N.C. Marine Fisheries Commission Chairman Corbett addressed the committee and explained that the governor's office had contacted him regarding consideration of an additional candidate for inclusion on the list of previously approved candidates for the Mid-Atlantic Fishery Management Council at-large seat.

The committee reviewed and discussed the biography and resume of the potential candidate, and made the following motion:

Motion by Joe Shute to add the name of Mr. Kenneth Cole “Casey” Wagner to the list of Mid-Atlantic Fishery Management Council at-large candidates for consideration by the governor. Seconded by Alison Willis. Motion passed unanimously.

Meeting adjourned.



North Carolina Department of Environment and Natural Resources

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Secretary

MEMORANDUM

TO: N.C. Marine Fisheries Commission
Oyster and Hard Clam Advisory Committee

FROM: Tina Moore
Stephen Taylor
Division of Marine Fisheries, NCDENR

DATE: Feb. 6, 2015

SUBJECT: Oyster and Hard Clam Fishery Management Plan Advisory Committee Meeting

The Oyster and Hard Clam Fishery Management Plan Advisory Committee met Monday, February 2, 2015 at the Department of Environment and Natural Resources Regional Office, 943 Washington Square Mall, Hwy. 17, Washington, N.C. The following attended:

Advisers: Joey Daniels, Bob Cummings, Nancy Edens, Niels Lindquist, Stephen Swanson, Adam Tyler, Lee Setkowsky, Ted Wilgis

Absent: Dell Newman, Ami Wilbur, Jeff Taylor

Staff: Joe Facendola, Garry Wright, Trish Murphey, Dean Nelson, Tina Moore, Stephen Taylor, Clay Caroon, Catherine Blum, Greg Allen, Anne Deaton, Jason Peters, Curtis Weychert, Shannon Jenkins, Jeff Rheubottom, Chuck Weinich

Public: Kenneth Riley, Shane Staples, Alan Saunders

Bob Cummings, serving as chair, called the meeting to order.

MODIFICATIONS TO THE AGENDA

Joey Daniels made a motion to approve the agenda. Niels Lindquist seconded the motion. The motion passed unanimously.

APPROVAL OF MINUTES FROM January 5, 2015

Nancy Edens made a motion to approve the minutes. Adam Tyler seconded the motion. The motion passed unanimously.

PUBLIC COMMENT

Dr. Kenneth Riley from the NOAA Center for Coastal Fisheries and Habitat Research, provided comment from his perspective working with a federal agency on the current issue of SAV and

private shellfish culture. He stated that they are currently working to develop a white paper addressing the interactions of shellfish culture and SAV, and this is viewed as a national issue. They are working with all groups to advance shellfish aquaculture and to help NMFS better interpret what are impacts to SAV from this activity. He hopes that his comments tonight will help keep dialogue open between all parties. He also stated that the aquaculture of clams and oysters has been shown to facilitate SAV growth, and he would like to use science to inform this national dialogue. He expressed that the different types of aquaculture gear have differing impacts to SAV, and DMF should take that into consideration.

Trish Murphey, Fishery Management Plan Co-lead, provided an update on the oyster dredging season. She stated that initial sampling in the Neuse River in January showed oysters to be at 23% legal size, not above the 26% management trigger. However, when re-sampled they were at 29% legal and the area was not closed. This area in the Neuse is currently supporting 7 boats which land between 5 and 10 bushels per trip. The Pamlico River is above the 26% trigger and boats fishing in this area are averaging 7 bushels per trip. The oysters being harvested in the Pamlico area are reported to be of good quality, and fishermen are getting twice the price for them as they were last year. Hyde and Dare counties still remain closed as they are at 22% and 24% legal respectively. They plan on going back out to sample those areas in the coming weeks.

REVIEW OF THE ISSUE PAPER; UTILIZING GPS COORDINATES INSTEAD OF A SURVEY TO DEFINE SHELLFISH LEASE BOUNDARIES

Brian Conrad, plan development team member, presented the background and origination of this issue. Currently applicants are required to provide a professional survey, which may cost \$500 - \$2,000, to receive a shellfish lease. GPS coordinates are currently used by DMF to verify the boundaries of the lease. The Shellfish Growers Association (SGA) brought forward this issue, and requested that DMF waive the professional survey requirements and only require GPS coordinates. The professional survey requirements now in place by DMF are to satisfy statutes set by the NC Department of State Property (NCDSPP) and because of this the Plan Development Team (PDT) recommended proposed management option #1 *Status quo*.

Lindquist asked whether there was an update to include current GPS technology in modern rules, and Conrad said they had been recently updated and include GPS. He explained that the requirement to use a survey comes from the NCDSPP, and that a lack of a survey would violate a general statute. Tyler asked for clarification on the difference between a GIS map and a survey. Conrad explained that the NCDSPP required the survey to protect the public trust, and have a certified legal document. Lindquist asked how good current professional surveys are, and Conrad replied that we do currently send surveys to Geodetic Survey for review. Lindquist then asked what would it cost and take to get DMF staff certified to perform surveys, to which Conrad replied it is expensive, and requires five years to complete. Conrad added that the authority to grant the use of state owned and public trust land is ultimately up to the NCDSPP. Bob Cummings asked if we would have to change NC statutes to not require a survey, and Conrad answered yes. Daniels asked where the public conflicts and issues with using GPS would be. He questioned the rationale of using GPS to prosecute violations when we can't use it for this other user group to establish leases. He stated the survey cost is keeping people out of aquaculture. Cummings asked how accurate is GPS, and Conrad responded, to less than one meter. Ted Wilgis commented, to allow only GPS we would have to change a statute, and that is hard. He asked if there was any way to stay within the rules and reduce the cost to the public,

such as having staff within the division or recommending a cost sharing program. Tina Moore reminded the group that some of the things being discussed are not under statutes for fisheries. Lee Setkowsky asked what type of equipment does a survey use, and Conrad replied sometimes GPS sometimes lines to known monuments. Stephen Swanson commented that we need to update survey methods to reflect modern times. Nancy Edens added that a survey is not necessarily a one-time expense, and their lease had to be re-surveyed many times. Conrad responded that her lease is unique in the state, that is has strong current and is marked with buoys. Edens responded that now having the GPS coordinates makes re-marking her lease so much easier. Wilgis asked whether getting a survey was a stumbling block in the process of getting a lease. Conrad replied that surveyors can be backed up for months, and sometimes they don't even want to take the job. He also added that we go over the requirements with applicants and they know they have 90 days plus an additional 60 days (5 months) to get the survey, and we will also work with people on extensions if the surveyor contacts us with delays. Conrad commented that since 2012 we have not had an applicant terminate the lease application process because of the land survey. Daniels added, when people find out how much it costs for a survey, they don't start the process and more people would have leases if it was more affordable. Wilgis asked if it would be beneficial to have DMF, SGA, and NCDSP meet to see if there is any wiggle room in this policy. Conrad replied that the State Property Office and Geodetic Survey were really holdfast in their position, and doesn't think they will lessen their requirements. Cummings asked if we could just recommend changing DMF requirements to use GPS and force the MFC to look at the statutes. Conrad reminded the group that the requirement is based on being a certified surveyor, not just using GPS. Lindquist asked if we had somebody certified would the State Property Office allow that. Conrad replied, yes the points need to be collected by a certified surveyor. Wilgis asked how we can move forward trying to make it easier for the lease holders, yet still keeping within the State Property Office requirements.

Joey Daniels made a motion to support proposed management option # 2, require DMF to define shellfish lease boundaries with GPS instead of a professional survey for shellfish lease approval standards. Stephen Swanson seconded the motion. The motion passed unanimously.

REVIEW OF THE ISSUE PAPER; THE USE OF POWER HAULING EQUIPMENT IN THE HAND HARVEST OF HARD CLAMS

Joe Facendola, plan co-lead, presented the background and origination of this issue. Currently the use of power hauling equipment is not allowed in hand harvest areas within NC, however a couple of participants in the New River hard clam fishery proposed that it be allowed as is in New York and New Jersey. Facendola reviewed the regulations for hard clam harvest and highlighted how they are primarily designed to protect habitat and other species from clam harvest impacts. Enforcement and management costs and concerns associated with power hauling were also discussed within this issue. Due to the law enforcement, and habitat concerns the PDT recommended management option #1 of *Status quo*. Setkowsky commented that he would personally like to see management option #2 (Amend rules to set conditions allowing for the general use of power hauling equipment) approved, and this issue is to primarily benefit senior citizens who would like to be able to continue to rake clams. Setkowsky then asked if we knew of New Jersey having law enforcement problems with people abusing this gear allowance. Facendola answered he did not have specific examples of citations being issued, but New Jersey

does have specific rules involving power hauling that address the same law enforcement issues discussed. Major Dean Nelson, Marine Patrol Section, added that we currently have issues with people breaking current clam raking rules, and this would afford even more opportunity for people to break the rules. Cummings indicated that it would only be for less than 10 people in deeper water areas and only a few parts of the state, to help people lift the rake off the bottom. Swanson commented on limiting the number of individuals that are bull raking. Lindquist asked if there was any evidence of raking impacting the habitat in the New River, and how deep they were going to use this type of gear. Facendola answered that there is no evidence from the New River however we do limit activities in nursery areas based on other research, and we would not want to have people using hand harvest gear like a mechanical gear in nursery areas. Facendola then added, somebody already having a rope tied to a rake for power hauling, could then pull it behind the boat, having it functionally become a dredge. Cummings commented that it would not be that easy to use a rake like a dredge and that the only a few people would be power hauling in the very deep water of the New River, and possibly in the lower Cape Fear. He also commented on the cost of equipping a boat with the equipment to power haul, and it would keep most people from using this technique. Tyler suggested that we possibly limit this technique to the New River experimentally, as this is the origination of this issue. Cummings added that the issue was brought forth by one elderly individual, and he only has a shellfish license. Nancy Edens asked if this gear would be abused. Facendola responded there is concern for using bigger rakes because there are no size limits on bull rakes. Also since this gear falls within the definition of mechanical gear then people would only be able to use it under a Standard Commercial Fishing License and not under the Shellfish License. Further discussions followed on how to allow power haulers experimentally in a small area in the New River.

Adam Tyler made a motion to allow the use of power haulers with rakes in the New River, with a maximum rake width of 28-inches and following DMF recommended maximum rake weight, and no towing allowance. This gear would be allowed in the New River no further than north of the shrimp line (Grey's Point) and a Shellfish License would be allowed for this gear. Lee Setkowsky seconded the motion. The motion failed 3-4, with 1 abstention.

Stephen Swanson made a motion to support the PDT recommendation of *Status quo*. Ted Wilgis seconded the motion. The motion passed 5-2, with 1 abstention.

REVIEW OF THE ISSUE PAPER: MANAGEMNT OF PUBLIC MECHANICAL CLAM HARVEST

Tina Moore, plan co-lead, covered the history, scope, previous management strategies and rules for mechanical clam harvest. She discussed the northern Core Sound open and closed harvest season, the Pamlico Sound mechanical harvest area in rule that is no longer in use, and the boundaries for the clam mechanical harvest areas across the state. She highlighted declining participation within this fishery. This issue resulted in 11 management options, of which the PDT recommended options #1 *Status quo*, #8 Remove the Pamlico Sound mechanical clam harvest areas no longer in use, and #9 Take latitude/longitude coordinates of the poles marking the open mechanical clam harvest area boundary in the New River. Cummings asked if the committee could recommend more than one option. Moore replied, yes this is a paper encompassed several issues. Lindquist commented that pressure on this fishery is being reduced

by attrition. Moore replied, yes but people can get back into this fishery easily. Edens added that she agreed with the latitude/longitude option for the New River, but asked why mechanical clam harvesters can't be allowed access to clams ahead of maintenance dredging in the ICW. Stephen Taylor responded that in the past we had allowed that to happen in Brunswick County, but participants had to relay them into a proclaimed closed area as the dredged area was polluted. Edens then asked if it would be possible for mechanical harvesters to be able to harvest the clams in open non polluted areas ahead of dredging, as it is a waste of resources. Taylor responded it may be possible if we can get the Army Corps dredging schedule. Anne Deaton responded that the Corps has an annual meeting where they set approximate dates. Taylor added then we would have to coordinate with them. Major Nelson commented that this is already possible by rule, and we just need communication between the parties. He also added that DMF can open any area ahead of dredging as long as it is not in a polluted area. Wilgis asked if the Army Corps puts out a notice to mariners prior to dredging activity. Murphey responded, yes but we can currently open any area to be dredged now through proclamation, but be aware the Corps schedule changes frequently. Wilgis then asked if the issues with the line in the New River were due to habitat concerns. Moore responded that it was only a marking issue.

Stephen Swanson made a motion to support the PDT recommendations of #1, #8, #9, and to recommend allowing mechanical clam harvesters access to clams ahead of maintenance dredging. Ted Wilgis seconded the motion. The motion passed unanimously.

Dean Nelson clarified that rule 3K01 b currently allows for mechanical clam harvest ahead of maintenance dredging, and pointed out the location within MFC rules to Nancy Edens.

REVIEW THE ISSUE PAPER; DEFINING ADVERSE IMPACTS TO SUBMERGED AQUATIC VEGETATION FROM SHELLFISH LEASE AND FRANCHISES

Brian Conrad provided additional information for the issue paper defining adverse impacts to SAV from shellfish lease and franchises that was presented to and tabled by the advisory committee at the Jan 5, 2015 meeting. Conrad outlined the sampling protocols from the 1990's to the present day, stressing that the sampling design was validated by a statistician. He added that the 50 samples per acre design has been in place since 2012 when the nationwide permit was issued by the Army Corps, and is designed to look for shellfish resource presence. Cummings asked how easy it is for somebody to get an individual permit, and Conrad replied that it is a lengthy and expensive process. Daniels commented that nobody has got an individual permit yet in NC, and asked how the sampling design went from 10 to 50 samples per acre. Conrad replied that sampling protocols may not have properly been followed, but the Army Corps issued the permit giving DMF the authority to grant shellfish leases after reviewing the 50 samples per acre protocol. Lindquist added that the regional conditions came from the Federal Government. Daniels stressed that we need to consider what the definition of vegetated means, and suggested that it should not refer to one or two strands of grass but rather a dense covering like an underwater forest as described in the NC Coastal Habitat Protection Plan. Conrad reminded the group that the sampling was designed to assess the presence of existing shellfish resource on a proposed lease, not to look for SAV. Lindquist asked what happens to a lease if SAV shows up on a lease where it was not previously found. Conrad replied that the lease would still be good if SAV recruits to a lease that did not previously have any. Wilgis asked the group how they felt about option #2. Cummings then asked if option #3 was even really an option. Daniels replied

that option #3 would not really help anybody. Conrad then added that under option #2 we would re-evaluate the sampling design and use statistical methods to determine the number of samples required to have this information available to discuss with the Army Corps when Nationwide Permit (NWP) 48 is open for review in upcoming year. Daniels added that we should rely on aerial photography like Virginia and stop ground truthing for SAV. Conrad replied that we have limited funding for any aerial mapping, and flyovers in the Chesapeake Bay occur annually to get accurate maps of SAV. He also added that NC has cut the majority of funding for its mapping program and lost most of its staff, and the current SAV maps are snapshots across many years by different groups. Lindquist asked if in option 2 we would revisit the sampling protocol with the Army Corps and NMFS, and would we be able to do this before 2016. Setkowsky added to Lindquist's question, asking whether the committee's motion to recommend option #2 would be useful when the NWP opens for review. Conrad replied yes. Lindquist commented if the 50 samples were focused on shellfish, perhaps only a subset of 25 could be examined for SAV. Wilgis suggested that as there is much potential for input, we could make a motion to recommend that the Army Corps, NMFS, and Shellfish Growers Association meet with DMF to evaluate sampling protocols. Moore reminded the committee that we cannot make recommendations to impose things on other agencies. Conrad clarified that the intent of option #2 is to evaluate sampling protocols with the input of the other regulatory agencies.

Ted Wilgis made a motion to recommend option #2, to reevaluate the sampling protocol for shellfish lease investigations to ensure that the current sampling density of 50 one meter samples per acre is not excessive. Niels Lindquist seconded the motion. The motion passed unanimously.

OTHER BUSINESS

Wilgis invited any interested individuals present at the meeting to attend the Oyster Summit sponsored by Sea Grant and the Coastal Federation on March 10-11 in Raleigh, NC. He informed the group that all were welcome to attend, registration can be found on-line.

Conrad addressed the chairman and asked permission to revisit the motion to support option #2 regarding the use of GPS and lease boundaries passed by the committee. He was granted permission, and addressed his concern that the option that was presented and recommended by the committee would violate the Regional Conditions of the US Army Corp of Engineers (USACE) Nationwide Permit 48. The committee decided by consensus that they would maintain their decision to recommend option #2.

Setkowsky then asked if there had been any additional information gathered on the origin of the Brunswick County lease moratorium. Tyler related information he had learned from talking with individuals from Brunswick County, and stated that the wild harvest of clams at the time was valuable enough that there was no interest in losing public bottom to private leases. Taylor added that after speaking to one of the last lease holders in Brunswick County, the cost of maintaining the lease and the constant encroachment of the closed polluted lines made it not worth keeping the lease. Setkowsky was satisfied with the information provided, and commented that it appears that there is just not the interest to have leases there.

Wilgis then voiced his concern that the group's previous recommendation regarding the use of GPS may be considered dead in the water by the MFC if goes against statutes under state property. Conrad replied yes they may need another option. Setkowsky asked if they should make a motion to craft another option, because the recommended one required the division to do something illegal. Moore suggested letting the issue sit for the time being, and staff and the Advisory Committee can review the discussions in the minutes. Murphey asked the group to be sure they did not want to craft another option that better reflected the discussions the committee had. Daniels suggested they let the issue sit, and the committee was in consensus to do so. Moore reminded the committee they will have additional time to revisit all of the issues later in the process, and it was not staff intention to go against state statutes.

PLAN AGENDA ITEMS FOR THE NEXT MEETING

Moore reviewed topics for the next meeting to be held March 9. The group has three more meetings to go over the rest of the issues and sections, and will have a full draft document by June. She added that any issues that require rules changes are reviewed by the Rules Advisory Team, and may need to be revisited by the Advisory Committee with modified management options. Moore made the members aware of the future meeting dates are now included at the bottom of the agenda and there are 7 issues and a 2 sections for each species left to address.

Chairman Cummings adjourned the meeting.

/jf

Cc:	Catherine Blum	Jess Hawkins	Gerry Smith
	Mike Bulleri	Jennie Hauser	District Managers
	Scott Conklin	Dee Lupton	Committee Staff Members
	Dick Brame	Jessica Marlies	Marine Patrol Captains
	Louis Daniel	Nancy Marlette	Section Chiefs
	Charlotte Dexter	Jerry Schill	



North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

Donald R. van der Vaart
Secretary

MEMORANDUM

TO: N.C. Marine Fisheries Commission
Oyster and Hard Clam Advisory Committee

FROM: Tina Moore
Stephen Taylor
Division of Marine Fisheries, NCDENR

DATE: Mar. 23, 2015

SUBJECT: Oyster and Hard Clam Fishery Management Plan Advisory Committee Meeting

The Oyster and Hard Clam Fishery Management Plan Advisory Committee met Monday, March 9, 2015 at the Department of Environment and Natural Resources Regional Office, 943 Washington Square Mall, Hwy. 17, Washington, N.C. The following attended:

Advisers: Joey Daniels, Bob Cummings, Nancy Edens, Niels Lindquist, Jeff Taylor, Adam Tyler, Ted Wilgis

Absent: Dell Newman, Ami Wilbur, Stephen Swanson, Lee Setkowsky

Staff: Joe Facendola, Garry Wright, Trish Murphey, Dean Nelson, Tina Moore, Stephen Taylor, Clay Caroon, Catherine Blum, Greg Allen, Anne Deaton, Jason Peters, John Hadley, Curt Weychert, Shane Staples, Chuck Weinich, Steve Murphey

Public: Skip Kemp, Alan Saunders

Bob Cummings, serving as chair, called the meeting to order.

MODIFICATIONS TO THE AGENDA

Jeff Taylor made a motion to approve the agenda. Nancy Edens seconded the motion. The motion passed unanimously.

APPROVAL OF MINUTES FROM February 2, 2015

Nancy Edens made a motion to approve the minutes. Niels Lindquist seconded the motion. The motion passed unanimously.

Trish Murphey, Fishery Management Plan Co-lead, provided an update on the oyster dredging season. There were weather issues to complete the sampling. Sampling in Stumpy Point Bay on February 25th was above the trigger at 26.2%. Sampling off Dare County on March 3rd exceeded

the trigger at 27.9% and will re-open on March 9, 2015 at sunrise. The Neuse River area will continue to be open and the Pamlico River area will continue to be closed to oyster dredging. Effort has been low, based on reports from the public, law enforcement, and dealers.

Tina Moore mentioned the Bay Scallop Fishery Management Plan was approved by the Marine Fisheries Commission at their meeting in February. The next Marine Fisheries Commission will be held in New Bern in May.

PUBLIC COMMENT

There was no public comment.

OVERVIEW OF THE ENVIRONMENTAL FACTORS FOR OYSTERS AND HARD CLAMS

Trish Murphey presented the environmental factors sections for oysters and hard clams. She gave an overview of the habitat, biological stressors, water quality degradation, environmental pathogens, the Coastal Habitat Protection Plan, and research priorities. Bob Cummings asked if anything is done to open permanent closed areas? Steve Murphey responded that development causes the prohibited line to usually move further down the system from non-point sources like stormwater and agricultural runoff. For example, the Newport River, there is a lot of development in the river drainage area and there is not a lot of flushing so it is maintaining its prohibited waters status.

REVIEW OF THE ISSUE PAPER; CORE SOUND SHELLFISH LEASE MORATORIUM

John Hadley, plan development team member, presented the background and origination of this issue. A moratorium on issuing new shellfish leases in Core Sound has existed in some form since 1993. There have been multiple public inquiries to acquire leases in Core Sound, there has been growth in the shellfish aquaculture, there have been changes in human use of Core Sound since 1990's, and Core Sound has some of the best water quality and potential for aquaculture use in the state. Niels Lindquist asked who are asking to acquire new leases? Hadley responded that it has been about 20 requests in the past 3 years from new and old residents of Core Sound. Cummings asked why did people protest leases in this area? Adam Tyler responded that it started with someone asking for a lease on the east side of the sound where most people wanted left alone. Cummings asked if bay scallops count against someone getting a lease? Greg Allen said yes and it is 10 bushels per acre for all total shellfish resources. Lindquist asked if the National Park Service has anything to say on leases too? Hadley responded yes they have a 50 yard buffer from their reserves. Tyler said the east side of the sound is full of submerged aquatic vegetation so leases will likely not be able to go there due to impacts to the sea grasses. Also the Carteret County Fisheries Association met last week and are against lifting the lease moratorium in Core Sound. They fear corporations coming in and buying up areas, like what happened in Florida, and they do not want to deal with poles in the way.

Hadley continued with his presentation. A Human Use Study completed in 2001 used responses from multiple public hearings and workshops to obtain input from Core Sound stakeholders on the optimal use of Core Sound. The Marine Fisheries Commission convened the Core Sound Stakeholder Committee to develop recommendations on shellfish leases in Core Sound based on

the findings from the Human Use Study. Among other recommendations, this committee suggested opening the western side of Core Sound with a one percent cap on leased bottom and to limit new applications to a maximum of 5 acres. In February 2002, the Shellfish Committee reviewed these recommendations and approved them unanimously after making a change to limit the maximum amount of total acreage that one entity could accumulate to no more than 50 total acres. A petition with 500 names was sent to state legislators opposing any new shellfish leases in Core Sound. In 2003 Session Law 2003-64 grandfathered the leases already in Core Sound and banned the issuance of all new leases in Core Sound. Nancy Edens said Pam Morris called her stating her opposition to opening Core Sound to leases. Pam Morris had also called other members of the Advisory Committee too. Daniels said the stakeholder committee was made up of 10 people, they made recommendations which hurt all leases statewide as a result. Daniels requested a list of those who were appointed to the stakeholder committee. Hadley responded that we could provide the list.

Hadley outlined the application process to acquire a new lease and the public comment period that is part of the process. Daniels said if there is a public comment period as part of determining whether to issue a new lease then people can object at that time, rather than limit the entire area to leases. Lindquist asked how many people opposed to a lease is enough to prohibit issuance of a lease and who has the final approval to issue the new lease? Hadley explained that the department secretary makes the final recommendation on issuing the new lease. The application process also requires an open public comment period and posting in a newspaper. Lindquist added that he is not certain whether public comment holds much weight in the final decision to issue a lease, yet public comment seems like a critical step in deciding regionally if a lease will be granted. It is a question of how conflicts are factored into allowing a lease or not.

The Plan Development Team recommended option 2, to open all of Core Sound, with a buffer around Cape Lookout, to shellfish leases per guidelines used in the rest of the state.

Adam Tyler made a motion of status quo, continue the moratorium on new leases in Core Sound. The motion was seconded by Nancy Edens.

Cummings said it seems a shame not to use this area for leases. Tyler said Core Sound is still heavily fished with many gears and there are a lot of duck blinds too. Lindquist asked whether you can have a lease in Primary Nursery Areas? Clay Caroon responded yes, but you can't mechanical harvest. Lindquist said he would like to hear more about how public comment is weighed into the final decision to issue a new lease.

The motion failed 2-3, with 1 abstention.

Jeff Taylor made the motion to support option 2, to open all of Core Sound, with a buffer around Cape Lookout, to shellfish leases per guidelines used in the rest of the state. The motion was seconded by Joey Daniels. The motion did not carry with a vote of 3 to 3.

The Advisory Committee did not provide a recommendation to this issue paper.

RE-VISIT THE ISSUE PAPER; PROTECTION OF SHELLFISH LEASE AND FRANCHISE RIGHTS

Major Dean Nelson, plan development team member, re-visited the issue because two new options were added to the paper for the Advisory Committee to consider. The issue was taken back to the Plan Development Team and they stayed with their original recommendations. We had to discuss further the suspension and revocation options further. Tyler asked if anyone had a license revocation did they get it back after the revocation period. Nelson answered yes people get it back and they don't have to go back through the eligibility pool. Daniels asked if somebody steals from a lease does the owner report to Marine Patrol or the local police department? Nelson responded it would come to marine patrol since it is under marine patrol jurisdiction. Nelson pointed out that if the statute changes are supported as we requested all leases would be covered, felony theft would be added. You could also go to the local police and put a warrant out for them yourself.

Jeff Taylor made motion to accept the Plan Development Team's Recommendation. Joey Daniels seconded the motion. The motion passed unanimously.

REVIEW SHADING REQUIREMENTS

Steve Murphey gave an update to show the requested follow up on shading requirements for shellfish. S. Murphey talked with Bob Cummings to develop the shading language. They discussed two styles for shading: 1. canopy type, or 2. covering the product with light colored fabric or tarp. Once the Marine Fisheries Commission recommends a management strategy, then the Division can put the language into proclamation. Keep it in proclamation so that it has flexibility for the industry. Cummings added that the shading material needs to be something light in color and not prohibitively expensive. White corn sacks are \$0.45 a piece, if you spend more than \$10.00 to shade your clams you have gone all out. S. Murphey mentioned that other states don't define shading.

OTHER BUSINESS

No other business was brought forward.

PLAN AGENDA ITEMS FOR THE NEXT MEETING

Moore reviewed topics for the next meeting to be held April 6. The group has two more meetings to go over the rest of the issues and sections, and will have a full draft document by June if all goes to plan. Moore said that two issues will no longer be pursued through the amendment process. The issue Develop an Aquaculture Seed Transplant Permit to Culture Shellfish from Restricted and Conditionally Approved Waters is going forward and a permit is in development. The issue to Formalize the Policy for Relay of Shellfish to Leases from Closed Areas there are no options, so it is just a means to clarify the policy that is followed.

Chairman Cummings adjourned the meeting.

/tmm

Cc: Catherine Blum
Mike Bulleri

Scott Conklin
Dick Brame

Louis Daniel
Charlotte Dexter

Jess Hawkins
Brad Knott
Dee Lupton
Nancy Marlette

Lauren Morris
Phillip Reynolds
Jerry Schill
Gerry Smith

District Managers
Committee Staff Members
Marine Patrol Captains
Section Chiefs

DRAFT



North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

Donald R. van der Vaart
Secretary

MEMORANDUM

TO: Marine Fisheries Commission

FROM: Wayne Johannessen,
CRFL Project Coordinator

DATE: April 17, 2015

SUBJECT: Coastal Recreational Fishing License Committee Meeting

The Marine Fisheries Commission's Coastal Recreational Fishing License Committee met at the Division of Marine Fisheries headquarters conference room on April 17, 2015. The following attended (*via teleconference):

Committee: Kelly Darden*, Mark Gorges*, Joe Shute, and Louis Daniel

Staff: Dee Lupton, Suzanne Guthrie, Don Hesselman, Nancy Fish, Lindsey Staszak*, Beth Govoni, and Wayne Johannessen

APPROVAL OF AGENDA AND MINUTES

Louis Daniel, Director of the N.C. Division of Marine Fisheries, had to step out of the meeting for a moment and Deputy Director Dee Lupton called the meeting to order and stated meeting purpose is to approve the additional year of funding for 11 projects and to approve the 2015 RFP and called roll.

Wayne Johannessen was introduced as the new Coastal Recreational Fishing License Project Coordinator reporting to Beth Govoni.

The meeting agenda was approved by consensus with no modifications. Joe Shute made motion to accept agenda, Kelly Darden seconded – motion carries.

The minutes from the Dec. 19, 2014 meeting were approved by consensus with no modifications. Mark Gorges made motion to accept minutes, seconded by Joe Shute – motion carries.

Beth Govoni added for the record that the three commissioners met on Feb. 27, 2015 to approve the additional year of funding for the Recreational Fishing Digest. Funding was approved.

PUBLIC COMMENT

There was no public comment offered.

UPDATES

The committee received updates on the Coastal Recreational Fishing license sales report. Don Hesselman commented that the for-hire numbers are incorrect for 2015 due to coding change from calendar year license from date of sale to now being a fiscal year license. The updated numbers will be sent out.

The committee was updated on the status of on-going/previously funded Coastal Recreational Fishing License projects from 2007-2014 with semi-annual progress reports and annual progress reports.

ADDITIONAL-YEAR FUNDING PROJECTS

2010: no projects need additional year of funding for fiscal year 2015 – 2016

2011: no projects need additional year of funding for fiscal year 2015 – 2016

2012: no projects need additional year of funding for fiscal year 2015 – 2016

The committee unanimously approved funding for six 2013 multi-year projects, requesting funding in the amount of \$776,301 for fiscal year 2015 – 2016:

Mark Recapture Study of Cape Fear Striped Bass (2013-F-010) - \$10,035

The Mark Recapture study is a four-year Division of Marine Fisheries project to research the sustainability of the Cape Fear River striped bass population.

Sources of Mortality and Movements of Weakfish (2013-F-011) - \$122,110

Sources of Mortality and Movements of Weakfish is a four-year North Carolina State University project to study factors affecting weakfish stocks.

North Carolina Red Drum Cooperative Tagging Program (2013-F-012) - \$13,000

The N.C. Red Drum Cooperative Tagging Program is a three-year Division of Marine Fisheries project to continue red drum tagging for determining exploitation rates.

Assessing Critical Habitat, Movement Patterns, and Spawning Grounds of Anadromous Fishes in the Tar/Pamlico, Neuse, and Cape Fear Rivers Using Telemetry Techniques (2013-F-013) - \$147,878

This is a three-year project to identify critical spawning habitat, map migration routes and spawning grounds and potentially improve fishery-independent surveys.

FerryMon: N.C. Department of Transportation Based Automated Monitoring (2013-H-006) - \$149,944

FerryMon is a three-year University of North Carolina to continue the long term, continuous water quality monitoring in the Pamlico Sound.

Vandemere Waterfront Park Initiative - \$333,334

Vandemere Waterfront Park Initiative is a three-year grant to purchase property and construct a boating access area in Pamlico County.

Motion by Joe Shute to approve the six 2013 projects requesting funding in fiscal year 2015 - 2016, seconded by Kelly Darden – motion carries.

The committee unanimously approved funding for five 2014 multi-year projects, requesting funding in the amount of \$372,126 for fiscal year 2015 – 2016:

Mortality for Southern Flounder (2014-F-015) - \$136,697

The Mortality for Southern Flounder is a four-year University of North Carolina Wilmington project to provide direct estimates of mortality of Southern Flounder using combined telemetry and conventional tagging.

Carcass Collection Program (2014-F-016) - \$7,750

The Carcass Collection Program is a three-year Division of Marine Fisheries project to establish coast-wide carcass collection program in order to collect data such as length, age and sex for recreationally important fish stock assessment models.

Multi-Species Tagging Program (2014-F-017) - \$106,619

The Multi-Species Tagging Program is a three year Division of Marine Fisheries project to maximize tagging opportunities and optimized cost. The resulting tag-return data will provide independent estimates of *F*, *M*, abundance/biomass, and migration rate and can be combined with traditional catch data to obtain precise and accurate results that improve management.

Stock Structure of Spotted Seatrout (2014-F-022) - \$114,060

The Stock Structure of Spotted Seatrout is a two year North Carolina State University project to collect and use data assess the spatial and seasonal demographic independence of NC's spotted seatrout.

SAV Mapping along Southern NC Coast (2014-H-025) - \$7,000

The SAV Mapping along the southern NC Coast is a two year Division of Marine Fisheries project to map change in submerged aquatic vegetation (SAV) distribution and to provide critical information necessary to manage and protect the habitat for the benefit of SAV dependent fish species, many of recreational importance.

Motion by Mark Gorges to approve the five 2014 projects requesting funding in fiscal year 2015 - 2016, seconded by Joe Shute – motion carries.

REQUEST FOR PROPOSAL

The 2015 - 2016 RFP has been revised; division staff with consultation from Wildlife Resources Commission have reviewed the Coastal Recreational Fishing License request for proposal application and made recommendations to align with the Coastal Recreational Fishing License Strategic Plan.

Director Daniel offered comment for committee's information on a speech given at the Coastal Conference on 4/14/15. The presentation was related to the Coastal Recreational Fishing License grants and program. Addressing the many university professors in attendance in regards to the importance of the Coastal Recreational Fishing License grants and the results of the research that have direct application to priority species and fishery management plans. It was suggested that interest in funding should align with the timeline of the fishery management plan development offering students the opportunity to interact and correspond with the division's plan development teams and to see their data being used for management purposes. This also provides opportunity for the commission to interact and coordinate with the university researchers through Coastal Recreational Fishing License.

Motion by Kelly Darden to approve the 2015 – 2016 RFP, seconded by Joe Shute – motion carries.

ADDITIONAL BUSINESS

Update offered by Nancy Fish that at the last commission meeting it was voted to institute an advisory panel for the Coastal Recreational Fishing License Committee. It will consist of three to five public advisors to offer input and comments at committee meetings. Applications are due by May 1. The advisory panel should be up and running for the fall meeting. Application requests are to be directed to Nancy Fish. Director Daniel asked if there is a requirement of the advisors to have a Coastal Recreational Fishing License. Fish responded that a Coastal Recreational Fishing License was not required, but there is a requirement that one of the advisors be from the for -hire industry. The advisors will also comment on all proposals before the committee, not just the "People" proposals, as done by the former advisory committee. Appointments will be made by the commission chairman in May.

No additional business was discussed.

Meeting adjourned at 10:15 a.m.

Issues/Reports



N.C. FISHERY MANAGEMENT PLANS

May 2015



**TIMELINE FOR OYSTER FISHERY MANAGEMENT PLAN AMENDMENT 4 AND
HARD CLAM FISHERY MANAGEMENT PLAN AMENDMENT 2 (June 2, 2014; Revised March 30, 2015)**

MILESTONES	INTERNAL GUIDELINES	TABLES 1&2 STEP	PROJECTED COMPLETION DATE
1. Orient AC and Discuss Issues, Goal and Objectives	III. B.	9/5	June 2014
2. Present Timeline and Goal and Objectives to MFC; Solicit MFC Input on Issues	III. D.	11/7	August 2014
3. Issue News Release to Solicit Public Input on Issues	III. D.	12-15/8-11	September 2014
4. Draft/Revise and Review Informational Sections and Issue Papers in the FMP and Establish DMF/AC Positions	III. D - F	16-19/12-14	September 2014 -September 2015
5. Obtain MFC Approval for Review of FMP	III. F.	20/15	November 2015
6. Public and Committee Review of FMP	III. F.	21-24/16-18	December 2015-January 2016
7. Present Revised FMP to MFC for Selection of Preferred Management Options	IV. A.	25/20	February 2016
8. Review of FMP by DENR and JLCCGO	IV. A.	26-29/21-24	March 2016
9. Procedural Approval of FMP; Approval of Notice of Text for Rules by MFC	IV. A.	30-32/25-27	May 2016
10. Direct Rules through APA Process	IV. B.	33/28	August-October 2016
11. Final FMP and Rule Approval by MFC	IV. C.	34-35/29-30	November 2016
12. Selected Management Measures Effective Date	N/A	N/A	48 Hours if proclamation; April 1, 2017 if rule

Initial approval by DMF Director: _____ Signature: _____ Date: _____

Presented to MFC: _____ Date: _____

Revision approved by DMF Director: _____ Signature:  Date: 4/27/15

Presented to MFC: _____ Date: _____

Revision(s) and reason(s): Additional time is needed for milestones 4-7 to await the outcome of draft legislation introduced in the 2015 long session that

potentially affects issues in the Oyster and Hard Clam fishery management plan amendments.

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Supplement A to Amendment 1 of the N.C. Southern Flounder Fishery Management Plan
Implement Short-Term Management Measures to Address Stock Concerns

See Sections 5.3, 10.1, 10.1.1 of the 2013 Amendment 1 to the N.C. Southern Flounder Fishery Management Plan

May 4, 2015

Executive Summary

Southern flounder (*Paralichthys lethostigma*) is one of the most economically important estuarine finfish species for commercial and recreational fisheries in North Carolina. Stock assessments completed by the North Carolina Division of Marine Fisheries (NCDMF) in 2004 and 2009 determined the southern flounder stock was overfished and overfishing was occurring throughout the time-series, beginning in 1991. Since the adoption of the Southern Flounder Fishery Management Plan (FMP) in 2005, numerous management actions were put in place intended to end overfishing and rebuild the stock. In 2014, a new stock assessment was completed for southern flounder in North Carolina waters. It was not accepted for management by the NCDMF due to legitimate and substantial concerns raised by the peer reviewers, concerns with which the NCDMF agrees. NCDMF determined the assessment could not be used to define stock status due to mixing of the stock on a regional scale. Without an approved stock assessment it was not possible to determine if the stock is overfished or overfishing is occurring; however, data inputs used in the stock assessment were determined to be valid. It was noted that a high fraction of the harvest consisted of immature fish. Regional data also showed a generally consistent pattern of coast-wide, multi-decadal decline in recruitment and abundance. These concerns prompted the Marine Fisheries Commission (MFC) to pass a motion to pursue a supplement to reduce catch of southern flounder by no less than 25% and no greater than 60%.

The supplement process is a temporary, fast-acting mechanism to address an urgent issue before the usual five-year scheduled review period of a FMP. A supplement is not intended to be a review of all measures that can potentially be used to manage the southern flounder fishery, thus a subset of options was chosen to calculate estimated reductions based on feasibility of implementation in the short-term. Catch reductions provided were based on an average of 2011-2014 commercial and recreational data; however, 2014 harvest data were not finalized, 2014 gill net discards estimates were not available, and 2014 recreational gig data were not available at the time this report was developed. Catch was defined as the number of southern flounder harvested and estimated dead discards. Catch reductions are only estimates that include many assumptions about harvest, discards and population dynamics.

Catch reductions were estimated for five proposed management options to reduce annual catch and increase escapement of southern flounder: (1) implement a season closure, (2) increase the minimum size limit, (3) decrease the recreational bag limit, (4) implement a season closure and also increase the minimum size limit, (5) implement a season closure, increase the minimum size limit and decrease the recreational bag limit. The first option is a season closure, which allows

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for more escapement of southern flounder, assuming harvest is not recouped and discards do not increase substantially. Season closures at the end of the season will have different impacts geographically and for each gear. Estimates indicated a season closure for the total fishery (commercial and recreational) will need to begin Oct. 16 for a 25% reduction and begin Sept. 1 for a 60% reduction. To achieve approximately the same reduction between sectors, the recreational fishery will require a much longer season closure than the commercial fishery because the peak catch occurs earlier in the season. The second option, an increase in the size limit, will allow harvest to continue throughout the current season and also increase escapement. Commercial gear modifications will be important to help mitigate expected discard increases. Estimated reductions from increasing the minimum size limit to 15 or 16 inches for the total fishery are 14% and 28%, respectively. The third option, decreasing the recreational bag limit, was estimated to not achieve at least the minimum requested catch reduction. The fourth option, combining a season closure with an increase in the minimum size limit, will reduce total fishery catch by an estimated 25% with a season closure starting Nov. 1 and a 15-inch minimum size limit. The fifth option includes a season closure, an increase in the minimum size limit and a decrease in the recreational bag limit. To achieve an estimated 25% reduction with a minimum size limit of 15 inches and a one-fish recreational bag limit, a season closure for the total fishery of Nov. 16-May 15 will be needed. Catch reductions for Options 2, 4 and 5 (those with a size limit increase) do not include further reductions that would be expected from an increase in gill net and pound net escape panel mesh sizes. Determining reductions levels and methods that are equitable within the requested range among sectors, gears, and geographic regions will be difficult due to the nature of the southern flounder fishery.

Some portions of the approach and conclusions discussed in this supplement differ from previous NCDMF management documents for southern flounder. Since there is not an approved stock assessment to determine sustainable harvest levels, any level of reduction selected can only be based on the degree of concern about the current state of the southern flounder stock as understood by data trends. Regardless of the reduction level and management measures chosen, it will be difficult to determine if the estimated catch reductions are actually achieved due to current data limitations (i.e., uncertainty about discards). In previous documents developed by the NCDMF for southern flounder fishery management, reductions from new measures were based on harvest rather than catch (although discards were included in stock assessments). Catch reductions are considerably lower than harvest reductions for most options due to expected discards. Harvest reduction estimates required fewer assumptions, but do not take discards into account. Lastly, due to evidence the stock is mixing on a regional scale, it should be understood that southern flounder fishery trends in other South Atlantic states will impact the likelihood of achieving estimated reductions due to management measures used in N.C. waters.

The draft supplement will be presented to the MFC at its May 20-22 business meeting, at which time, the MFC has three options: reject the draft supplement (ending the process), approve the draft supplement as presented for public comment, or modify the draft supplement and approve the modified version for public comment. If the process continues, the draft supplement will be available at an announced time for public comment. All public comments received will be provided to the MFC for its Aug. 19-21 business meeting, at which time, the MFC will select its preferred management option. Selection of the preferred management option is final approval of the supplement. If the supplement is approved, management measures would be implemented by proclamation and would likely be effective Sept. 1.

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I. ISSUE AND ORIGINATION

At the Feb. 19, 2015 MFC business meeting, the MFC passed a motion to pursue a supplement to reduce catch of southern flounder by no less than 25% and no greater than 60%. This motion was based on discussions by the MFC that the purpose of reducing catch was to increase overall escapement of southern flounder.

II. BACKGROUND

Management History

The original N.C. Southern Flounder FMP, adopted in 2005, set overfishing and overfished thresholds and targets using a spawning potential ratio (SPR) of 20% and 25%, and implemented management measures intended to end overfishing and rebuild the stock. Management actions were developed to expand spawning stock biomass while allowing for sustainable harvest. Through the FMP, several steps were taken to better manage southern flounder for a sustainable harvest including a 14-inch minimum size limit for commercial and recreational fisheries statewide and an eight-fish recreational bag limit for the recreational fishery as recommended by the NCDMF and adopted by the MFC in February 2005 to enable a greater percent of southern flounder to spawn at least once. Other measures implemented with the adoption of the 2005 FMP included a December commercial closure period, prohibiting the use of gill nets with a mesh length of 5.0 to 5.5 inches from April 15 – Dec. 15, establishing a 3,000-yard limit for gill nets with a mesh length of five inches or greater statewide, requiring 5.5-inch escapement panels in pound nets statewide, and a four-inch minimum tail bag requirement for crab trawls in western Pamlico Sound.

The 2009 N.C. Southern Flounder Stock Assessment (Takade-Heumacher and Batsavage 2009) proposed increasing the threshold SPR from 20% to 30% and increasing the target SPR from 25% to 35% to reduce the risk of recruitment overfishing. The assessment results indicated that under these new reference points the stock in North Carolina was overfished and overfishing had been occurring throughout the entire time series (1991-2007). While the stock assessment indicated the stock status was improving with decreases in fishing mortality, increases in spawning stock biomass, and expansion of age classes, a reduction in the overall harvest was still needed to achieve sustainable harvest. Thus, the NCDMF began developing Southern Flounder FMP Amendment 1 in 2010. During the development of Amendment 1, the NCDMF reached a settlement agreement concerning sea turtle interactions in the commercial gill net fishery which enacted management measures on May 15, 2010 to reduce these interactions (Proclamation M-8-2010). Upon analysis of these measures, it appeared they would result in the necessary harvest reduction (22.2%) to end overfishing in two years and achieve sustainable harvest in the commercial fishery. In November 2010, the MFC approved sending the draft of Amendment 1 to the Southern Flounder FMP to the Department of Environment and Natural Resources (DENR) Secretary and Joint Legislative Commission on Seafood and Aquaculture for review. Delays in the review of Amendment 1 caused by the legislative schedule resulted in the NCDMF requesting approval to begin the supplement process in January 2011 so management measures could be implemented in the recreational fishery to end overfishing and achieve sustainable

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harvest. For the required reductions to the commercial fishery, the approach was to wait and assess the impacts to harvest from measures implemented in 2010 for large mesh gill nets in conjunction with the settlement agreement.

In February 2011, the MFC adopted Supplement A to the Southern Flounder FMP to implement recreational harvest restrictions due to the delay in legislative review of Amendment 1. Supplement A to the 2005 Southern Flounder FMP implemented a 15-inch minimum size limit statewide and six-fish recreational bag limit for the recreational fishery (Proclamation FF-29-2011). In February 2013, Amendment 1 to the Southern Flounder FMP was adopted by the MFC. Amendment 1 established the threshold SPR of 25% and the target SPR of 35% and implemented management measures for the commercial and recreational fisheries. For the recreational fishery, the management measures established in Supplement A were incorporated into Amendment 1 (a coast-wide 15-inch minimum size limit and a six-fish recreational bag limit). For the commercial fishery, some of the measures intended to reduce sea turtle interactions were adopted as management measures for southern flounder. These included limiting the number of fishing days each week and establishing maximum yardage limits for gill nets with a mesh size from 4.0 through 6.5 inches stretch mesh (NCDMF 2013).

In December 2014, the NCDMF completed a new stock assessment. The 2014 assessment used the same type of model as the 2009 assessment (i.e., catch-at-age model), but used a new computer program with new and updated data and accounted for new research related to reproductive ecology. Upon review of the 2014 assessment, the external peer reviewers and the NCDMF determined the model could not fully account for stock mixing during spawning and quantify migration of southern flounder to and from North Carolina waters. Sustainability benchmarks could not be developed for southern flounder using the statistical catch-at-age model used in the 2014 Southern Flounder Stock Assessment. Subsequently, the 2014 Southern Flounder Stock Assessment was not accepted for management use by the NCDMF due to legitimate and substantial concerns raised by the external peer reviewers, concerns with which the NCDMF agreed. The fact the stock assessment was not accepted provides no answer as to whether the 2005 threshold and target or the more risk adverse threshold and target from Amendment 1 (2013) were appropriate or met.

Stock Concerns

The NCDMF cannot quantify levels of sustainable harvest without a valid stock assessment; however, certain patterns in the southern flounder fishery and population are concerning and may warrant management action. Many of the data inputs for the stock assessment were considered valid by peer-reviewers for use in analyzing trends. A pattern that was noted in the first southern flounder stock assessment (NCDMF 2005) is the high fraction of immature fish in the harvest. Based on the recent maturity schedule published by Midway et al. (2013) and the catch-at-length data from commercial and recreational fisheries, 46%-73% of southern flounder harvested in North Carolina waters were below the length at 50% maturity (L50; Figure 1). This provides an estimate of immature fish in the harvest, although some fish above the L50 are immature and some below the L50 are mature. This proportion has decreased only slightly since 2005, despite increases in the minimum size limit.

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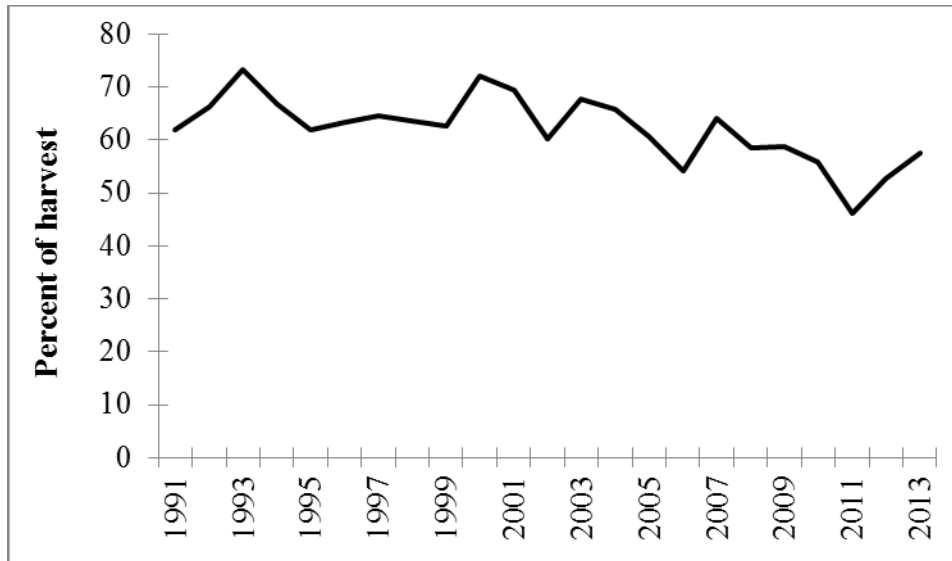


Figure 1. Percent of the annual harvest less than the length at 50% maturity (L50) for southern flounder. The L50 was approximated at 400 mm (15.8 inches) total length for this analysis. Note: all harvest, including sublegal harvest, except recreational gig harvest was included in this analysis.

Based on genetic, otolith morphometric, and tagging data, southern flounder appear to form a single South Atlantic population, from North Carolina to Florida (Anderson and Karel 2012; Anderson et al. 2012; Midway et al. 2014; Craig et al. *In review*; Wang et al. *In press*). As such, population trends in different states are likely coupled via spawning, recruitment, and migration. Therefore, it may be appropriate to consider population trends from other South Atlantic states as indicators of what may be occurring with the overall southern flounder population in the South Atlantic, including North Carolina waters. Indices of abundance from North Carolina, South Carolina, and Georgia, derived from fishery-independent surveys in state waters and analyzed by their respective marine fisheries management agencies, show a generally consistent pattern of coast-wide, multi-decadal decline in recruitment and general abundance of sub-adults and adults (Figures 2 and 3). While some uncertainty in the magnitude or timing of population decline exists, none of the seven indices were interpreted as indicative of improving population status.

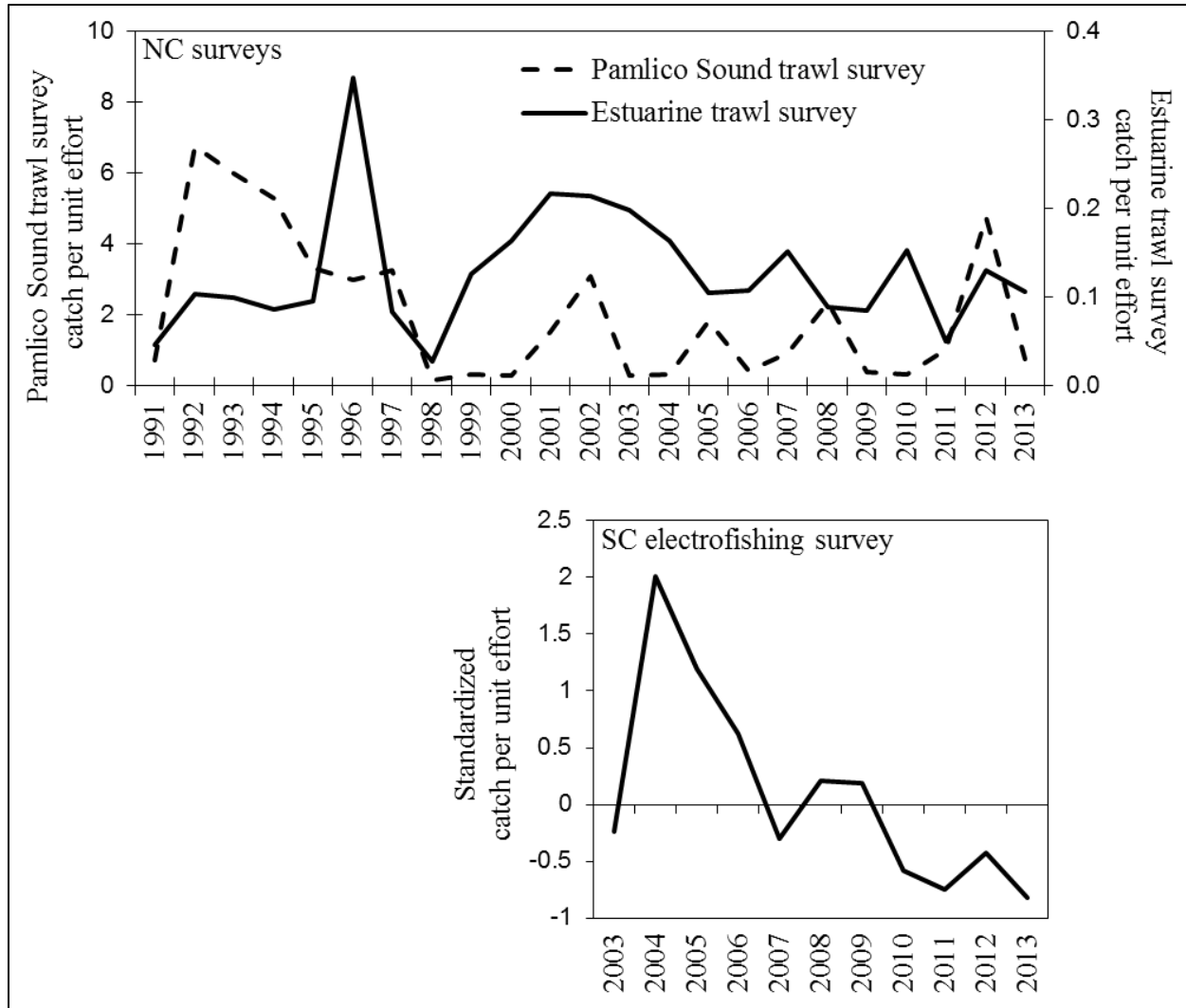


Figure 2. Indices of juvenile abundance developed from North Carolina Pamlico Sound and Estuarine Trawl Surveys and South Carolina Electrofishing Survey. North Carolina indices were developed by North Carolina Division of Marine Fisheries and the South Carolina index was developed by South Carolina Department of Natural Resources.

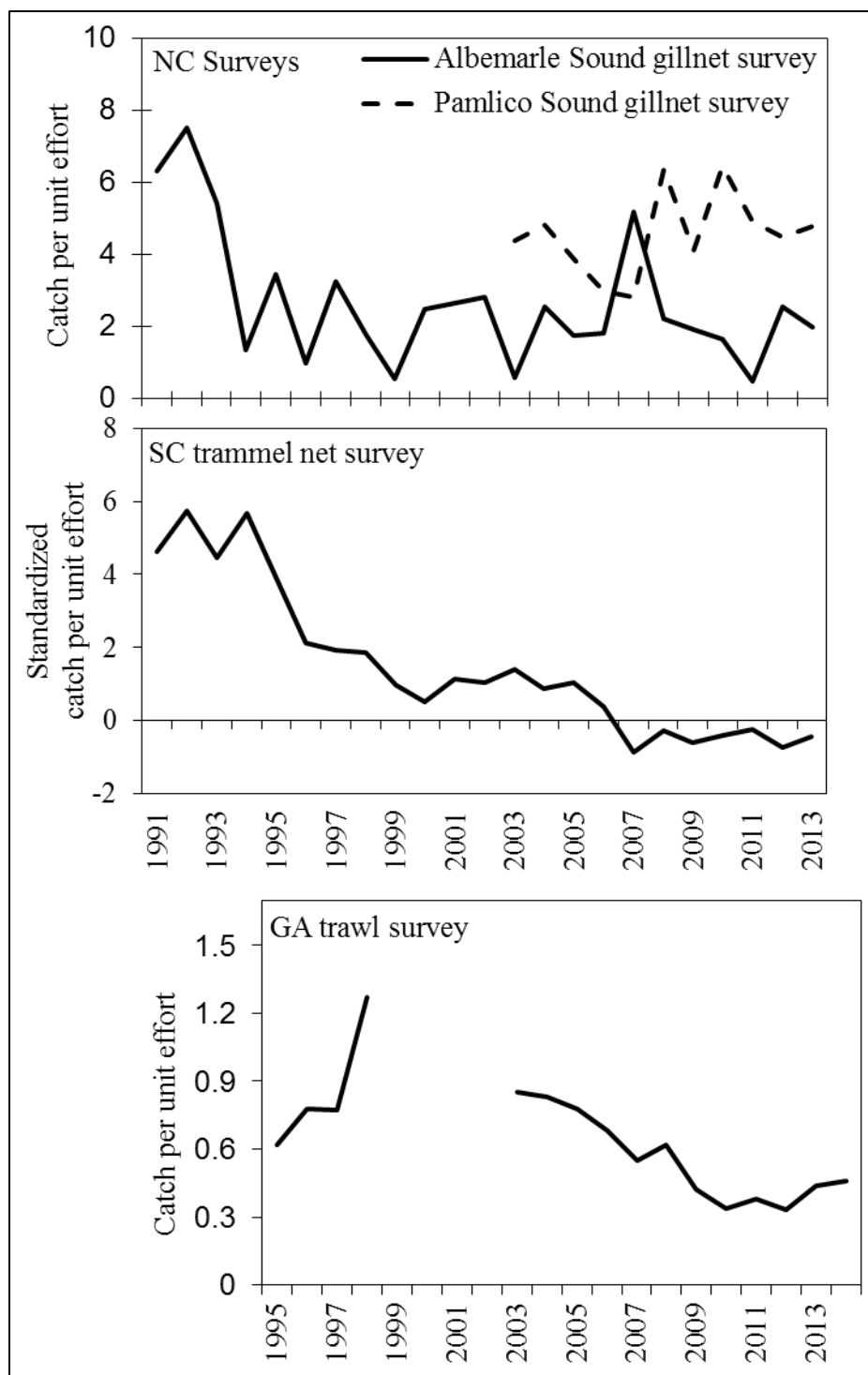


Figure 3. Indices of abundance of sub-adults and adults developed from North Carolina Albemarle Sound and Pamlico Sound Independent Gill Net Surveys, South Carolina Trammel Net Survey, and Georgia Ecological Monitoring Survey (GA Trawl). North Carolina indices were developed by NCDMF staff; the South Carolina index was developed by South Carolina Department of Natural Resources staff; and the Georgia index was developed by Georgia Department of Natural Resources staff.

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A regional stock assessment is needed to account for migration and mixing throughout the South Atlantic and to quantify the offshore component of the southern flounder stock. However, pursuing a regional stock assessment would change the current management unit of the fishery and would not be appropriate for a supplement (based on long-term viability and urgency), as it constitutes a wholesale change in management strategy that would require an amendment to the FMP. For the purpose of this supplement and consistent with Amendment 1, the current management unit is defined as southern flounder in all coastal and joint waters throughout North Carolina.

Supplement Process

N.C. General Statute 113-182.1 and the MFC FMP Guidelines (NCMFC 2010) provide a supplement mechanism to modify a plan between the usual five-year scheduled reviews when the Secretary of the DENR determines an issue is in the interest of the long-term viability of the fishery and the urgency of the issue makes it impossible to address it through the FMP amendment process. The draft supplement must contain analysis of the proposed management change including pertinent data with projected outcomes, and proposed rules or proclamation measures necessary to implement that position. Supplement management measures are temporary (interim) and must be incorporated into the FMP at the time of the next review (currently scheduled for 2018) or they expire on the date the revised FMP is adopted. Also, the MFC may only consider a single management issue for each draft supplement. For Supplement A, the single management issue is to reduce catch in order to improve escapement. Uncertainty over whether the stock is overfished or overfishing is occurring, concerns that immature fish make up a large portion of the catch, and coast-wide indices of abundance that have declined since the 1990s support the urgency of the issue.

Characterization of the Fishery

Recreational

Most of the recreational harvest of southern flounder occurs inshore in North Carolina's estuaries and coastal rivers; however, the ocean harvest near reefs is an important component of the recreational hook and line fishery. The hook and line fishery occurs year-round but the majority of the harvest is during summer months. Data from the National Marine Fisheries Service's Marine Recreational Information Program (MRIP) were used to estimate hook and line harvest because that is the primary gear intercepted by MRIP creel clerks. In 2012, the Marine Recreational Fishing Statistics Survey (MRFSS) was replaced by MRIP to improve the methodology used to generate recreational estimates of catch and effort. Hook and line anglers harvested approximately 79% of the known recreational harvest and 17% of the total recreational and commercial harvest (Table 1). The recreational gig fishery harvests less southern flounder but harvests them more consistently throughout the year than the hook and line fishery, typically peaking in late-summer and early-fall. Because MRIP rarely intercepts fishermen using gigs (due to fishing at night), the NCDMF began a mail-based survey of recreational gigging in 2010. Based on responses to the mail-based survey and the number of Coastal Recreational Fishing

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License (CRFL) holders, the NCDMF estimated the harvest and trips taken by the recreational gig fishery in North Carolina. Recreational gigs accounted for 21% of the known recreational harvest and 5% of the total harvest. In 2011-2013, recreational anglers and giggers together averaged 495,685 trips and 459,177 pounds of southern flounder annually (Table 1), with the majority of the harvest occurring in the southeastern part of the state from Onslow through Brunswick counties.

Table 1. Average annual effort and landings for the North Carolina recreational southern flounder fishery from 2011-2013. Recreational gig harvest data were not available for 2014, so 2014 was excluded from the average presented in this table.

Gear	Trips	Pounds	% of Recreational harvest	% of Total harvest
Gig	24,477	96,748	21.1	4.5
Hook and Line	471,208	362,429	78.9	16.9
Total	495,685	459,177	100.0	21.4

Additionally, Recreational Commercial Gear License (RCGL) holders are allowed to use limited amounts of commercial gears such as gill nets, trawls, pots, and seines. Recreational Commercial Gear License holders are not allowed to sell their catch and must abide by the same size and creel limits as all recreational anglers. Due to the discontinuation of the survey used to estimate RCGL-holder harvest, the amount of southern flounder caught by RCGL holders is unknown, but is assumed to be small based on RCGL harvest in the last years of the survey. On average, RCGL holders made 18,296 trips (all gears) and landed 68,826 pounds of southern flounder annually from 2002-2007. Roughly 73% of the southern flounder landed by RCGL gear was landed by gill nets.

The recreational hook and line fishery harvest of southern flounder peaked in 2010 (Figure 4). Harvest generally increased after the 2005 Southern Flounder FMP, but generally declined since 2011 when Supplement A implemented a 15-inch minimum size limit and six-fish bag limit for the recreational fishery. However, inshore recreational harvest was extremely variable since 2008, suggesting other factors besides regulations are influencing harvest levels. The recreational ocean harvest of southern flounder steadily decreased since the 2005 Southern Flounder FMP was implemented; however because regulations did not become stricter in ocean waters in 2005 the reason for this is unclear (Figure 4). Preliminary 2014 data indicates the lowest recreational southern flounder hook and line harvest since 1999. Due to the short amount of time data were collected from the recreational gig fishery (since May 2010), trends in harvest by this fishery are not clear.

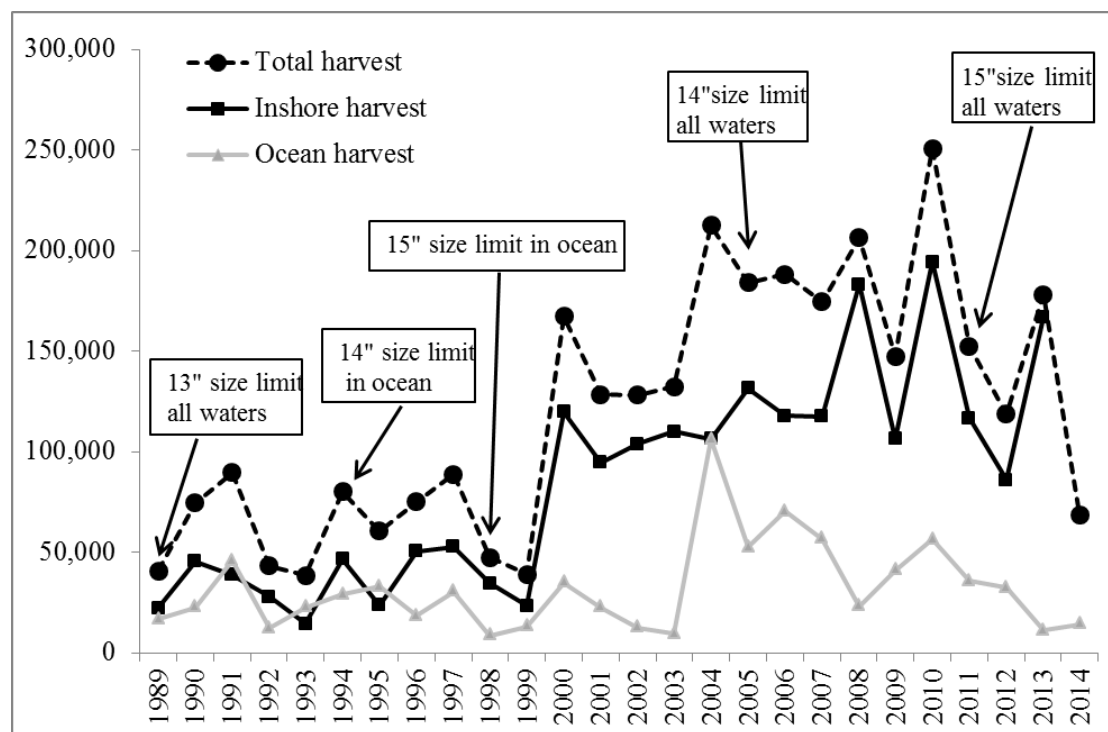


Figure 4. Recreational hook and line harvest from MRIP data 1989-2014 (2014 data are preliminary) and major fishery regulation changes.

Commercial

Commercially, southern flounder are harvested by pound nets, gill nets, gigs, and various other commercial gears such as shrimp trawls, crab trawls, seines, and crab pots. The majority of the commercial harvest occurs by gill nets and flounder pound nets, although the harvest by gigs has increased in recent years. Approximately 70% of North Carolina’s commercial landings came from the Albemarle and Pamlico sounds in 2011-2013. Data from the North Carolina Trip Ticket Program (NCTTP) were used to estimate the harvest, trips, participants, dealers and ex-vessel value for the commercial fishery (Table 2). The NCTTP considers all flounder caught in inshore waters as southern flounder and all flounder caught in the ocean as summer flounder; as such, only flounder caught inshore were considered for commercial harvest. The NCTTP defines large mesh gill nets as \geq five inches and small mesh gill nets as $<$ five inches stretched mesh. Small mesh gill nets accounted for a relatively small portion (approximately 6%) of landings in the commercial southern flounder gill net fishery. The large mesh gill net fishery operates year-round, but most of the southern flounder harvest occurred in May-November, peaking in October in 2011-2013. Gill nets are used in most estuarine waters where regulations allow. Gill nets accounted for roughly 55% of the commercial harvest and 43% of the total recreational and commercial fishery harvest. Flounder pound nets are used mainly in eastern portions of the estuaries and are currently not used south of Beaufort Inlet. Southern flounder harvest by pound nets occurs almost exclusively in September-November when fish are migrating toward ocean inlets. Pound nets accounted for 36% of the commercial harvest and 29% of the total harvest. Commercial gigs accounted for 8% of the commercial harvest and 6% of the total harvest, with

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other commercial gears accounting for just less than 1% of each category, respectively. On average, there were 20,069 commercial trips landing 1,689,645 pounds of southern flounder annually with an ex-vessel value of \$4,283,451 in 2011-2013. A variety of regulations have been put in place via proclamation or rule for the commercial and recreational fisheries that target flounder species (Appendix 1).

Table 2. Average effort, participants, and landings for the North Carolina commercial southern flounder fishery from 2011-2013. Commercial value data were not available for 2014, so 2014 was excluded from the average presented in this table.

Gear	Trips	Participants	Dealers	Ex-vessel value	Pounds	% of commercial harvest	% of total harvest
Gill Net	14,638	854	165	\$2,305,055	932,792	55.2	43.4
Pound Net	1,649	75	34	\$1,621,415	614,899	36.4	28.6
Gig	2,503	258	100	\$322,605	127,413	7.5	5.9
Other	1,282	282	98	\$34,377	14,541	0.9	0.7
Total	20,069	1,175	237	\$4,283,451	1,689,645	100.0	78.6

The commercial fishery harvest of southern flounder peaked in 1994 (Figure 5). Harvest by gill nets peaked in 1998, whereas harvest by pound nets peaked in 1993. Regulations implemented by the 2005 Southern Flounder FMP appear to not have impacted commercial landings, which increased until 2009 before decreasing in 2010 and 2011 and increasing again in 2012-2014. Analysis of commercial landings by area suggests lower availability of southern flounder in the Albemarle Sound Management Area (ASMA; where much of southern flounder harvest occurs), rather than regulations was the main reason for the decline in statewide harvest in 2010 and 2011. This is further supported by reductions across multiple gears in the ASMA in 2010-2011 and substantial increases in harvest in 2013.

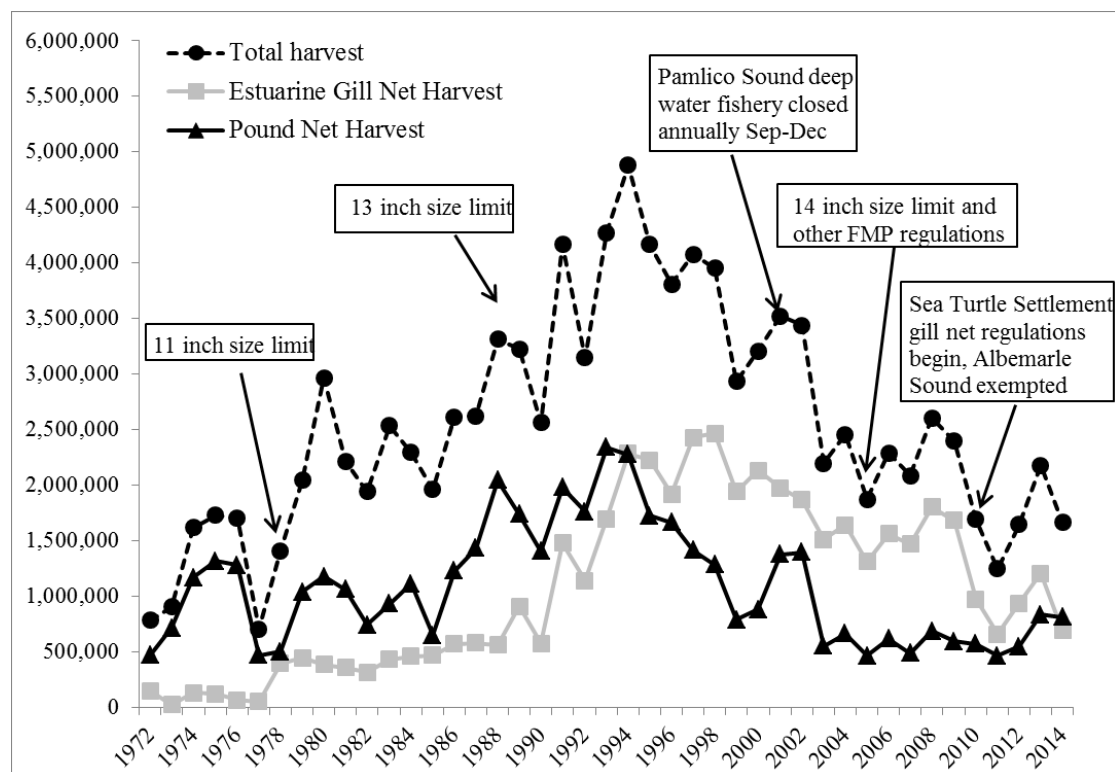


Figure 5. Commercial landings (lbs) from NCTTP 1972-2014 (2014 data are preliminary) and major fishery regulation changes

III. AUTHORITY

North Carolina General Statutes

- 113-134. Rules.
- 113-182. Regulation of fishing and fisheries.
- 113-182.1. Fishery Management Plans.
- 113-201. Legislative findings and declaration of policy; authority of Marine Fisheries Commission.
- 113-221.1. Proclamations; emergency review.
- 143B-289.52. Marine Fisheries Commission – powers and duties.

North Carolina Marine Fisheries Commission Rules (15A NCAC)

- 03M .0503 Flounder

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IV. DISCUSSION

The discussion below includes management alternatives that were discussed by the Southern Flounder Plan Development Team as methods for achieving the reductions requested by the MFC. Because a supplement is not intended to be a review of all measures that can potentially be used to manage the southern flounder fishery, a subset of options was chosen to calculate estimated reductions based on feasibility and likelihood of being implemented in the short-term. Other potentially viable options for long-term management requiring further review by the NCDMF and stakeholders would be appropriate to be addressed in an amendment to the Southern Flounder FMP.

Management Measures Not Analyzed For Requested Reductions

Total Allowable Catch (TAC) and Quota implementation

Permits are required for any seafood dealer who wishes to participate in fisheries managed under a quota due to the need to know the level of compliance in reporting. As part of the permitting conditions under the dealer quota monitoring rule (15A NCAC 03O .0503(b)), seafood dealers are required to report their landings by noon daily for the previous day's landings (including zero landings) as long as the fishery remains open. Seafood dealers can report their daily landings via email, fax, or phone. Managing southern flounder under a quota would be difficult using this current process. For instance, in 2014, there were 231 seafood dealers reporting landings of southern flounder. This is more than double the current number of dealers who hold quota monitoring permits for other species and would require additional staff to enter quota monitoring logs, verify these logs, monitor compliance, summarize data and conduct analysis. In addition, the southern flounder fishery is unique when compared to other quota monitored species in the state because it occurs January-November from the North Carolina/Virginia border to the South Carolina/North Carolina border. This would require staff to monitor the quota and, more importantly, track compliance for landing reports for the entire open season throughout the state.

An advantage and possible option the NCDMF has when it comes to implementing a quota on a species such as southern flounder is the use of electronic reporting. Due to the nature of the southern flounder fishery (occurring most of the year, covering nearly all estuarine waters, large number of seafood dealers), tracking the quota via logs is inefficient. A more efficient method would be for seafood dealers to submit their southern flounder landings with the NCDMF Trip Ticket software program. This would allow access to landings data for southern flounder directly from the trip ticket database as opposed to the quota monitoring database and would not require data entry. In 2014, 86% of southern flounder trip ticket landings were reported using the software program. From a quota monitoring standpoint, 86% of the landings may be adequate to determine the status of the quota. Although the majority of the landings were reported with the software, only 31% of seafood dealers landing southern flounder reported with the software. One issue to overcome with monitoring a southern flounder quota using the software program is the NCDMF cannot legally require landings to be submitted more frequently than once a month. A request for the authority to require trip ticket reports be submitted at less

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than monthly intervals has been submitted to the N.C. General Assembly, but to date, no bill has been introduced to implement this change.

Managing the southern flounder fishery via a quota or TAC would be better accomplished through the amendment process because statute and rule changes and additional staff would be required prior to implementation. If considered in an amendment, the NCDMF would be able to investigate a combination of the trip ticket reporting requirements (monthly reporting) with the permit quota monitoring requirements (gear and effort information) to address obstacles to implementing a quota. The public would also have the opportunity to provide ample input. Methods to effectively determine the level of use and correlation of electronic reporting to the overall harvest, taking into account NCDMF resource limitations could be evaluated. Since a supplement is to be implemented quickly and remain in place until the time of the next adoption of the FMP, a quota is not a viable option for consideration at this time. This issue could be further explored in an amendment.

Maximum size limit

A maximum size limit is typically used to protect large, mature fish from harvest, thereby increasing the spawning stock biomass. In the Southern Flounder FMP Amendment 1, a maximum size limit was considered. If used in combination with a minimum size limit, this effectively serves as a slot limit. At that time, a 24-inch maximum size limit was used to explore this idea. The findings were that in 1991-2007, approximately 0.3% of flounder in the commercial fishery and 2.3% in the recreational fishery were harvested above 24 inches. In 2011-2014, approximately 0.1% of flounder in the commercial fishery and 0.6% in the recreational fishery were harvested above 24 inches. Therefore, to reduce harvest substantially the maximum size would need to be considerably lower than 24 inches. Approximately 87% of harvest occurs between 14 and 18 inches and 93% occurs between 14 and 20 inches. A maximum size limit would increase discards due to fish caught and discarded above the maximum size. To reduce discards in the commercial fishery due to the minimum size limit, minimum mesh sizes for gill nets and pound net escape panels are currently in place; however it is unlikely a minimum mesh size chosen to reduce catch below a minimum size limit would also reduce catch above a maximum size limit. Therefore, discards in the commercial fishery would increase for fish above the maximum size limit. In the recreational hook and line fishery, fish above the maximum size would also continue to be caught, thus increasing discards. Due to the small number of large fish caught and the likelihood of increased discards, a maximum size limit was not recommended by the NCDMF or the MFC in the past as a method of reducing harvest. Because the largest flounder are often the most valuable to the commercial fishery, and most sought after by the recreational fishery, there would likely be an economic impact to this measure. Lastly, growth of southern flounder is quite variable and although larger fish are more likely to be mature females, some mature at 14-15 inches. Because a large percentage of the current harvest is from fish 14-15 inches, protection of fish at these sizes would be beneficial to the spawning stock biomass. Although reductions resulting from a maximum size limit are not included in this supplement, this issue could be further explored in an amendment.

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Area closures

Area closures would involve closing portions of the inshore or ocean water to protect southern flounder during a particular life stage. Upper portions of the Neuse, Pamlico and Pungo Rivers were closed to shrimp trawling beginning in 2006 to minimize juvenile southern flounder bycatch. Southern flounder use a wide variety of inshore habitats and selecting a specific habitat that will protect large numbers of fish may be difficult due to the mobility of fish. During the fall migration, southern flounder rapidly pass through various estuarine areas, concentrating at inlets on their way to the ocean. Inlet corridors are already closed to large mesh gill nets in Pamlico Sound from Sept. 1 through Dec. 15 to minimize sea turtle interactions; however, closing areas will likely result in fishermen targeting flounder just outside the closed area and possibly recouping most of the harvest. Additionally, exact migratory corridors are not known and would require extensive research to determine. This issue could be further explored in an amendment.

Management Measures Analyzed As Options For Requested Reductions

The reductions in catch provided below are based on an average of 2011-2014 data. These years were chosen because the most recent major regulation change for southern flounder occurred early in 2011. In February 2011, the minimum size limit was increased to 15 inches for the recreational fishery. There have been various regulation changes to the commercial gill net fishery (gear modifications, area exemptions, area closures, etc.) since 2011; however, many of these measures began in 2010 as part of the sea turtle lawsuit settlement agreement. Some of these measures were adopted for southern flounder management in Amendment 1 to the Southern Flounder FMP in February 2013. It is important to note, harvest data from 2014 is still preliminary and is likely to change. Recreational gig harvest and discard estimates were not yet available for 2014. Commercial gill net discard estimates were also not available for 2014 to include in the reduction calculations.

The reductions presented are estimates that assume consistent fishery catch, southern flounder length distributions and year class strength. If any of these assumptions are incorrect, it can affect the accuracy of estimated reductions. Catch reductions were calculated using estimates of dead discards that are only available for commercial gill nets and recreational hook and line and gig fisheries. Due to assumptions made in calculating hook and line discards and lack of estimates for other important fisheries (commercial pound nets and gigs), confidence in estimated harvest reductions was higher than catch reductions. Importantly, due to the uncertainty about estimates of dead discards, it will be difficult to determine if estimated catch reductions are actually achieved; however, accurate catch reduction estimates would provide the best indication of the benefits of management measures for the stock. Regardless of the approach taken for estimating reductions - catch or harvest - the impact of discards should be considered when evaluating any new management measure. Although the discussion focuses on catch reductions as requested by the MFC, harvest reductions were also calculated for each option (see Appendix 2). In previous documents developed by the NCDMF for southern flounder fishery management, reductions from new measures were based on harvest rather than catch (although discards were included in stock assessments).

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The first step in estimating reductions was to calculate the number of fish harvested by recreational and commercial fisheries. Harvest is defined as the number of fish kept. All reductions were calculated in numbers of fish rather than weight because the request was for reductions in catch (including discards). The NCDMF collects data on discards for some fisheries (commercial gill net, recreational hook and line and gig fisheries), but only in numbers of fish rather than weight. The NCTTP commercial fishery inshore flounder harvest data in weight was converted to numbers of fish using data collected by NCDMF fish house sampling programs by market grade, gear, month and year (Table 3). Available fish house sampling data for 2014 was used but a small percentage of the data were not yet complete at the time of this report. Recreational harvest is reported in numbers of fish by MRIP and the NCDMF mail-based survey of gigging. Recreational data included inshore and ocean areas.

To calculate catch reductions, discards were also estimated. For the purposes of this supplement, catch was defined as the number of southern flounder that die as a result of being captured including those kept, discarded dead and those released alive that later die due to injuries sustained by capture (post-release discard mortality). Recreational releases of flounder were rarely recorded by MRIP beyond the genus (*Paralichthys*) level. Releases were not observed by interviewers and most recreational fishermen are not able to report flounder to the species level. In other words, recreational releases of flounder in MRIP are only recorded as “flounder” and do not differentiate between summer flounder, southern flounder or Gulf flounder. To estimate the number of southern flounder released, the proportion of southern flounder estimated by MRIP as harvested (relative to other *Paralichthys* species) was applied to the number of reported released flounder (*Paralichthys*) from the same Wave (1-6), Mode (type of fishing) and Area (inshore vs. ocean). This method relies on an important assumption that the flounder discard species ratio is the same as the harvest species ratio. The NCDMF mail-based survey was used to estimate the number of southern flounder discarded by the recreational gig fishery. Estimates of discards were also calculated for the estuarine commercial gill net fishery based on NCDMF observer data. For the remaining commercial gears it was assumed that no dead discards occurred during 2011-2014 because sufficient data were not available to estimate discards. Based on studies of post-release discard mortality, seasonal mortality rates were applied to available estimates of discards by gear to estimate numbers of discard mortalities (i.e., dead discards). Detailed methods used to calculate reductions for each option discussed in this supplement are available in Appendix 3. All reductions presented in the Discussion were from the total sector (commercial or recreational) catch or total fishery (commercial and recreational) catch. To show the impacts to each gear, reductions from gear totals were also calculated and are available in Appendix 4.

Table 3. Numbers of southern flounder by gear and sector used for calculating reductions based on 2011-2014* average. ND = no data available

Estimate Type	Commercial					Recreational			All
	Gill net	Pound net	Gig	Other	Total	Hook & line	Gig	Total	Total
Harvest	466,646	306,565	71,753	10,249	855,212	129,536	50,903	180,439	1,035,651
Dead Discards	11,339	ND	ND	ND	11,339	80,954	2,758	83,713	95,051
Catch	477,984	306,565	71,753	10,249	866,551	210,490	53,661	264,152	1,130,703

*2014 data are preliminary, 2014 commercial discard and all recreational gig data were not available

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Option 1: Implement a season closure

A season closure is used to restrict harvest during certain times of the year, reduce annual landings and discards, and increase spawning stock biomass. The 2005 Southern Flounder FMP implemented a month-long season closure in December for the commercial fishery (NCDMF 2005). The recreational fishery is currently open year round. The effect of additional season closures on catch was examined in half-month intervals starting Aug. 1. This date was chosen to encompass the range (25% to 60%) of reductions requested by the MFC. The current commercial inshore flounder season is Jan. 1 – Nov. 30 and the recreational season is open all year.

Tagging and maturity data indicate southern flounder remain in estuarine waters until they mature, beginning their spawning migration to ocean waters in fall months. As a result, any split season closure to the fishery (closing and then reopening before the end of the year) will be unlikely to realize the estimated reduction. This is because southern flounder could be caught once the fishery is reopened and before they emigrate from estuaries. Due to this potential for recoupment of harvest, the season closures presented here are cumulative starting at the end of the season (without a split season option). Since the temporal distribution of harvest for the commercial and recreational fisheries are different, achieving the same reduction for each sector would require closures of different length by sector.

There are multiple potential advantages and disadvantages to season closures. A season closure for southern flounder in the fall will allow for more escapement (number of mature individuals leaving estuaries to spawn) assuming harvest does not increase dramatically prior to the closure. The longer the season closure, the less likely the fishery could recoup landings by increasing harvest prior to the closure. If harvest is allowed for any gear that typically harvests southern flounder during the closure period, there is a high likelihood for recoupment of some or all harvest. If harvest is closed, but any commercial or recreational gear that regularly catches flounder is allowed to continue fishing during the closure period there will be discards, thus diminishing the estimated catch reduction. For these reasons, the best chance to achieve the estimated reductions is to remove all gears regularly catching flounder from the water and prohibit the sale of flounder caught in inshore waters during a closed. Nevertheless, in some cases, stopping all fishing by gears that catch flounder will not be reasonable or practical and this must be considered when implementing a season closure. While most gears that harvest flounder also target other species, some gears such as hook and line and small mesh gill net fisheries that harvest flounder often do not target flounder. If the closure occurs at the end of the season, fish are more likely to be larger and mature and the ratio of immature fish in the annual harvest may well increase; however, if catch is reduced by an end of the season closure this would increase escapement and the spawning stock biomass. Not all southern flounder protected from harvest or discard by a closed season will mature and spawn each year. Many may remain in the estuaries through the following year, thus making them vulnerable to fishing pressure in the subsequent fishing season. An assumption in calculating reductions due to a closed season is harvest during open months will not differ from the 2011-2014 average harvest during those same months. It should be noted, however, that landings for both sectors have been quite variable from year to year and should not be expected to match the 2011-2014 average in future years. Additionally, effort and catch may increase prior to a closure, resulting in a lower reduction than estimated.

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Reductions for the commercial fishery

The timing and magnitude of peak southern flounder landings are different for the gill net, pound net and gig fisheries, so a season closure will impact each gear differently. In closure periods beginning prior to Sept. 1, gill nets contributed the largest reduction from the overall fishery but pound nets contributed the largest reduction with closure periods starting Sept. 1 (Table 4, Figure 6). This is due to concentration of pound net harvest in September-November. To achieve an estimated 25% catch reduction for the commercial fishery, a season closure will need to start in late-October. A closure beginning in late-September will be needed to achieve an estimated 60% reduction in the commercial fishery. An end of season closure will impact the pound net fishery most among commercial gears; a closure Oct. 1 – Nov. 30 will reduce the pound net catch by an estimated 81% (see Appendix Table A4.1 and Figure A4.1). In comparison, this closure would reduce the gig and gill net catch by approximately 18% and 37%, respectively.

Season closures will have different impacts geographically for the commercial fishery. Harvest peaks in areas at different times due to variation in gear used and southern flounder availability. Late in the year, the harvest tends to concentrate on the eastern side of estuaries as flounder migrate toward ocean inlets. A late-season closure may shift gill net and gig effort to areas that produce higher numbers of southern flounder earlier in the season (e.g., western sides of estuaries), thus recouping some harvest. Pound nets are stationary gear and could not easily be moved from eastern sides of estuaries to recoup landings, so this fishery would likely be greatly impacted by a late-season closure.

It was assumed that commercial harvest of flounder would cease during a season closure, which would be expected to decrease fishery harvest in the short-term. It is possible that effort will increase prior to the closure, especially in the gill net and gig fisheries, resulting in recoupment of some harvest expected to be lost due to the closure. This shift in peak effort may be mitigated by seasonal gill net closures due to protected species interactions or availability of fish but these impacts are difficult to predict. Migration of flounder during the fall months produces the highest catches of the year for the gill net and pound net fisheries. As these gears are the primary methods of harvesting flounder, a closure of fall months would be likely to produce reductions that could not be recouped by shifting effort earlier in the season. Other commercial gears that catch flounder include gigs, small mesh gill nets, crab trawls, shrimp trawls and crab pots. If any gear that catches flounder is allowed to operate during a closed season, the estimated reduction will be diminished due to any dead southern flounder discards produced (and any harvest that is allowed). Additionally, shifting harvest earlier in the season will likely increase the proportion of smaller fish in the harvest.

The only available discard or discard mortality estimates for commercial gear used for harvesting southern flounder was for estuarine gill nets. With no estimates of dead discards for the remaining commercial gears, the total average commercial catch used in this supplement is likely lower than the actual catch for 2011-2014. This likely makes the calculated catch reduction somewhat higher than it would be if discards were known for all gears. It was assumed there would be no discard mortality during a closed season; however, this assumption would be incorrect if any gear that catches flounder is left in the water. Because there were no estimates of discards available for most commercial gears and gill net discards represent a small component

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of the commercial catch, the estimated commercial catch and harvest reductions due to a season closure are very similar.

Table 4. Commercial catch reductions (percent) from the total commercial catch for season closures based on a 2011-2014* average. Bolded rows include a reduction within the requested range for the total commercial fishery. See harvest reductions in Table A2.1.

Closure	Gill net	Pound net	Gig	Other gears	Total
Nov 16-Dec 31	1	3	<1	<1	5
Nov 1-Dec 31	5	10	1	<1	16
Oct 16-Dec 31	12	20	1	<1	33
Oct 1-Dec 31	20	29	2	<1	50
Sept 16-Dec 31	30	35	2	<1	67
Sept 1-Dec 31	34	35	3	<1	72
Aug 16-Dec 31	38	35	3	1	77
Aug 1-Dec 31	41	35	4	1	81
Jan 1-Dec 31	55	35	8	1	100

*2014 data are preliminary, 2014 discard estimates were not available

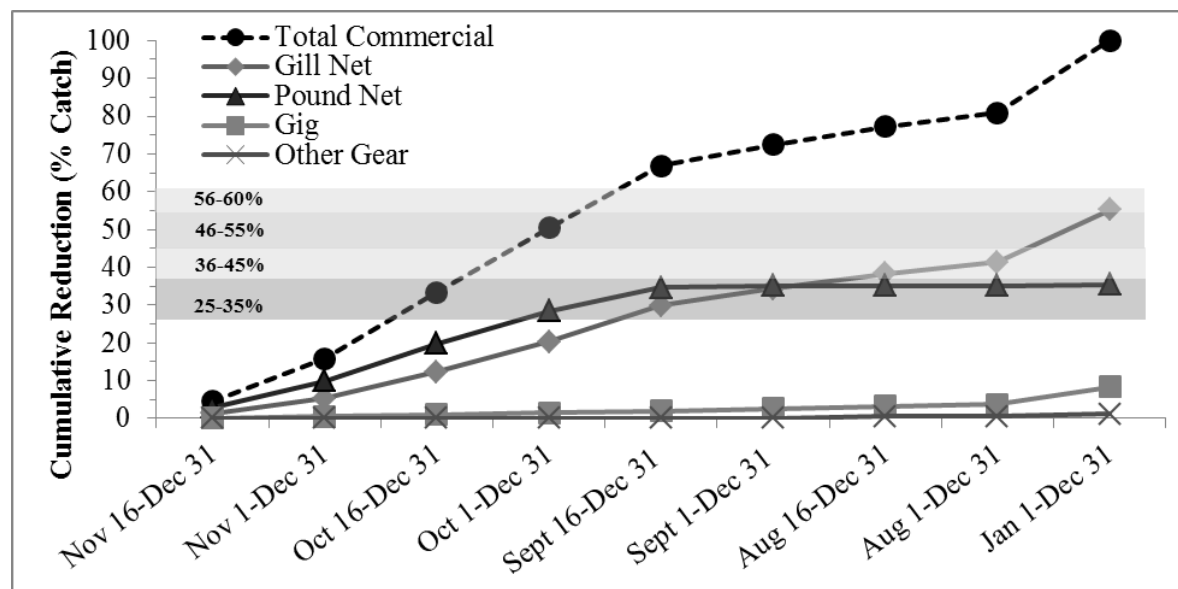


Figure 6. Commercial catch reductions (percent) from the total commercial catch for season closures based on a 2011-2014 average.

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Reductions for the recreational fishery

For closures starting prior to Oct. 1, hook and line contributed more than gigs to reductions from the total recreational fishery (Table 5, Figure 7). This is due to the greater harvest and discards for hook and line for most of the year; however, in fall the gig harvest is greater than hook and line, thus more of the total recreational fishery reduction comes from gigs after Oct. 1. A closure beginning Aug. 16 was estimated to be needed for the recreational fishery to meet the minimum reduction requested by the MFC. Estimates indicate a complete shutdown of the recreational flounder fishery would be required to achieve the maximum catch reduction in the range requested by the MFC. Catch reductions were considerably lower than harvest reductions for this option due to the expected increase in dead discards (see Appendix 2 for harvest reductions).

Catch reductions from season closures were greater for the recreational gig fishery than for the hook and line fishery. A complete year closure would only result in an estimated 55% catch reduction for hook and line gear, whereas this would result in a 100% reduction for gig catch (see Appendix Table A4.2 and Figure A4.2). This is based on the assumption that hook and line gear would continue to be used during a season closure and gigs would not be used. While hook and line gear is used to target many different species other than flounder, gigs are primarily used for flounder. Because flounder are often caught when targeting other species with hook and line, and additional flounder may be available in the system if other gears are closed, it was assumed that southern flounder harvested on average in 2011-2014 would be caught and released during a closed season. Therefore, seasonal discard mortality rates were applied to average hook and line harvest plus discards from 2011-2014 for each closed period to estimate expected dead discards. Although this is likely an overestimate of the number of dead discards from hook and line gear that would occur during a season closure, this method was determined to provide the best estimate with available data. In the recreational gig fishery, all discards were assumed to be dead due to injuries sustained by this gear. If this assumption is incorrect, the estimated reduction will change only slightly since gig discards are a small component of the recreational catch.

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Table 5. Recreational catch reductions (percent) from the total recreational catch for season closures based on a 2011-2014* average. Bolded rows include a reduction within the requested range for the total recreational fishery. See harvest reductions in Table A2.2.

Closure	Hook & Line	Gig	Total
Dec 16 - Dec 31	<1	1	1
Dec 1 - Dec 31	<1	2	2
Nov 16 - Dec 31	<1	3	3
Nov 1 - Dec 31	2	4	5
Oct 16 - Dec 31	4	5	9
Oct 1 - Dec 31	6	6	13
Sep 16 - Dec 31	11	8	18
Sep 1 - Dec 31	14	9	23
Aug 16 - Dec 31	22	11	33
Aug 1 - Dec 31	26	12	38
Jan 1 - Dec 31	44	20	64

*2014 data are preliminary, 2014 gig harvest and discard data were not available

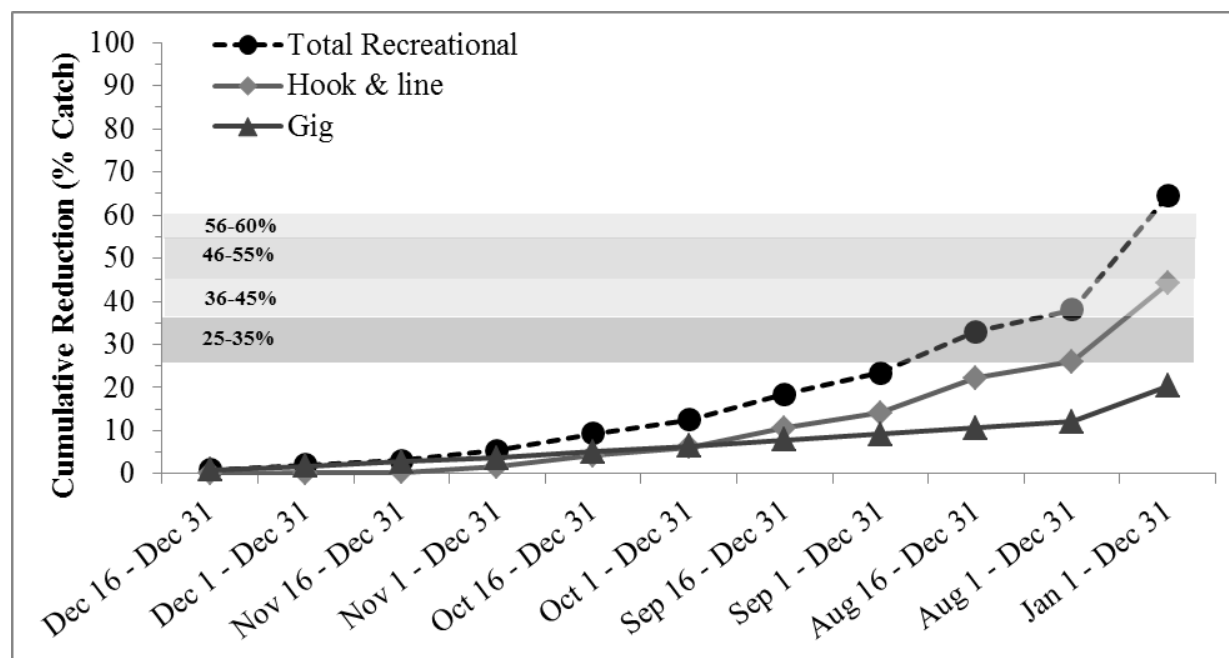


Figure 7. Recreational catch reductions (percent) from the total recreational catch for season closures based on a 2011-2014 average.

Reductions for the combined fishery

Reductions from various season closures were also explored for the combined fishery (commercial and recreational). The total catch in numbers of fish was calculated and all

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reductions were relative to these totals. To reach the lower end of the catch reduction range requested for this supplement a season closure would need to begin Oct. 16 (28%; Table 6, Figure 8). The closure would need to start Sept. 1 for a catch reduction that reached 60%. Because the peak harvest occurs at different times for the commercial and recreational fisheries, different closure periods were examined for the two sectors. For example, a reduction at the lower end of the requested range could be achieved by an Oct. 16-Dec. 31 commercial closure and a Nov. 16-Dec. 31 recreational closure (26%; Table 7). A similar reduction could be achieved by a commercial closure from Nov. 1-Dec. 31 and a complete recreational season closure (24%; Table 7). This analysis demonstrates closures for the recreational fishery must be much longer than for the commercial fishery to achieve an equal reduction for each sector. The reason is recreational harvest peaks much earlier in the year than the commercial harvest. Catch reductions were considerably lower than harvest reductions for this option due to the expected increase in dead discards (see Appendix 2 for harvest reductions).

Table 6. Catch reductions (percent) from the combined fishery catch for season closures based on a 2011-2014* average. Bolded rows include a reduction within the requested range for the combined fishery total. See harvest reductions in Table A2.3.

Closure	Commercial					Recreational			All
	Gill net	Pound net	Gig	Other	Total	Hook & line	Gig	Total	Total
Nov 16-Dec 31	1	2	< 1	< 1	3	< 1	1	1	4
Nov 1-Dec 31	4	8	< 1	< 1	12	< 1	1	1	13
Oct 16-Dec 31	9	15	1	< 1	26	1	1	2	28
Oct 1-Dec 31	16	22	1	< 1	39	2	2	3	42
Sept 16-Dec 31	23	27	1	< 1	51	2	2	4	55
Sept 1-Dec 31	26	27	2	< 1	55	2	2	4	60
Aug 16-Dec 31	29	27	2	< 1	59	3	2	5	64
Aug 1-Dec 31	32	27	3	< 1	62	3	3	6	68
Jan 1-Dec 31	42	27	6	1	77	7	5	12	89

*2014 data are preliminary, 2014 commercial gill net discard estimates were not available, 2014 recreational gig data were not available

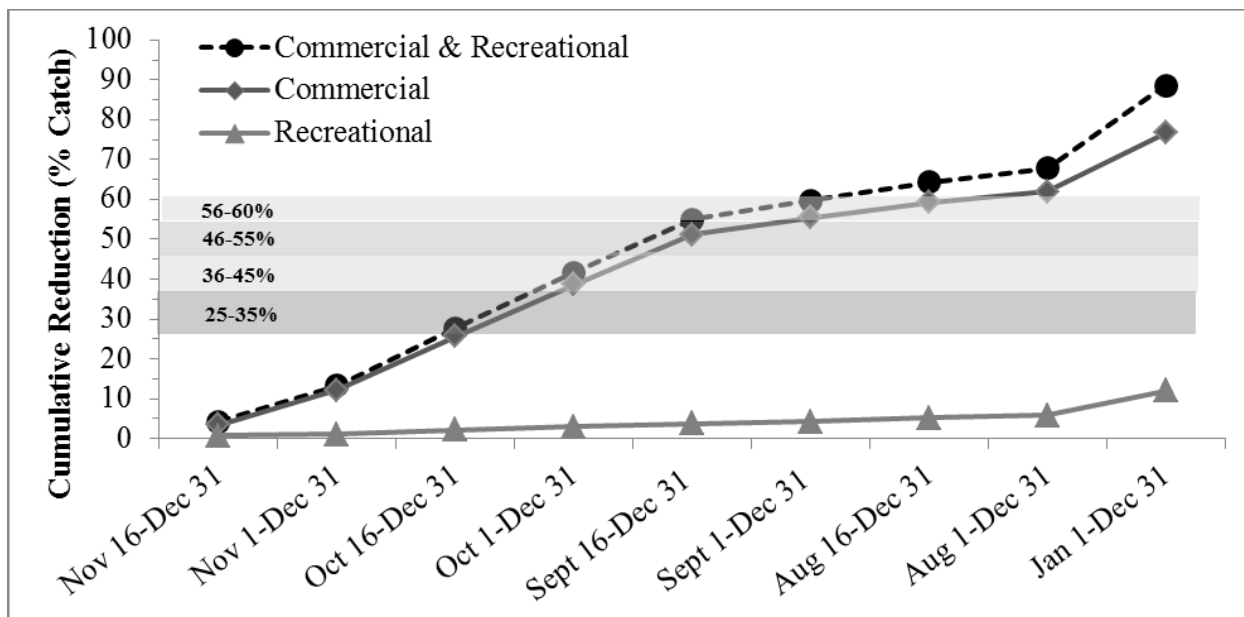


Figure 8. Catch reductions (percent) from the combined fishery catch for season closures based on a 2011-2014 average.

Table 7. Catch reductions (percent) from combined fishery catch for season closures by sector based on 2011-2014* average. Closures start on the dates shown and end on Dec 31. Bolded reductions were within the requested range. See harvest reductions in Table A2.4

Commercial closure	Recreational closure								
	1-Jan	1-Aug	16-Aug	1-Sep	16-Sep	1-Oct	16-Oct	1-Nov	16-Nov
1-Jan	89	82	82	81	80	80	79	78	77
1-Aug	74	68	67	66	66	65	64	63	63
16-Aug	71	65	64	63	63	62	61	60	60
1-Sep	67	61	61	60	59	59	58	57	56
16-Sep	63	57	56	55	55	54	53	52	52
1-Oct	51	45	44	43	42	42	41	40	39
16-Oct	38	31	31	30	29	29	28	27	26
1-Nov	24	18	17	16	16	15	14	13	13
16-Nov	15	9	9	8	7	6	6	5	4

*2014 data are preliminary, 2014 commercial gill net discard estimates were not available, 2014 recreational gig data were not available

Option 2: Minimum size limit increase

Increasing the minimum size limit is a management measure used to help end overfishing, rebuild the spawning stock, and allow a greater portion of fish an opportunity to spawn before they can be harvested. Based on southern flounder maturity at size derived from Midway and

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Scharf (2012), the size at 50% maturity (L50) is approximately 15.75 inches (Table 8). Reductions are presented for increasing the minimum commercial minimum size limit to 15 inches or 16 inches for both sectors. While increasing the minimum size limit above 16 inches is possible, this was not examined in the supplement due to the expected level of discards.

Minimum size limit increases can be effective at reducing harvest as long as compliance with the regulations is consistent. The reductions associated with a minimum size limit increase assume the proportion of undersized fish in the harvest remains similar to the current proportion. Data from before and after the commercial minimum size limit change in 2005 indicate that the percentage of undersized fish in the harvest remained relatively similar and without trend (Table 9). Although there is a slight increasing trend in the percentage of undersized southern flounder in the recreational harvest since the minimum size limit change in 2011 (Table 10), more years of complete data are needed to fully assess this potential trend.

Increasing the minimum size limit may have the effect of increasing the total harvest of fish above the new minimum size limit. Due to the relatively greater fecundity (the number of eggs released by a female) of larger individuals, increased harvest of larger individuals would not be beneficial for spawning stock biomass; however, it is not clear that harvest of larger individuals would increase. If a larger minimum gill net mesh size was implemented it is possible that harvest of larger individuals would increase for that gear since larger mesh sizes tends to catch larger fish; however, some gill net fishermen already use nets with mesh size above the current minimum. More importantly, harvest of larger southern flounder by other commercial and recreational gears would likely not increase since they already target all size classes. Although it is possible the distribution of harvest of larger individuals may change among gears, the total harvest of these fish may not change substantially as a result of a minimum size limit increase; however, if the spawning stock biomass increases, there may well be increased catches of large fish in the future.

There are multiple potential advantages and disadvantages to raising the minimum size limit. This would potentially allow a larger number of fish the opportunity to leave estuaries to spawn prior to being harvested, thus increasing the size of the spawning stock. Increasing the minimum size limit would also be consistent with NCDMF strategies for setting minimum size limits for other managed species, based on maturity information. However, not all discarded undersized southern flounder will survive to spawn; some will die after release. Some will survive release but will subsequently grow to legal size and be harvested at a later date within the year, thus decreasing the impact of the minimum size limit change on fishery harvest. Some fish that survive after being discarded may not mature until the next year, remaining in estuaries where they could be caught by the fishery the following season. Although this would not decrease the reduction in catch for the first year, it could make estimated reductions less likely to be achieved in the following year and decrease the benefit to spawning stock biomass in subsequent years. In the short term, a minimum size limit increase would diminish the pool of fish available for harvest, which in turn would produce a decrease in overall catch and harvest. However, increasing the minimum size limit would allow harvest to continue throughout the currently open season. The relative percentage reduction to the fishery will be greatest in the first half of the year because growth of southern flounder is rapid during the summer and more fish will be legal size by the fall compared to the spring.

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Table 8. Percent of females mature by length based on 2014 southern flounder stock assessment.

Total length (inches)	% Mature
10	1
11	1
12	3
13	8
14	17
14.5	24
15	34
15.5	45
15.75	50
16	55
17	76
18	89
19	95
20	98
21	99
22	100

Table 9. Annual percentage of undersized southern flounder in annual commercial harvest.

Year	Size limit	% undersized
2003	13"	3
2004	13"	4
2005	14"*	9
2006	14"	6
2007	14"	7
2008	14"	7
2009	14"	7
2010	14"	6
2011	14"	3
2012	14"	8
2013	14"	6
2014	14"	4

* implemented April 2005

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Table 10. Annual percentage of undersized southern flounder in annual recreational harvest.

Year	Size limit	% undersized
2009	14"/15"*	2
2010	14"/15"*	3
2011	15"	4
2012	15"	6
2013	15"	9

* 14" size limit in western portions of Albemarle and Pamlico sounds and its tributaries, and ocean and estuarine waters south of Brown's Inlet to the SC border; 15" size limit north of Brown's Inlet in eastern estuarine and ocean waters

Reductions for the commercial fishery

The impact to each gear due to a minimum size limit change was variable. Gill nets contributed the most to the overall commercial fishery reduction (Table 11). The reason is gill nets caught the most southern flounder and a relatively high proportion of 14- and 15-inch fish. An increase in the minimum size limit to 15 inches was estimated to reduce the total commercial catch by 18%. Increasing the minimum size limit to 16 inches would reduce commercial catch by an estimated 32%, which would achieve the minimum catch reduction requested by the MFC. While the 'other gear' category had the greatest reduction by gear (see Appendix Table A4.3), the reduction from this category contributed very little to the overall commercial fishery reduction due to the small amount of harvest (Table 11). The second highest reduction by gear was for gill nets.

Catch reductions were calculated for the commercial fishery based on increasing the minimum size limit to 15 inches and 16 inches from the current 14-inch limit. Catch reductions do not include further reductions that would be expected from an increase in gill net and pound net escape panel mesh sizes. Catch reductions were considerably lower than harvest reductions for this option due to the expected increase in dead discards (see Appendix 2 for harvest reductions). An increase in gill net and pound net escape panel mesh sizes would likely result in larger catch reductions than those shown below due to the expected smaller number of dead discards.

Estimates of discard percentages at 14-, 15- and 16-inch minimum size limits using gill net stretched mesh sizes of 5.5 (the current minimum for large mesh nets), 5.75, 6.0 and 6.5 inches from the NCDMF observer program are provided (Table 12). Mesh sizes above 6.5 inches were seldom observed and would not be considered viable options because they are not allowed in accordance with the division's Federal Sea Turtle Incidental Take Permit (ITP). Analysis of NCDMF observer data indicates that increasing mesh size reduces the number of undersized fish retained in gill nets. The majority of the observations occurred in Pamlico Sound, which is an important area for the fishery, but the majority of large mesh gill net landings of flounder are typically from the ASMA. It is important to consider the ASMA typically has a higher proportion of smaller southern flounder in catches, and thus would be expected to produce more discards, than Pamlico Sound. A study by Kimel et al (2008) had similar results to NCDMF observer data regarding percentages of discards at different mesh sizes and minimum size limits. Due to the geographic and temporal range of data, and measurements of all sizes of flounder

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caught, NCDMF observer data were determined to be the most appropriate for characterizing the percentage of discards at various mesh sizes. Nevertheless, this approach and results have not been through the typical NCDMF review process and further analysis may yield different results.

Estimates of discard percentages at 14-, 15- and 16-inch minimum size limits using pound net escapement (escape) panel stretched mesh sizes of 5.5 (the current minimum size), 5.75 and 6.0 inches from NCDMF studies are provided (Table 13). Analysis of data from NCDMF studies testing pound net escape panels in Albemarle Sound, Pamlico Sound and Back Sound indicates increasing escape panel mesh size reduces the number of undersized fish retained in pound nets (Brown 2014, unpublished NCDMF data). NCDMF studies did not test escape panels with mesh sizes above six inches, but it is assumed that larger mesh sizes would further reduce discards. However, it should be noted that the MFC rule defining pound net sets indicates that six inches is the maximum mesh size for escape panels that the NCDMF Director can require (15A NCAC 03J .0501 (e)(1)). Most of the samples from NCDMF studies came from Albemarle Sound and Back Sound. Although these areas are important areas of pound net harvest, the majority of pound net landings typically come from Pamlico Sound. The dataset used for this analysis may be the best available; however, due to time constraints this approach and results may require additional review and further analysis may yield different results.

Reductions presented here were based on catch for the whole year. If the minimum size limit increase was implemented late in the year, reductions would likely be smaller than those presented here during the first year of the change. However, because southern flounder grow quickly throughout the year, estimating commercial fishery reductions based on data from fall months may be more accurate. Reductions based on annual data will most likely be overestimates due to the likelihood of discards in the first half of the year growing into the legal limit and being caught by the end of the year.

Dead discards were estimated for each commercial gear for calculating catch reductions. Because there were no available discard mortality estimates for commercial gears aside from gill nets, the seasonal gill net post-release discard rates were also applied to the expected discards for all commercial gears resulting from raising the minimum size limit. There is no reason to expect this rate to be the same for all commercial gears, but this method was used to account for discard mortality in a consistent manner using the only available data. If the applied post-release discard rate is lower or higher than the true rate for any of the gears, the estimated catch reductions will be correspondingly higher or lower than reality.

Some positive and negative impacts due to increasing the minimum size limit are specific to the commercial fishery. Most commercial gears will have increased discards without gear modifications to allow southern flounder to avoid being caught. The expected increase in discards from the commercial fishery could be mitigated by modifying gear to allow fewer sublegal fish to be caught. The 2005 Southern Flounder FMP implemented a minimum large mesh gill net size of 5.5 inches stretched mesh and required escape panels of 5.5 inches stretched mesh in flounder pound nets coast wide in conjunction with the minimum size limit increase (NCDMF 2005). NCDMF data indicate increasing the mesh size for these gears will decrease the percentage of flounder caught at 14 and 15 inches. Although some fishermen already use mesh sizes greater than the minimum, many do not and would need to order new nets and/or panels. An increase in the minimum size limit would impact some fishing areas more than others due to southern flounder life history patterns and habitat use. NCDMF gill net observer

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data indicate the Albemarle Sound Management Area (ASMA) could be most impacted by the minimum size limit increase, followed by Core/Back sounds (Table 14). Because the discard post-release mortality rate for gill nets is much higher in summer compared to other months, a closure of especially the large gill net fishery during summer months would greatly reduce discard mortality.

Table 11. Catch reductions (percent) from total commercial catch for minimum size limit increases based on 2011-2014* commercial catch average. Bolded row includes a reduction within the requested range for the total commercial fishery. See harvest reductions in Table A2.5.

Size limit	Gill net	Pound net	Gig	Other	Total
15 inch	11	6	1	0	18
16 inch	18	12	2	0	32

*2014 data are preliminary

Table 12. Percent of flounder below potential minimum size limits by gill net mesh size in 2004-2006, 2008, and 2012-2013* from NCDMF observer program.

Criteria	Stretched mesh size (inches)				
	5.5	5.75	6	6.25	6.5
% below 14 inch	26	15	7	5	4
% below 15 inch	59	41	20	12	11
% below 16 inch	81	68	46	35	31
Total fish measured	26,245	13,967	31,751	3,293	3,175

*Years chosen due to statewide observer coverage

Table 13. Percent of flounder below potential minimum size limits by pound net escape panel mesh size from NCDMF studies in 1994, 1995, 1998 and 2011*.

Criteria	Stretched mesh size (inches)		
	5.5	5.75	6.0
% below 14 inch	39	15	5
% below 15 inch	55	30	25
% below 16 inch	75	53	56
Total fish measured	937	634	121

*Years of the NCDMF escape panel studies with consistent methodology

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Table 14. Percentage by length grouping of total southern flounder 14 inches and above in the commercial gill net fishery as measured in 2012-2013 by the NCDMF Observer Program.

Criteria (inches)	ASMA	Pamlico Sound	Pamlico Sound tributaries	Core/Back sounds	Southern areas	Total
14.0-14.9	41	23	35	39	30	31
14.0-15.9	74	53	60	65	60	61
Number 14.0+	5,935	10,975	1,413	2,643	2,693	23,724

Reductions for the recreational fishery

The current recreational minimum size limit is 15 inches, therefore only the reduction from a 16-inch minimum size limit was examined for the recreational fishery. The reduction at 16 inches was below the minimum range requested by the MFC (Table 15). Most of the estimated reduction from the total recreational fishery came from hook and line gear. Western counties had the greatest reduction for the hook and line fishery resulting from a 16-inch minimum size limit relative to northern and southern regions of the state (Figure 9). The NCDMF mail-based gig survey does not provide fish length data, but the MRIP collects length data for hook and line-harvested southern flounder. Lengths of fish harvested by gigs were assumed to be similar to those harvested by hook and line, but there are likely differences in length distributions between the gears that could impact the estimated reductions due to a minimum size limit increase. Catch reductions were considerably lower than harvest reductions for this option due to the expected increase in dead discards (see Appendix 2 for harvest reductions). It was assumed that all recreational harvest 15.0-15.9 inches from the 2011-2014 average would be caught and discarded with a minimum size limit increase to 16 inches. Unlike commercial gill nets and pound nets, hook and line gear cannot be modified to mitigate increases in discards that could result from increasing the minimum size limit. In contrast, recreational gigs operate by visually targeting flounder so it would be possible to avoid undersized flounder. The catch reductions presented here may be underestimates if gigs are able to avoid some undersized fish. Another likely outcome of increasing the minimum size limit is more discards of summer flounder and Gulf flounder, two species in the same genus as southern flounder. Summer flounder is more common north of Cape Hatteras, while Gulf flounder is mostly found in ocean waters south of Cape Hatteras. These species tend to be smaller than southern flounder in North Carolina so are more likely to be undersized. Although these flounder species are often caught in North Carolina, in recent years southern flounder has dominated the recreational flounder harvest. Catch reductions were considerably lower than harvest reductions for this option due to the expected increase in dead discards, but still did reach the MFC requested range (see Appendix 2 for harvest reductions).

Table 15. Catch reductions (percent) from total recreational catch with a 16-inch size limit based on 2011-2014* recreational catch average. See harvest reductions in Table A2.6.

Size Limit	Hook & Line	Gig	Total
16 inch	10	2	12

*2014 data are preliminary, 2014 gig data were not available

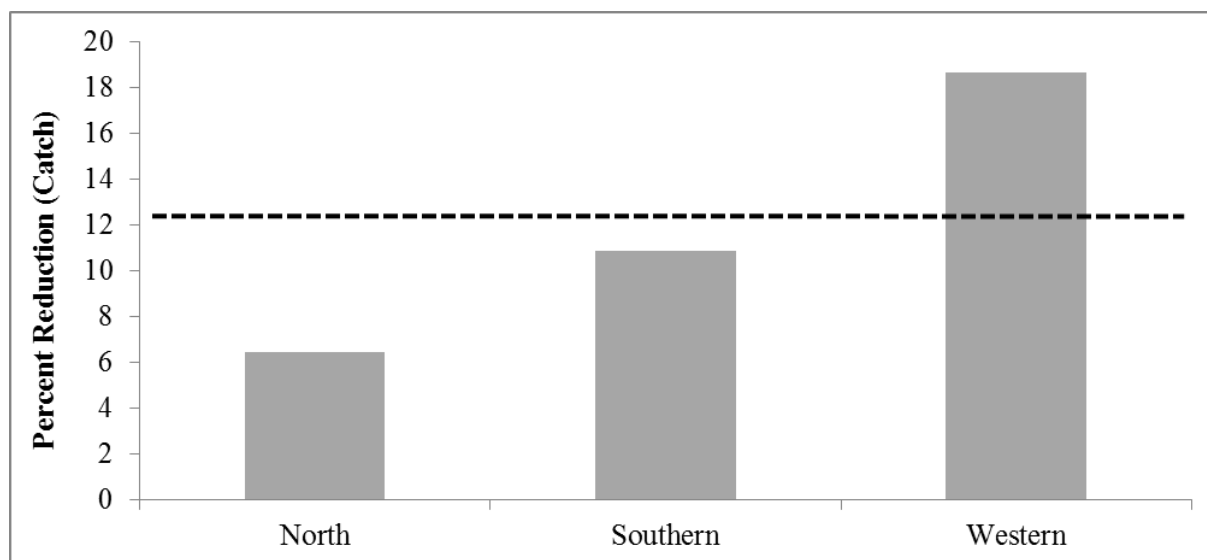


Figure 9. Reduction for recreational southern flounder hook and line fishery with 16-inch minimum size by region (North = Currituck-Carteret counties, Southern = Onslow-Brunswick counties, Western= counties on west side of Pamlico Sound). The dotted line is the mean reduction.

Reductions for the combined fishery

Reductions from a minimum size limit increase to 15 or 16 inches were also estimated for the combined fishery. The total catch in numbers of fish was calculated and all reductions were relative to this total. An increase to 15 inches (for the commercial fishery) would result in catch reductions below 25% (Table 16). Increasing the minimum size limit to 16 inches for both sectors resulted in a catch reduction above the minimum requested by the MFC (28%). Catch reductions do not include further reductions that would be expected from an increase in gill net and pound net escape panel mesh sizes. Catch reductions were considerably lower than harvest reductions for this option due to the expected increase in dead discards (see Appendix 2 for harvest reductions). An increase in gill net and pound net escape panel mesh sizes would likely result in larger catch reductions than those shown below due to the expected smaller number of dead discards.

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Table 16. Catch reductions (percent) from the combined fishery catch for minimum size limit increases based on 2011-2014* combined fishery average. Bolded row includes a reduction within the requested range for the combined fishery total. See harvest reductions in Table A2.7.

Size limit	Commercial					Recreational			All
	Gill net	Pound net	Gig	Other gears	Total	Hook & line	Gig	Total	Total
15 inch	9	4	1	< 1	14	0	0	0	14
16 inch	14	9	2	< 1	25	2	< 1	3	28

*2014 data are preliminary, 2014 commercial gill net discard estimates were not available, 2014 recreational gig data were not available

Option 3: Decrease the recreational bag limit

A creel or recreational bag limit for the recreational fishery is the number of fish allowed to be kept during a trip by an individual or boat. The 2005 Southern Flounder FMP implemented an eight-fish recreational bag limit for the recreational southern flounder fishery (NCDMF 2005). Supplement A to the Southern Flounder FMP decreased the recreational bag limit to six fish for the recreational flounder fishery in 2011. A similar management measure for the commercial fishery, trip limits, was not included as an option in this supplement because of drastic differences in trip level harvest by gear and month.

The reduction from decreasing to a one-fish recreational bag limit was estimated at less than 25% (Table 17, Figure 10). The hook and line fishery contributed the most to reductions from recreational bag limit decreases because of the greater harvest from this gear; however, reduction by gear was greater for the recreational gig fishery than for hook and line at any recreational bag limit because more flounder are caught on average per trip by gigging than by hook and line (see Appendix Table A4.5). Catch reductions were considerably lower than harvest reductions for this option due to the expected increase in dead discards (see Appendix 2 for harvest reductions).

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Table 17. Catch reductions (percent) from total recreational catch for recreational bag limit decreases based on 2011-2014* average. See harvest reductions in Table A2.8.

Bag Limit	Hook & Line	Gig	Total
1 fish	15	7	23
2 fish	6	3	10
3 fish	3	1	5
4 fish	1	1	3
5 fish	1	<1	2

*2014 data are preliminary, 2014 gig data were not available

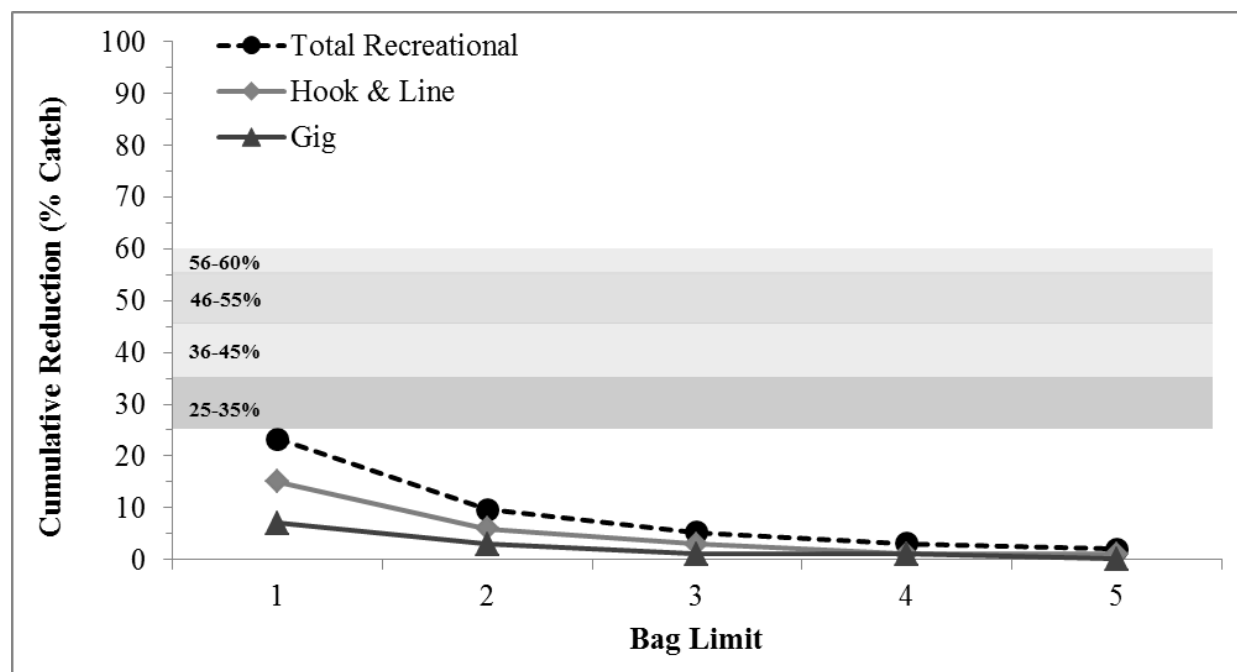


Figure 10. Catch reductions (percent) from recreational catch by gear for recreational bag limit decreases based on 2011-2014 average.

Option 4: Implement a season closure and increase the minimum size limit

Another option for reducing catch is to combine a season closure with a minimum size limit increase. This option has the potential to increase the benefits to the stock compared to implementing one type of measure alone. The reductions provided by an increase in the minimum size limit will allow the same reduction to be achieved, but with a shorter season closure than with a season closure alone. This would enable fishing to continue for more days. Increasing the minimum size limit would also reduce the likelihood of the fishery recouping landings by increasing effort prior to a season closure. A season closure will reduce the number of discards that might occur if the only management change was a minimum size limit increase. Both measures should increase escapement. A minimum size limit increase would increase escapement for fish below that limit, whereas a season closure at the end of the year would

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increase escapement for fish above and below the minimum size limit. Despite these benefits, all of the potential negative impacts discussed for season closures (Option 1) and increased minimum size limits (Option 2) will also need to be considered for this option. The impact of a combined approach on the percentage of immature fish in the harvest is unclear. A minimum size limit increase would reduce the percentage of immature fish in the harvest, while a season closure at the end of the year is likely to increase the percentage of immature fish in the harvest.

Reductions for the commercial fishery

If the minimum size limit was increased to 15 inches for the commercial fishery, a reduction above 25% was estimated to be achievable with a season closure two weeks shorter than with a season closure alone. A season closure would not be needed for a reduction above 25% with a 16-inch minimum size limit. Increasing the minimum size limit to 15 inches combined with a season closure starting Nov. 1 would result in an estimated reduction of 31% (Table 18, Figure 11). To achieve an estimated 60% catch reduction, a closure beginning Oct. 1 would be needed. Alternatively, a 16-inch minimum size limit and a closure starting Nov. 16 would result in an estimated 36% reduction. Starting the season closure Oct. 16 with a 16-inch minimum size limit resulted in an estimated 55% catch reduction. Catch reductions do not include further reductions that would be expected from an increase in gill net and pound net escape panel mesh sizes. Catch reductions were considerably lower than harvest reductions for this option due to the expected increase in dead discards (see Appendix 2 for harvest reductions). An increase in gill net and pound net escape panel mesh sizes would likely result in larger catch reductions than those shown below due to the expected smaller number of dead discards.

Table 18. Catch reductions (percent) from the total commercial catch for season closures and minimum size limit increases based on 2011-2014* commercial average. Bolded rows include a reduction within the requested range for the total commercial fishery. See harvest reductions in Table A2.9.

Closure	15 inch limit	16 inch limit
Nov 16-Dec 31	22	36
Nov 1-Dec 31	31	43
Oct 16-Dec 31	46	55
Oct 1-Dec 31	59	67
Sept 16-Dec 31	73	78
Sept 1-Dec 31	77	81
Aug 16-Dec 31	81	85
Aug 1-Dec 31	84	87
Jan 1 - Dec 31	100	100

*2014 data are preliminary, 2014 discard estimates were not available

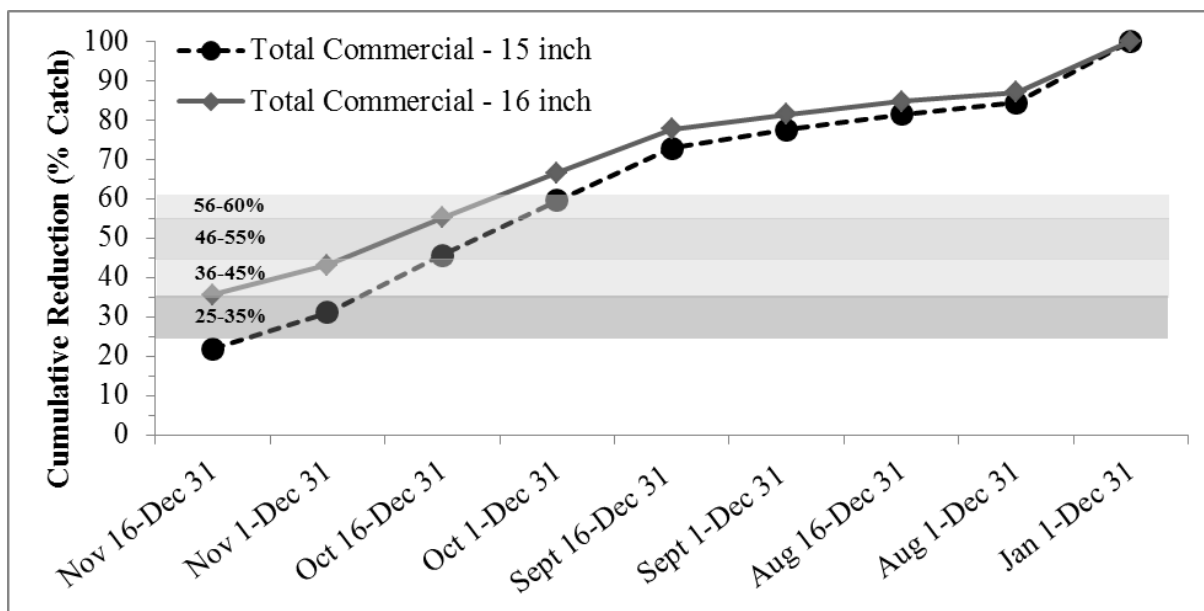


Figure 11. Commercial catch reductions (percent) from the total commercial fishery catch for season closures and minimum size limit increases based on 2011-2014 average.

Reductions for the recreational fishery

A season closure beginning Sept. 16 and a 16-inch minimum size limit resulted in an estimated catch reduction for the recreational fishery above the minimum requested by the MFC (28%; Table 19, Figure 12). Estimates indicated closing the entire season would be required to achieve a catch reduction above 60% for the recreational fishery. Combining a minimum size limit increase with a season closure achieved a reduction above 25% with a season closure one month less than with a season closure alone. Catch reductions were considerably lower than harvest reductions for this option due to the expected increase in dead discards (see Appendix 2 for harvest reductions).

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Table 19. Catch reductions (percent) from the total recreational catch for season closures and a 16-inch minimum size limit based on 2011-2014* recreational average. Bolded rows include a reduction within the requested range for the total recreational fishery. See harvest reductions in Table A2.10.

Closure	16 inch limit
Dec 16 - Dec 31	13
Dec 1 - Dec 31	14
Nov 16 - Dec 31	15
Nov 1 - Dec 31	17
Oct 16 - Dec 31	20
Oct 1 - Dec 31	23
Sep 16 - Dec 31	28
Sep 1 - Dec 31	32
Aug 16 - Dec 31	41
Aug 1 - Dec 31	45
Jan 1 - Dec 31	69

*2014 data are preliminary, 2014 gig data were not available

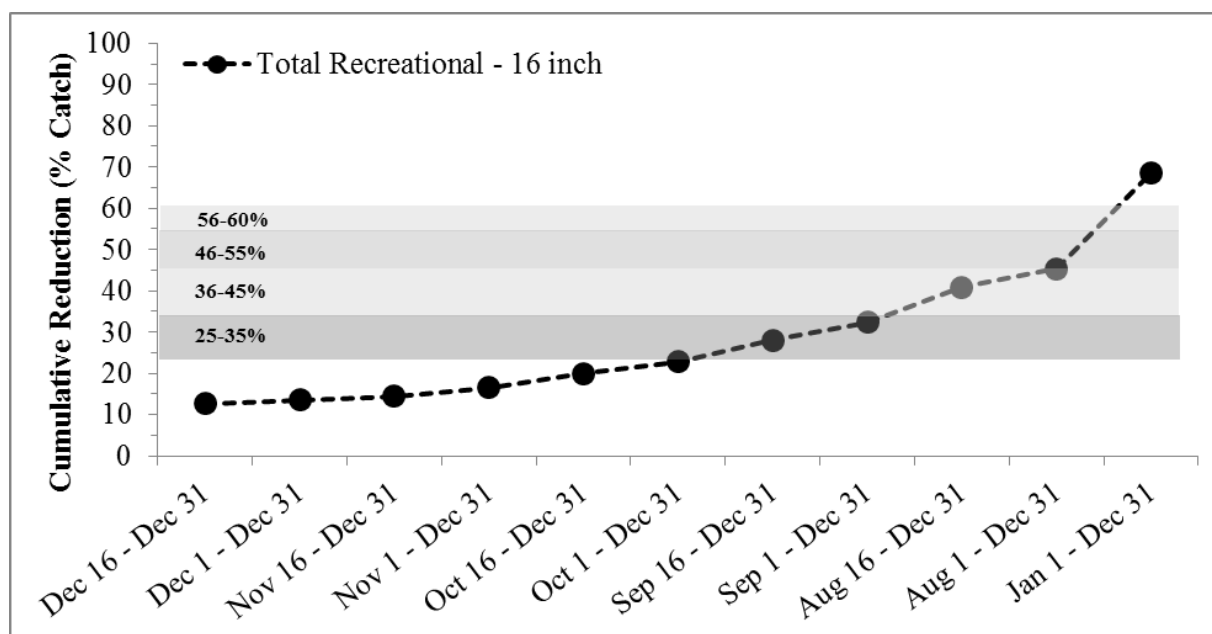


Figure 12. Catch reductions (percent) from the total recreational catch for season closures and a 16-inch minimum size limit based on 2011-2014 recreational average.

Reduction for the combined fishery

Reductions from a minimum size limit increase to 15 or 16 inches combined with season closures were also estimated for the combined southern flounder fishery. An increase to 15 inches (for the commercial fishery) combined with a closure Nov. 16 – Dec. 31 resulted in an estimated reduction of 18% (Tables 20, Figure 13). With a closure Nov. 1-Dec. 31 the estimated

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reduction increased to 25%. A closure period of Oct. 1-Dec. 31 combined with a 15-inch minimum size limit resulted in an estimated reduction of 50%. Increasing the minimum size limit to 16 inches combined with a closure Nov. 16-Dec. 31 resulted in an estimated reduction of 31%. An Oct. 1-Dec. 31 closure and a 16-inch minimum size limit resulted in an estimated 58% reduction. Catch reductions do not include further reductions that would be expected from an increase in gill net and pound net escape panel mesh sizes. Catch reductions were considerably lower than harvest reductions for this option due to the expected increase in dead discards (see Appendix 2 for harvest reductions). An increase in gill net and pound net escape panel mesh sizes would likely result in larger catch reductions than those shown below due to the expected smaller number of dead discards.

Table 20. Catch reductions (percent) from the combined fishery catch for season closures and size limit increases based on 2011-2014* combined fishery average. Bolded rows include a reduction within the requested range. See harvest reductions in Table A2.11.

Closure	15 inch limit	16 inch limit
Nov 16-Dec 31	18	31
Nov 1-Dec 31	25	37
Oct 16-Dec 31	38	48
Oct 1-Dec 31	50	58
Sept 16-Dec 31	61	67
Sept 1-Dec 31	65	71
Aug 16-Dec 31	69	74
Aug 1-Dec 31	72	77
Jan 1 - Dec 31	90	92

*2014 data are preliminary, 2014 commercial gill net discard estimates were not available,

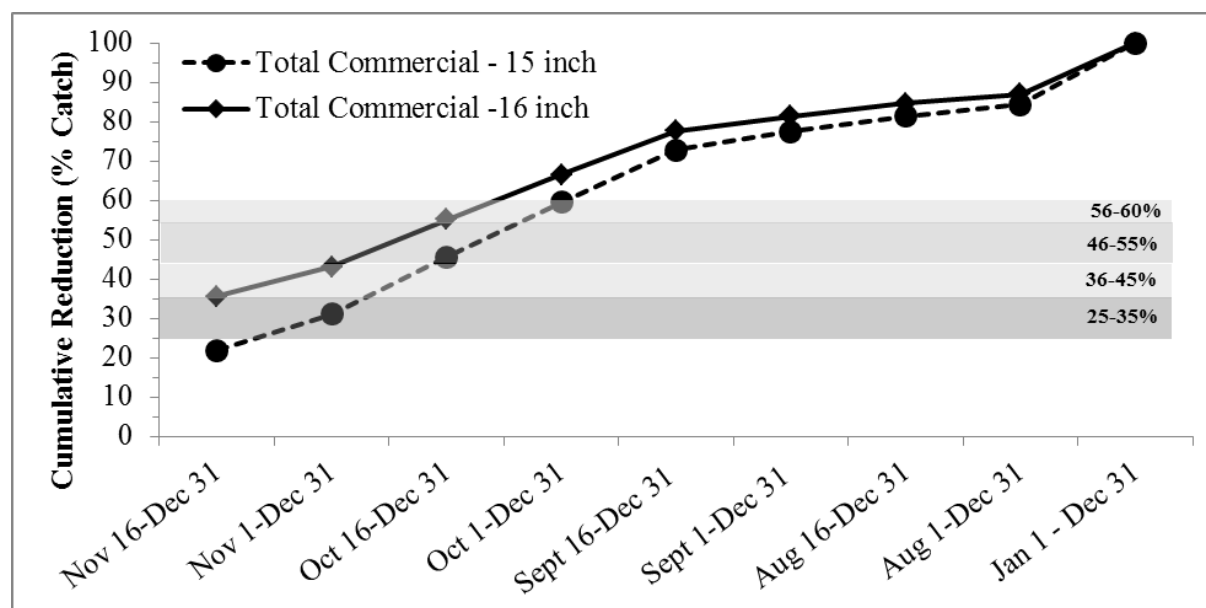


Figure 13. Catch reductions (percent) from the combined fishery catch for season closures and minimum size limit increases based on 2011-2014 combined fishery average.

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Option 5: Implement a season closure, increase the minimum size limit and decrease recreational bag limit

The final option included in this supplement for reducing catch is to combine a season closure, a minimum size limit increase and a recreational bag limit decrease. The recreational bag limit is a regulation for the recreational fishery only and therefore no additional commercial reduction is gained by adding this reduction. However, a decrease in the recreational bag limit does impact the total fishery reduction. This option includes all the advantages and disadvantages of implementing each management measure alone. A major advantage to combining measures in this way is to shorten the season closure but still maintain the requested fishery reduction. Also, reducing the recreational bag limit could make reductions more equitable between sectors for this option.

Recreational fishery reductions

Reductions within the target range (25-60%) can potentially be obtained through many potential combinations of minimum size limit, recreational bag limit, and season closures (Table 21). Although a reduction within the requested range is possible without reducing the recreational bag limit, this measure would reduce the needed season closure length at either the current minimum size limit or with a 16-inch minimum size limit. Reducing the recreational bag limit to one fish was estimated to reduce the fishery by less than 25% at the current minimum size limit unless a closure starting Nov. 16 is implemented (Table 21, Figure 14). With a two-fish recreational bag limit, the closure would need to start Sept. 16 to reach an estimated 25% reduction. With a minimum size limit of 16 inches it would be possible to reduce the recreational bag limit to one fish and avoid a season closure. A closure beginning Dec. 16, increasing the minimum size to 16 inches and reducing to a one-fish recreational bag limit resulted in an estimated reduction of 32%. A closure beginning Nov. 1, a minimum size limit increase to 16 inches and a recreational bag limit of two fish per angler would achieve an estimated reduction of 24%. Catch reductions were considerably lower than harvest reductions for this option due to the expected increase in dead discards (see Appendix 2 for harvest reductions).

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Table 21. Catch reductions (percent) from the total recreational catch for season closures, recreational bag limit decreases and a minimum size limit increase to 16 inches based on 2011-2014* recreational average. Bolded rows include a reduction within the requested range for the total recreational fishery. See harvest reductions in Table A2.12.

Closure	15 inches						16 inches					
	1 fish	2 fish	3 fish	4 fish	5 fish	6 fish	1 fish	2 fish	3 fish	4 fish	5 fish	6 fish
Dec 16 - Dec 31	24	11	6	4	3	1	33	21	17	15	14	13
Dec 1 - Dec 31	25	12	7	5	4	2	34	22	18	16	15	14
Nov 16 - Dec 31	26	12	8	6	5	3	34	23	19	17	16	15
Nov 1 - Dec 31	27	15	10	8	7	5	36	25	21	19	18	17
Oct 16 - Dec 31	30	18	14	12	11	9	39	28	24	22	22	20
Oct 1 - Dec 31	33	21	17	15	14	13	41	30	27	25	24	23
Sep 16 - Dec 31	37	26	23	21	20	18	45	35	32	30	29	28
Sep 1 - Dec 31	41	31	27	26	25	23	48	39	36	34	34	32
Aug 16 - Dec 31	49	39	36	35	34	33	55	47	44	43	42	41
Aug 1 - Dec 31	53	44	41	40	39	38	58	51	48	47	46	45
Jan 1 - Dec 31	73	68	66	66	65	64	76	72	70	70	69	69

*2014 data are preliminary, 2014 gig data were not available

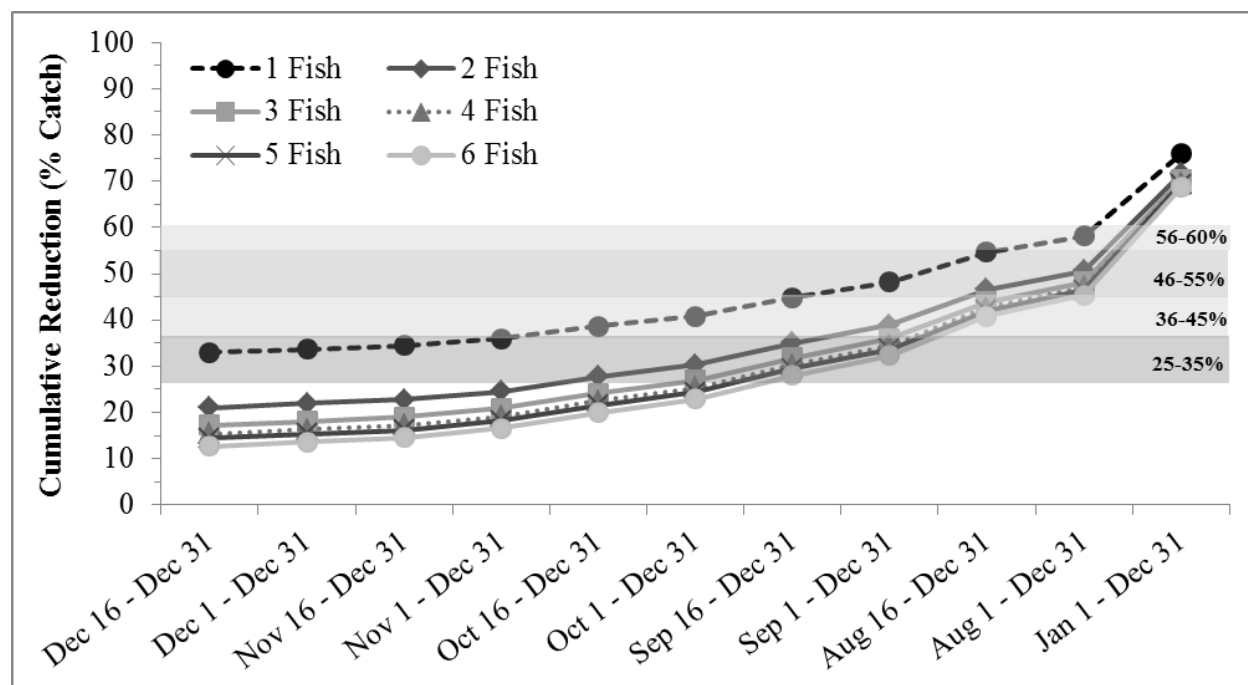


Figure 14. Catch reductions (percent) from the recreational catch by gear for season closures, recreational bag limit decreases and a 16-inch minimum size limit based on 2011-2014 recreational average.

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Combined fishery reductions

Reduction from a season closure, minimum size limit increase and recreational bag limit decrease were estimated for the total fishery. Due to the small additional reduction gained by decreasing the recreational bag limit, only a one- or two-fish recreational bag limit were included in reduction estimates. Increasing the commercial fishery size limit to 15 inches, implementing a closure Nov. 16-Dec. 31 and decreasing the recreational bag limit to one fish would result in an estimated 22% reduction (Table 22, Figure 15). To achieve an estimated 25% reduction with a minimum commercial size limit of 15 inches and one-fish recreational bag limit, a season closure of Nov. 16-May 15 would also be needed. Reductions gained from a season closure in winter and early-spring are small due to minimal flounder fishing during that time relative to other seasons. A closure period of Oct. 1-Dec. 31 combined with a 15-inch minimum size limit and a one-fish recreational bag limit was estimated to reduce catch by 52%. Increasing the minimum size limit to 16 inches with a closure Nov. 16-Dec. 31 and a two-fish recreational bag limit resulted in an estimated reduction of 32% (Table 22, Figure 16). An Oct. 1-Dec. 31 closure with a 16-inch minimum size limit and a one-fish recreational bag limit resulted in an estimated 60% reduction. Reductions were only slightly lower with a two-fish recreational bag limit instead of a one-fish recreational bag limit due to the small number of catches with more than one southern flounder. Catch reductions do not include further reductions that would be expected from an increase in gill net and pound net escape panel mesh sizes. Catch reductions were considerably lower than harvest reductions for this option due to the expected increase in dead discards (see Appendix 2 for harvest reductions). An increase in gill net and pound net escape panel mesh sizes would likely result in larger catch reductions than those shown below due to the expected smaller number of dead discards.

Table 22. Catch reductions (percent) from the combined fishery for season closure, minimum size limit increase and a one- or two-fish recreational bag limit based on 2011-2014* combined fishery average. Bolded rows include a reduction within the requested range. See harvest reductions in Table A2.13.

Closure	15 inch limit		16 inch limit	
	1 fish bag limit	2 fish bag limit	1 fish bag limit	2 fish bag limit
Nov 16-Dec 31	22	19	34	32
Nov 1-Dec 31	29	27	41	39
Oct 16-Dec 31	41	39	50	49
Oct 1-Dec 31	52	51	60	59
Sept 16-Dec 31	63	62	69	68
Sept 1-Dec 31	67	66	72	71
Aug 16-Dec 31	71	70	76	75
Aug 1-Dec 31	74	73	78	77
Jan 1 - Dec 31	91	90	92	92

*2014 data are preliminary, 2014 commercial gill net discard estimates were not available, 2014 recreational gig data were not available

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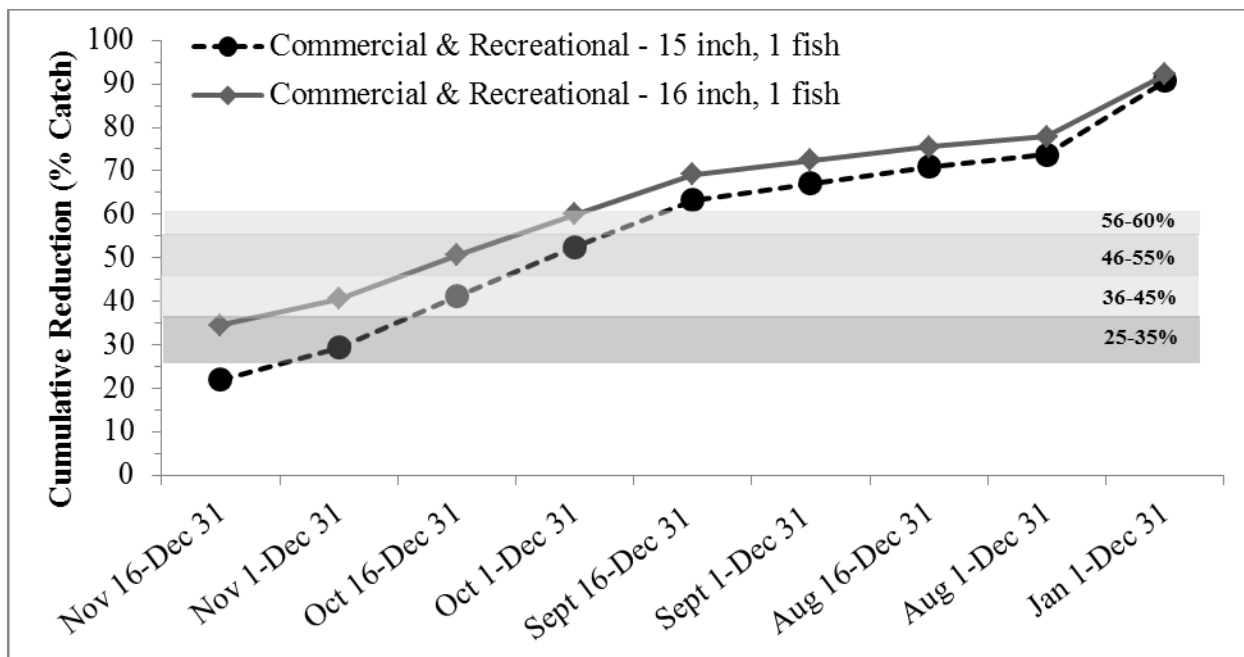


Figure 15. Catch reductions (percent) from the combined fishery catch for season closures, minimum size limit increases and a one-fish recreational bag limit based on 2011-2014 combined fishery average.

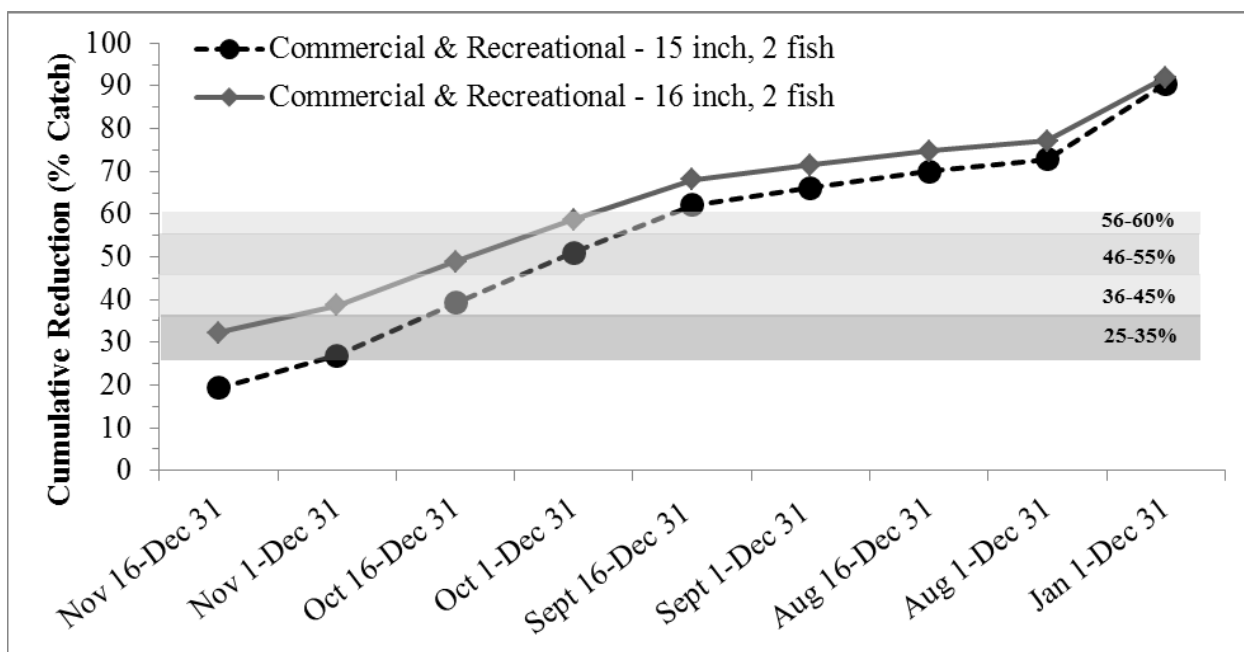


Figure 16. Catch reductions (percent) from the combined fishery catch for season closures, minimum size limit increases and a two-fish recreational bag limit based on 2011-2014 combined fishery average.

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The goal of the management options discussed in this supplement is to reduce catch within the range requested by the MFC such that southern flounder spawning stock biomass is increased. Increasing escapement directly impacts the spawning stock biomass in the short-term and may have even greater benefits in the long-term. Because there is not an approved southern flounder stock assessment to use for setting sustainable harvest levels, the reduction chosen can only be based on the degree of concern about the current state of the southern flounder stock as understood by data trends. Additionally, until a stock assessment is developed that is deemed acceptable for management of southern flounder it will not be possible to determine whether any new management measures implemented through a supplement to reduce catch have resulted in sustainable harvest levels. Further confounding appropriate harvest levels, evidence suggests southern flounder is likely one stock within the South Atlantic. Southern flounder migrating from N.C. estuarine waters often enter waters south of North Carolina's southern border where they will be susceptible to harvest in the other states' waters, possibly prior to spawning the first time. Therefore, the benefits to the spawning stock biomass achieved by reducing catch in N.C. waters will be mitigated by fishing effort and regulations in other South Atlantic states.

V. PROPOSED MANAGEMENT OPTIONS

(+ Potential positive impact of action)

(- Potential negative impact of action)

Commercial Fisheries:

1. Implement a season closure (half-month periods starting at the end of the season)
 - + Achieves reductions throughout requested range
 - + May increase the spawning stock biomass
 - + May increase harvest with possible improvements in the economic performance of the fishery in the long-term
 - + No discard mortality if all gear is removed from water
 - + Increases escapement (number of mature individuals able to spawn)
 - + Decreases opportunity for recoupment (relative to mid-season closures)
 - To avoid recoupment, harvest from any gear must cease during closure.
 - Decreases harvest with possible economic losses to the fishery
 - Continues harvest of primarily immature fish
 - Inequity in reductions by gear and area
 - Effort may increase during open seasons, diminishing the reductions
 - If any gears that catch flounder are left in the water, this will result in discard mortality.
 - If harvest is allowed for any gears during closed seasons, this will result in recoupment. Effort may increase in other fisheries resulting in unsustainable harvest levels.
 - Rule 15A NCAC 03J. 0501 states a pound net must be set 30 consecutive days to be a valid permit, potentially requiring additional NCDMF action if a season closure reduces pound net sets to less than 30 days.
 - Additional regulations will make data trends more difficult to interpret.

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2. Increase the minimum size limit (15” and 16”) with gear modifications

- + Achieves reduction within requested range at 16-inch minimum size limit
- + May increase the spawning stock biomass
- + May increase harvest with possible improvements in the economic performance of the fishery in the long-term
- + Increases the proportion of fish that are mature before they can be harvested
- + Increases escapement
- + Fishing can continue throughout year (except current December closure)
- + If proper modifications to gill nets and pound nets are made, discards will not increase.
- If minimum mesh sizes for large mesh gill nets and pound net escape panels are not increased enough, discards will increase.
- Decreases harvest with possible economic losses to the fishery
- Some regions may be impacted more than others (i.e., Albemarle Sound, Core/Back Sound, western Pamlico Sound and its tributaries).
- Some gears may be impacted more than others.
- Impacts on catches greatest in early half of the year (January-June)
- Predicted reduction may be less than actual due to recoupment once fish reach legal size
- Effort may increase in other fisheries resulting in unsustainable harvest levels.
- Additional regulations will make data trends more difficult to interpret.

3. Implement a season closure and increase the minimum size limit with gear modifications

- + Achieves reductions throughout requested range
- + May increase the spawning stock biomass
- + May increase harvest with possible improvements in the economic performance of the fishery in the long-term
- + Increases escapement
- + Shorter season closure needed to achieve similar reduction than season closure alone
- + Smaller increase in discards than minimum size limit increase alone
- + Likely smaller percentage of immature fish in the harvest
- + If proper modifications to gill nets and pound nets are made, discards will not increase.
- +/- May result in more equitable reduction among gear types than Options 1 and 2
- Decreased harvest with possible economic losses to the fishery
- Effort may increase during open seasons, diminishing the reductions
- If minimum mesh sizes for large mesh gill nets and pound net escape panels are not increased enough, discards will increase.
- Some regions may be impacted more than others (i.e., Albemarle Sound and western Pamlico Sound and tributaries).
- Impacts on catches greatest in early half of the year (January-June)
- Predicted reduction may be less than actual due to discards growing to legal size
- Fishing activity must cease during closed periods.
- If any gears that catch flounder are left in the water, this will result in discard mortality or harvest if sale of flounder is allowed.
- If the closure does not extend through the end of the season, recoupment will occur.
- Effort may increase in other fisheries resulting in unsustainable harvest levels.
- Additional regulations will make data trends more difficult to interpret.

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Recreational Fisheries:

1. Implement a season closure (half-month periods starting at the end of the season)
 - + Achieves reductions within most of requested range (complete closure required for 60%)
 - + May increase the spawning stock biomass
 - + May increase harvest with possible improvements in the economic performance of the fishery in the long-term
 - + Aug. 1 through Dec. 31 and Aug. 16 through Dec. 31 achieve requested reduction range.
 - + Closures at the end of the season (i.e., fall months) allow for escapement (number of mature individuals emigrating from estuaries to spawn).
 - Decreased harvest with possible economic losses to the fishery
 - Possible increase in catch of other managed species
 - Increased discards of southern, summer, and Gulf flounder
 - Additional regulations will make data trends more difficult to assess effectiveness.

2. Increase the minimum size limit (16")
 - + May increase the spawning stock biomass
 - + May increase harvest with possible improvements in the economic performance of the fishery in the long-term
 - + Reduces the percentage of immature fish in the harvest
 - + Increases escapement
 - Does not achieve a reduction within requested range
 - Decreased harvest with possible economic losses to the fishery
 - Increased discards of southern, summer, and Gulf flounder
 - Disproportionate impact for western Pamlico Sound and tributaries
 - Adds complexity to current regulations
 - Possible increase in catch of other managed species
 - Additional regulations will make data trends more difficult to assess effectiveness.

3. Decrease the recreational bag limit (1-5 fish per person per trip)
 - + May increase the spawning stock biomass
 - + May increase harvest with possible improvements in the economic performance of the fishery in the long-term
 - Does not achieve a reduction within requested range
 - Increased discards of southern, summer, and Gulf flounder
 - Decreased harvest with possible economic losses to the fishery
 - Possible increase in catch of other managed species
 - Additional regulations will make data trends more difficult to assess effectiveness.

2. Implement a season closure, increase the minimum size limit and decrease the recreational bag limit
 - + Achieves reductions within most of requested range
 - + May increase the spawning stock biomass
 - + May increase harvest with possible improvements in the economic performance of the fishery in the long-term
 - + Many possible combinations of reductions within requested range

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- + Shorter season closure needed to achieve similar reduction than season closure alone
- Disproportionate impact for western Pamlico Sound and tributaries
- Increased discards of southern, summer, and Gulf flounder
- Decreased harvest with possible economic losses to the fishery
- Possible increase in catch of other managed species
- Adds complexity to current regulations
- Additional regulations will make data trends more difficult to assess effectiveness.

VI. MANAGEMENT RECOMMENDATIONS

MFC Selected Management Strategy

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NCDMF

- No recommendation at this time

VII. RESEARCH RECOMMENDATIONS (From NCDMF 2014 Southern Flounder Stock Assessment)

- Retain mail survey of recreational gig survey harvest and discards. Develop methodology to validate mail survey results, possibly using dockside survey.
- Collect discard data (ages, species ratio, lengths, fates) from gears targeting southern flounder (pound net, gigs, hook and line, trawls).
- Develop and implement consistent strategies for collecting age and sex samples from commercial/recreational fisheries and independent surveys to achieve desired precision for stock assessment.
- Collect age data from estuarine trawl survey and Pamlico Sound survey to more accurately estimate YOY abundance (instead of using length cutoffs based on length frequency plot interpretations).
- Tagging study to estimate emigration (unit stock) and mortality rates.
- Expand, improve, or add inshore surveys of southern flounder to develop indices that we can be confident in for future stock assessments.
- Expand, improve or add fishery-independent surveys of the ocean component of the stock.
- Conduct studies to better understand ocean residency of southern flounder.
- Determine locations of spawning aggregations of southern flounder.
- Conduct sampling of the commercial/recreational ocean spear fishery harvest/discards.
- Re-establish a RCGL survey to obtain harvest, discard, and effort information.
- Develop spatial model to account for inshore and ocean components of the stock.

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Appendix 1. Fishery regulations by sector

Table A1.1. Recreational flounder fishery regulations

Year	Inland Waters			Ocean Waters		
	Size Limit	Bag Limit	Season	Size Limit	Bag Limit	Season
1989	13"	----	----	13"	----	----
1990	13"	----	----	13"	----	----
1991	13"	----	----	13"	----	----
1992	13"	----	----	13"	----	----
1993	13"	----	----	13"	----	----
1994	13"	----	----	14"	8	----
1995	13"	----	----	14"	8	----
1996	13"	----	----	14"	8	----
1997	13"	----	----	14.5"	10	----
1998	13"	----	----	15"	8	----
1999	13"	----	----	15"	8	----
2000	13"	----	----	15"	8	----
2001	13"	----	----	15.5"	8	5/1-5/14
2002	13"/14"*	----	----	15.5"	8	4/3-7/4
2003	13"/14"***	----	----	15"	8	----
2004	13"/14"***	----	----	14"	8	----
2005	14"	8	----	14"	8	----
2006	14"	8	----	14"	8	----
2007	14"	8	----	14.5"	8	----
2008	14"/15.5"***	8	----	14"/15.5"***	8	----
2009	14"/15"***	8	----	14"/15"***	8	----
2010	14"/15"***	8	----	14"/15"***	8	----
2011	15"	6	----	15"	6	----
2012	15"	6	----	15"	6	----
2013	15"	6	----	15"	6	----
2014	15"	6	----	15"	6	----

* 14 inch size limit implemented October 1st

** Smaller minimum size limit in western portions of Albemarle and Pamlico sounds and tributaries, and ocean and estuarine waters south of Brown's Inlet; larger minimum size limit north of Brown's Inlet in eastern estuarine and ocean waters.

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Table A1.2. Commercial flounder fishery regulations

Year	Month(s) / Day(s)	Regulation change
1979	Jan -	11-inch TL minimum size
1988	Sep -	13-inch TL minimum size
1992	Sep 1 -	Escapement panels required in pound nets in Core Sound and southeast Pamlico Sound (four panels at least six meshes high and eight meshes long)
1998	Sep 1 -	Escapement panels required in flounder pound nets statewide with a minimum mesh size of 5.5 inches, Albemarle Sound west of Alligator River exempted (NCAC 03J .0107)
1999	Dec 16 -	NMFS emergency rule closed southeastern Pamlico Sound to large mesh* gill nets due to interactions with sea turtles for the season
2000	Oct 28–Dec 31	Deep-water large mesh* gill net fishery in Pamlico Sound closed by NMFS due to sea turtle mortalities
2000	Nov 2 -	NMFS issued Incidental Take Permit (ITP) to the NCDMF for the gill net fishery. Established the Pamlico Sound Gill Net Restricted Area (PSGNRA) and imposed gill net fishery management measures.
2000	Oct 27 -	The NCDMF closed the PSGNRA to the use of large mesh* gill nets due to sea turtle interactions
2001	Sep 1–Dec 15	NMFS closed the Pamlico Sound deep water large mesh* gill-net fishery annually. The PSGNRA continued to operate under an ITP that included: permitted entry, restricted areas, a 2,000 yard limit for all gill-net operations, weekly fishermen reporting, and mandatory scientific observer coverage (Federal Rule 50 CFR Part 223).
2002	Sep 1–Dec 15	Reoccurring closure of Pamlico Sound deep water area established by NMFS (Federal Rule 50 CFR Part 223)
2002		Reoccurring regulations established for PSGNRA: open under ITP regulations until Sept 1, closed until mid-Sept, then open to 24/7 fishing for the remainder of the season unless interactions with sea turtles exceed ITP thresholds. Three inlet corridors established where large mesh* gillnets were prohibited: Oregon Inlet (OIC), Ocracoke Inlet (OC) and Hatteras Inlet Corridors (HC). Two new mainland restricted areas established. Small mesh gill nets were exempted from the permitting requirements.
2003		Three-year ITP granted for the gill-net fishery. Implemented a sea turtle observer and characterization program in PSGNRA September through December.
2005		NCDMF received a six-year ITP for the gill-net fishery with changes including increased observer coverage. The mainland portion of the Pamlico Sound was no longer required to have a permit

*large mesh gill nets are defined as ≥ 5 inch stretched mesh in the North Carolina Trip Ticket Program; beginning in 2010 with the Sea Turtle Settlement large mesh was defined as 4.5 to 6.5 inches stretched mesh

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Table A1.2 continued

Year	Month(s) / Day(s)	Regulation change
2005	Apr -	14-inch minimum size limit in estuarine waters
2005	Apr 15 -	Minimum mesh size of 5.5- inch stretched mesh for large mesh* gill nets (rule 15A NCAC 03J. 0103(a)(2))
2005	Sep 1 -	3,000-yard limit on gill nets (rule 15A NCAC 03J .0103(i)(1))
2005	Sep 1 -	Escape panels of 5.5-inch stretched mesh required in pound nets statewide (ended exemption in Albemarle Sound west of the Alligator River) (rule 15A NCAC 03J .0501(e)(2))
2005	Oct 24 -	A minimum tailbag mesh size of 4-in stretched mesh in crab trawls in western Pamlico Sound to minimize bycatch of undersized southern flounder.
2005	Dec 1–31	Reoccurring commercial flounder fishery closure (except where noted)
2006	July 1 -	Upper portions of the Neuse, Pamlico, and Pungo rivers closed to shrimp trawling and implemented a maximum combined 90 foot headrope length in the mouths of the Pamlico and Neuse rivers and all of the Bay River to minimize southern flounder bycatch (Rules 15A NCAC 03R .0114)
2007	Nov 15–Dec 15	The PSGNRA season closed due to sea turtle interactions surpassing thresholds (proclamation M-19-2007).
2007	Dec 1–15	Commercial fishery open due to multiple significant variable conditions, except gill nets 4 to 6.5 inches stretch mesh remained closed in the PSGRNA
2009	Oct 22 - Nov 30	The PSGNRA season closed due to sea turtle interactions surpassing authorized thresholds (proclamation M-24-2009).
2009	Dec 1–15	Commercial pound net fishery open due to multiple significant variable conditions
2010	May 15 -	Due to Sea Turtle Lawsuit Settlement, large mesh* gill nets were limited to use: four nights per week (Tuesday - Friday) with 15 meshes deep, a maximum of 2,000 yards north of and 1,000 yards south of Hwy 58 Bridge with 100-yards of continuous net. They are also required to have leaded bottom lines, prohibited to use floats north of the Highway 58 Bridge and must leave a space of 25-yards between sections of net. Exempted areas included western Albemarle Sound, Currituck Sound and the PSGNRA from September through November (proclamation M-8-2010)
2010	Sep 3-Oct 6	South Core Sound, Back Sound, North River and tributaries (area D1) closed to large mesh* gill nets due to sea turtle interactions with gill nets (proclamation M-16-2010)
2011	Jan 20-Mar 28	Albemarle Sound Management Area (ASMA), Pamlico Sound, Pamlico, Pungo, Bay, and Neuse Rivers and the Cape Fear River exempted from Sea Turtle Settlement measures (four day fishing week, the mesh height, lead line and float requirements, and the 100 yard continuous length limit) for large mesh* gill nets to allow for a shad harvest season (proclamation M-2-2011)

*large mesh gill nets are defined as ≥ 5 inch stretched mesh in the North Carolina Trip Ticket Program; beginning in 2010 with the Sea Turtle Settlement large mesh was defined as 4.5 to 6.5 inches stretched mesh

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Table A1.2 continued

Year	Month(s) / Day(s)	Regulation change
2011	Sep 12 -	Restrictions on large mesh* gill nets no longer required in Albemarle, Croatan, and Roanoke sounds north and west of Highway 64/264 bridges as well as Pamlico, Bay, and Neuse rivers (proclamation M-27-2011)
2011	Sep 18 -	An extra day was allowed for large mesh* gill nets south of Beaufort Inlet (proclamation M-30-2011)
2011	July 18-Oct 3	Area D1 closed to large mesh* gill nets due to turtle interactions (proclamation M-24-2011)
2012	Feb 2-Mar 28	The ASMA, Pamlico Sound, Pamlico, Pungo, Bay, and Neuse Rivers and the Cape Fear River exempted from Sea Turtle Settlement measures (four day fishing week, the mesh height, lead line and float requirements, and the 100 yard continuous length limit) for large mesh* gill nets to allow for a shad harvest season (proclamation M-6-2012).
2012	May 20 -	1,000 yards maximum large mesh* gill-net length, Beaufort Inlet to Hwy 58 Br (proclamation M-23-2012).
2012	May 20-Oct 14	Area D1 closed to large mesh* gill nets due to turtle interactions (proclamation M-23-2012). Annual closure of May 8-Oct 14 to be used for this area in future to avoid sea turtle interactions.
2012	Sep 26-Oct 15	PSGNRA closed to large mesh* gill nets due to sea turtle interactions
2012	Oct 15-Nov 30	Area D1 open to large mesh* gill nets (proclamation M-52-2012)
2012	Oct 8-Nov 30	2,000 yards maximum large mesh* gill-net length and must be present at nets by noon each day in Albemarle Sound and its tributaries (to limit sturgeon interactions and mortalities; proclamation M-49-2012)
2012	Oct 4-Nov 30	Southern portions of Croatan/Roanoke sounds subject to M-8-2010 due to turtle interactions
2013	Mar 7-	Albemarle, Currituck, Croatan, and Roanoke sounds north and west of Highway 64/264 bridges, Pamlico, Pungo, Bay, and Neuse rivers, and only in January-April for upper New and Cape Fear rivers, limit the use of large mesh* gill nets to four nights/week and 2,000 yards, except south of Beaufort Inlet allow five nights/week and maximum 1,000 yards (proclamation M-7-2013)
2013	May 8-Oct 14	Annual closure for large mesh* gill nets in area D1 (proclamation M-17-2013).
2013	Feb 7, Mar 7	Large mesh* gill net shad exemptions for the ASMA Feb 7 (proclamation M-2-2013) and Pamlico Sound and tributaries March 7 (proclamation M-7-2013).
2013	July 14-Oct 1	Use of large mesh* gill nets prohibited south of Highway 58 Bridge (area E) via proclamation M-20-2013 due to sea turtle interactions
2013	July 24-Oct 1	Use of large mesh* gill nets prohibited in Pamlico Sound/northern Core Sound due to sea turtle interactions (proclamation M-21-2013)

*large mesh gill nets are defined as ≥ 5 inch stretched mesh in the North Carolina Trip Ticket Program; beginning in 2010 with the Sea Turtle Settlement large mesh was defined as 4.5 to 6.5 inches stretched mesh

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Table A1.2 continued

2013	Sep 1–Sep 11	Areas B and E closed until ITP approved (due to PSGNRA ITP not being extended another year)
2013	Oct 15 - Nov 30	Area D1 open to large mesh* gill nets (proclamation M-33-2013).
2014	Mar 18 -	Gill nets with mesh length greater than 5 inches must be equipped with tie downs 10 yards apart and can not be within 50 yards of the shore in the Neuse, Pamlico, and Pungo Rivers. Use of gill nets 5 inches or greater is prohibited within 10 feet of any point on the shoreline while set or deployed from June to October (proclamation M-10-2014)
2014	May 5 - Sept 15	Use of large mesh* gill-nets prohibited in Internal Coastal Waters to avoid discards of red drum. Major portions of areas A and C and the New River were
2014	Sept 1 -	The remainder of area A is reopened from the red drum closure (proclamation M-25-2014).
2014	Sept 15-	The remainder of management unit C is reopened and all of management unit D2 is reopened from the red drum closure (proclamation M-29-2014).
2014	Sept 22	Management units B and E are opened to large mesh* gill nets (proclamation M-30-2014)
2014	Sep 24-Nov 2	Area E closed to large mesh* gill nets due to turtle interactions (proclamation M-31-2014), reopened via proclamation M-39-2014
2014	Oct 1-Oct 27; Oct 1-Nov 6	Area A closed to large mesh* gill nets due to turtle interactions (proclamation M-33-2014). Portions of western Albemarle Sound and Currituck reopened on Oct 27 (proclamation M-36-2014). Remainder of area A reopened Nov 6 (proclamation M-41-2014)
2014	Oct 15 - Nov 30	Area D1 open to large mesh* gill nets (proclamation M-34-2014).
2014	Oct 26-Nov 6	Shallow water portions of area B (PSGNRA) closed to large mesh* gill nets due to turtle interactions (proclamation M-37-2014), reopened via proclamation M-40-2014

*large mesh gill nets are defined as ≥ 5 inch stretched mesh in the North Carolina Trip Ticket Program; beginning in 2010 with the Sea Turtle Settlement large mesh was defined as 4.5 to 6.5 inches stretched mesh

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Appendix 2. Harvest reductions

Table A2.1 Commercial harvest reductions (percent) from the total commercial harvest for season closures based on 2011-2014* average. Bolded rows include a reduction within the requested range for the total commercial fishery.

Closure	Gill net	Pound net	Gig	Other gears	Total
Nov 16-Dec 31	1	3	<1	<1	5
Nov 1-Dec 31	5	10	1	<1	16
Oct 16-Dec 31	12	20	1	<1	34
Oct 1-Dec 31	20	29	2	<1	51
Sept 16-Dec 31	30	35	2	<1	67
Sept 1-Dec 31	34	36	3	<1	73
Aug 16-Dec 31	38	36	3	1	77
Aug 1-Dec 31	41	36	4	1	81
Jan 1-Dec 31	55	36	8	1	100

*2014 data are preliminary

Table A2.2 Recreational harvest reductions (percent) from the total recreational harvest for season closures based on 2011-2014* average. Bolded rows include a reduction within the requested range for the total recreational fishery.

Closure	Hook & Line	Gig	Total
Dec 16-Dec 31	< 1	1	1
Dec 1 - Dec 31	< 1	2	3
Nov 16 - Dec 31	1	4	4
Nov 1 - Dec 31	3	5	8
Oct 16 - Dec 31	7	7	14
Oct 1 - Dec 31	10	9	19
Sep 16 - Dec 31	17	11	28
Sep 1 - Dec 31	23	13	36
Aug 16 - Dec 31	37	15	51
Aug 1 - Dec 31	43	17	59
Jan 1 - Dec 31	72	28	100

*2014 data are preliminary, 2014 gig data were not available

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Table A2.3 Harvest reductions (percent) from the combined fishery harvest for season closures based on a 2011-2014* average. Bolded rows include a reduction within the requested range for the combined fishery total.

Closure	Commercial					Recreational			All
	Gill net	Pound net	Gig	Other	Total	Hook & line	Gig	Total	Total
Nov 16-Dec 31	1	3	< 1	< 1	4	< 1	1	1	5
Nov 1-Dec 31	4	8	< 1	< 1	13	< 1	1	1	15
Oct 16-Dec 31	10	17	1	< 1	28	1	1	2	30
Oct 1-Dec 31	17	24	1	< 1	42	2	2	3	45
Sept 16-Dec 31	25	29	2	< 1	55	3	2	5	60
Sept 1-Dec 31	28	29	2	< 1	60	4	2	6	66
Aug 16-Dec 31	31	29	3	< 1	64	6	3	9	73
Aug 1-Dec 31	34	29	3	< 1	67	7	3	10	77
Jan 1-Dec 31	45	30	7	1	83	13	5	17	100

*2014 data are preliminary

Table A2.4 Harvest reductions (percent) from combined fishery harvest for season closures by sector based on 2011-2014 average. Closures start on the dates shown and end on Dec. 31. Bolded reductions were within the requested range.

Commercial closure	Recreational closure								
	1-Jan	1-Aug	16-Aug	1-Sep	16-Sep	1-Oct	16-Oct	1-Nov	16-Nov
1-Jan	100	93	92	89	87	86	85	84	83
1-Aug	84	77	76	73	72	70	69	68	68
16-Aug	81	74	73	70	69	67	66	65	65
1-Sep	77	70	69	66	65	63	62	61	61
16-Sep	73	66	64	62	60	59	58	57	56
1-Oct	60	52	51	48	47	45	45	43	43
16-Oct	45	38	37	34	33	31	30	29	29
1-Nov	31	24	22	19	18	16	16	15	14
16-Nov	21	14	13	10	9	7	6	5	5

*2014 data are preliminary, 2014 recreational gig data were not available

Table A2.5 Harvest reductions (percent) from total commercial harvest for minimum size limit increases based on 2011-2014* commercial catch average. Bolded rows include a reduction within the requested range for the total commercial fishery.

Size limit	Gill net	Pound net	Gig	Other	Total
15 inch	16	7	2	1	27
16 inch	32	15	5	1	53

*2014 data are preliminary

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Table A2.6 Harvest reductions (percent) from total recreational harvest for minimum size limit increases based on 2011-2014* recreational catch average.

Size limit	Hook & Line	Gig	Total
16 inch	16	6	22

*2014 data are preliminary, 2014 gig data were not available

Table A2.7. Harvest reductions (percent) from the combined fishery harvest for minimum size limit increase based on 2011-2014* combined fishery average. Bolded row includes a reduction within the requested range for the combined fishery total.

Size limit	Commercial					Recreational			All
	Gill net	Pound net	Gig	Other gears	Total	Hook & line	Gig	Total	Total
15 inch	13	6	2	< 1	22	0	0	0	22
16 inch	26	13	4	1	44	3	1	4	47

*2014 data are preliminary

Table A2.8 Harvest reductions (percent) from total recreational harvest for recreational bag limit decreases based on 2011-2014* recreational catch average. Bolded row includes a reduction within the requested range for the total recreational fishery.

Bag limit	Hook & Line	Gig	Total
1 fish	24	9	33
2 fish	10	4	14
3 fish	5	2	7
4 fish	2	1	3
5 fish	1	0	1

*2014 data are preliminary, 2014 gig data were not available

This document is in DRAFT form and all parts are subject to change.

Table A2.9 Harvest reductions (percent) from the total commercial harvest for season closures and minimum size limit increases based on 2011-2014* commercial average. Bolded rows include a reduction within the requested range for the total commercial fishery.

Closure	15 inch limit	16 inch limit
Nov 16-Dec 31	26	46
Nov 1-Dec 31	35	53
Oct 16-Dec 31	49	63
Oct 1-Dec 31	62	72
Sept 16-Dec 31	75	82
Sept 1-Dec 31	79	85
Aug 16-Dec 31	82	87
Aug 1-Dec 31	85	89
Jan 1 - Dec 31	100	100

*2014 data are preliminary

Table A2.10 Harvest reductions (percent) from the total recreational harvest for season closures and 16-inch minimum size limit based on 2011-2014* recreational average. Bolded rows include a reduction within the requested range for the total recreational fishery.

Closure	16 size limit
Dec 16-Dec 31	1
Dec 1 - Dec 31	3
Nov 16 - Dec 31	4
Nov 1 - Dec 31	8
Oct 16 - Dec 31	14
Oct 1 - Dec 31	19
Sep 16 - Dec 31	28
Sep 1 - Dec 31	36
Aug 16 - Dec 31	51
Aug 1 - Dec 31	59
Jan 1 - Dec 31	100

*2014 data are preliminary, 2014 gig data were not available

This document is in DRAFT form and all parts are subject to change.

Table A2.11. Harvest reductions (percent) from the combined fishery harvest for season closures and minimum size limit increases based on 2011-2014* combined fishery average. Bolded rows include a reduction within the requested range.

Closure	15 inch limit	16 inch limit
Nov 16-Dec 31	25	50
Nov 1-Dec 31	33	55
Oct 16-Dec 31	46	63
Oct 1-Dec 31	57	71
Sept 16-Dec 31	69	79
Sept 1-Dec 31	74	82
Aug 16-Dec 31	79	86
Aug 1-Dec 31	82	88
Jan 1 - Dec 31	100	100

*2014 harvest data are preliminary, 2014 recreational gig data were not available

Table A2.12 Harvest reductions (percent) from the recreational fishery harvest for season closures, a minimum size limit increase to 16 inches, and a recreational bag limit decrease based on 2011-2014* recreational fishery average. Bolded rows include a reduction within the requested range for the total recreational fishery.

Closure	15 inches						16 inches					
	1 fish	2 fish	3 fish	4 fish	5 fish	6 fish	1 fish	2 fish	3 fish	4 fish	5 fish	6 fish
Dec 16 - Dec 31	23	10	5	3	2	1	40	29	26	24	24	23
Dec 1 - Dec 31	24	11	7	5	4	3	41	31	27	26	25	24
Nov 16 - Dec 31	26	13	8	6	5	4	42	32	28	27	26	25
Nov 1 - Dec 31	28	16	12	10	9	8	44	34	31	29	29	28
Oct 16 - Dec 31	33	21	17	16	15	14	48	38	35	34	33	33
Oct 1 - Dec 31	37	26	22	21	20	19	51	42	39	38	37	37
Sep 16 - Dec 31	44	34	31	30	29	28	56	49	46	45	44	44
Sep 1 - Dec 31	50	41	39	37	37	36	61	54	52	51	50	50
Aug 16 - Dec 31	62	56	53	52	52	51	70	65	64	63	62	62
Aug 1 - Dec 31	68	63	61	60	60	59	75	71	70	69	69	68
Jan 1 - Dec 31	100	100	100	100	100	100	100	100	100	100	100	100

*2014 data are preliminary, 2014 gig data were not available

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Table A2.13 Harvest reductions (percent) from the combined fishery catch for season closures, minimum size limit increases and a one- or two-fish recreational bag limit based on 2011-2014* combined fishery average. Bolded rows include a reduction within the requested range.

Closure	15 inch limit		16 inch limit	
	1 fish bag limit	2 fish bag limit	1 fish bag limit	2 fish bag limit
Nov 16-Dec 31	30	27	53	51
Nov 1-Dec 31	37	35	58	56
Oct 16-Dec 31	49	47	65	64
Oct 1-Dec 31	60	58	73	72
Sept 16-Dec 31	71	70	80	80
Sept 1-Dec 31	75	74	83	83
Aug 16-Dec 31	80	79	87	86
Aug 1-Dec 31	83	83	89	88
Jan 1 - Dec 31	100	100	100	100

*2014 harvest data are preliminary, 2014 recreational gig data were not available

Appendix 3. Reduction calculation methods for each option

Option 1: Implement a season closure

Commercial fishery

NC Trip Ticket daily landings were used to split monthly estimated numbers of harvested southern flounder into half-month closure periods. To calculate the catch reduction percentage, estimated average harvest and dead discards for each closed period were divided by the average annual estimated harvest and discard mortalities. The harvest reduction percentage was calculated by dividing the estimated harvest during a closed period by the average annual harvest. The only available discard or discard mortality estimates for a major commercial gear used for harvesting southern flounder was for estuarine gill nets. A generalized linear model (GLM) framework was used to predict southern flounder gill net discards by season based on NCDMF observer data. Data limitations prevented discard estimates at two week intervals (the minimum season closure period analyzed). Instead, a ratio of gill net harvest to discards was applied to harvest numbers for each potential closure period to estimate discards at two week intervals. Seasonal post-release discard mortality rates for sublegal southern flounder were derived from Smith and Scharf (2011) and adapted for use here by NCDMF staff. Post-release discard mortality rates were applied to averaged numbers of discards with a different rate used for October - June (12%) and July - September (64%). These estimates were based on gill nets fished for approximately 24 hours before removing flounder; however, portions of the state were only allowed to fish nets from one hour before sunset until one hour after sunrise to mitigate protected species interactions. It is likely discard mortality rates will be lower for nets fished for fewer hours during nighttime only. Despite this, the available rates were used because much of

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the gill net harvest occurs in areas that were allowed to fish nets for 24 hours during most of 2011-2014. Additionally, although sublegal discards released dead were included in calculating the discard ratio, the discard mortality rate only accounted for fish that became mortalities after being released alive (i.e., post-release) due to the inability to accurately estimate the portion of the mortality rate. The numbers of dead discards were added to the annual harvest and any time-periods that were closed to calculate the reduction in catch for each period. Because there were no estimates of discards available for other commercial fisheries, the only change from harvest reductions was due to the addition of gill net discards.

Recreational Fishery

Weighted post-stratified data from MRIP were placed into half month domains to estimate hook and line harvest and discards. Seasonal post-release discard mortality rates of 7% (January-June) and 11% (July-December) were applied to MRIP derived estimates of hook and line discards. These rates were based on NCDMF studies of hook and line post-release mortality of southern flounder, but were further developed by the NCDMF for the draft 2014 southern flounder stock assessment. It was assumed that the hook and line fishery would continue to operate during a season closure. It was also assumed that all southern flounder harvested on average in 2011-2014 would be caught and released during a closed season. Therefore, seasonal discard mortality rates were applied to average hook and line harvest and discards from 2011-2014 for each closed period and divide by total catch to estimate catch reductions. For the recreational gig fishery, all discards were assumed to be dead due to injuries sustained by this gear. Consequently, a discard mortality rate was not applied to gig discard estimates, instead all discards were added to gig harvest for a potential closure period and divided by total catch to estimate catch reductions.

Option 2: Increase the minimum size limit

Reductions in catch were calculated by first subtracting the estimated dead discards at size from the average harvest at size to yield the live discards resulting from an increase in the minimum size limit (Tables A3.1 and A3.2). Although the number of discards was unknown for some gears in the 2011-2014 average catch, the expected increase in discards can be estimated based on the average numbers of fish at size in 2011-2014. For example, when increasing to a 15-inch limit, the fish currently harvested at 14 inches would be caught and discarded in the future assuming no attempt is made to modify gear to reduce discards. The number of dead discards was calculated by applying a seasonal post-release discard mortality rate to these expected discards. The number of live discards was divided by the average annual catch (harvest plus dead discards) to provide the catch reduction percentage. Harvest reductions were simply the harvest that would be avoided by increasing the minimum size limit (Tables A3.1 and A3.2) divided by the annual average harvest.

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Table A3.1. Harvest and discards used to calculate catch and harvest reductions as a result of increasing minimum size limit to 15 inches. Live and dead discard estimates were calculated assuming no gear modifications to reduce discards. NA indicates gears that would not be impacted by a minimum size limit increase to 15 inches.

Estimate Type	Commercial					Recreational			All
	Gill net	Pound net	Gig	Other	Total	Hook & line	Gig	Total	Total
Harvest	138,237	62,777	21,371	4,302	226,688	NA	NA	NA	226,688
Dead Discards	42,040	14,189	10,648	2,130	69,008	NA	NA	NA	69,008
Live Discards	96,197	48,588	10,724	2,172	157,680	NA	NA	NA	157,680

*2014 data are preliminary, 2014 commercial discard and all recreational gig data were not available

Table A3.2. Harvest and discards used to calculate catch and harvest reductions as a result of increasing minimum size limit to 16 inches. Dead discard estimates were calculated assuming no gear modifications to reduce discards.

Estimate Type	Commercial					Recreational			All
	Gill net	Pound net	Gig	Other	Total	Hook & line	Gig	Total	Total
Harvest	270,876	130,735	42,479	7,191	451,281	29,168	10,215	39,382	490,664
Dead Discards	116,146	28,925	21,109	3,541	169,721	2,973	5,365	8,338	178,059
Live Discards	154,731	101,810	21,370	3,651	281,561	26,195	4,850	31,044	312,605

*2014 data are preliminary, 2014 commercial discard and all recreational gig data were not available

Commercial fishery

To calculate the catch reduction, the numbers of fish in 1-inch size bins were calculated and averaged for 2011-2014. Catch and harvest reductions were calculated for the commercial fishery based on increasing the minimum size limit to 15 inches and 16 inches from the current 14 inch limit, assuming no gear modifications to reduce discards. Expected dead discards were estimated for each commercial gear for calculating catch reductions. The seasonal post-release discard mortality rates developed for gill nets were based on fish below 14 inches (the current commercial minimum size limit); however, evidence suggests no relationship between fish size and post-release mortality rate (at least below 14 inches) (Smith and Scharf 2011). Therefore, an assumption was made that the rates would not change for fish discarded above 14 inches and the available rates were used to predict post-release discard mortality due to a minimum size limit increase. Because there were no available discard mortality estimates for other commercial gears, the seasonal gill net post-release discard rates were also applied to the expected discards for other fisheries to calculate dead discards for the entire commercial fishery as a result of raising the minimum size limit.

Recreational Fishery

Preliminary analyses demonstrate highly comparable percent reductions of southern flounder harvest for both hook and line and flounder gigging for various harvest sizes and recreational bag limits. As such, a cumulative approach is appropriate for investigating proportional harvest reduction within the recreational sector. Reductions for an imposed 16-inch minimum size limit

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were calculated by dividing the portion of catch at 15 inches by the total catch from 15 inches to the maximum size observed. Unlike the MRIP recreational hook and line survey, catches are not reported back to DMF's Mail-based Recreational gigging survey at the individual trip level but rather two-month summarizations are given. Furthermore, individual fish sizes are not collected precluding the analyses for these scenarios in the manner they were done for hook and line. To overcome the granularity issues of the mail-based survey, recreational hook and line size frequencies and catch frequencies were used as proxies for minimum size limit reductions for the gig catch.

Option 3: Decrease the recreational bag limit

Recreational fishery

Recreational bag limit analysis was calculated by determining the frequency of angler trips with each of the potential recreational bag limits below the current six-fish recreational bag limit. For each recreational bag limit option, all catch frequencies with catches higher than the recreational bag limit of interest were converted to discards. The total catch for each specific recreational bag limit was recalculated and divided by the original harvest estimate to determine the number of fish discarded due to each recreational bag limit. Unlike the MRIP recreational hook and line survey, catches are not reported back to the NCDMF mail-based recreational gigging survey at the individual trip level but rather two-month summarizations are given. Furthermore, individual fish sizes are not collected precluding the analyses for these scenarios in the manner they were done for hook and line. To overcome the granularity issues of the mail-based survey, recreational hook and line size frequencies and catch frequencies were used as proxies for recreational bag limit reductions for the gig catch. Preliminary analyses demonstrate highly comparable percent reductions of southern flounder harvest for both hook and line and flounder gigging for various harvest sizes and recreational bag limits. Because hook and line contribute much more to the recreational fishery, a cumulative approach is appropriate for investigating proportional harvest reduction within the recreational sector.

Option 4: Implement a season closure and increase the minimum size limit

Reductions for this option were calculated within each sector by using reductions from each separate measure as inputs in the following formula: $Z = X + [(1 - X) * Y]$ where X= the reduction fraction due to one measure (e.g., season closure) and Y= reduction fraction due to the other measure (e.g., minimum size limit increase), and Z = the resulting combined reduction.

Option 5: Season closure, increase the minimum size limit and decrease the recreational bag limit

Reductions for this option were calculated within each sector by using reductions from each separate measure as inputs in the following formula: $Z = X + ((1 - X) * Y) + (1 - X + ((1 - X) * Y)) * W$ where W= the reduction fraction due the one new measure (e.g., recreational bag limit decrease), X= the reduction fraction due to a second measure (e.g., season closure), Y= reduction fraction

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due to a third measure (e.g., minimum size limit increase), and Z = the resulting combined reduction.

Appendix 4. Catch reductions by gear (using catch total by gear rather than by sector or fishery)

Table A4.1 Commercial catch reductions (percent) from the catch by gear for season closures based on a 2011-2014 average. Bolded rows include a reduction within the requested range for the total commercial fishery.

Closure	Gill net	Pound net	Gig	Other gears	Total
Nov 16-Dec 31	2	9	2	1	5
Nov 1-Dec 31	10	28	7	5	16
Oct 16-Dec 31	22	56	13	9	33
Oct 1-Dec 31	37	81	18	18	50
Sept 16-Dec 31	54	98	23	25	67
Sept 1-Dec 31	62	99	31	34	72
Aug 16-Dec 31	70	99	39	42	77
Aug 1-Dec 31	75	99	46	48	81
Jan 1-Dec 31	100	100	100	100	100

*2014 data are preliminary, 2014 discard estimates were not available

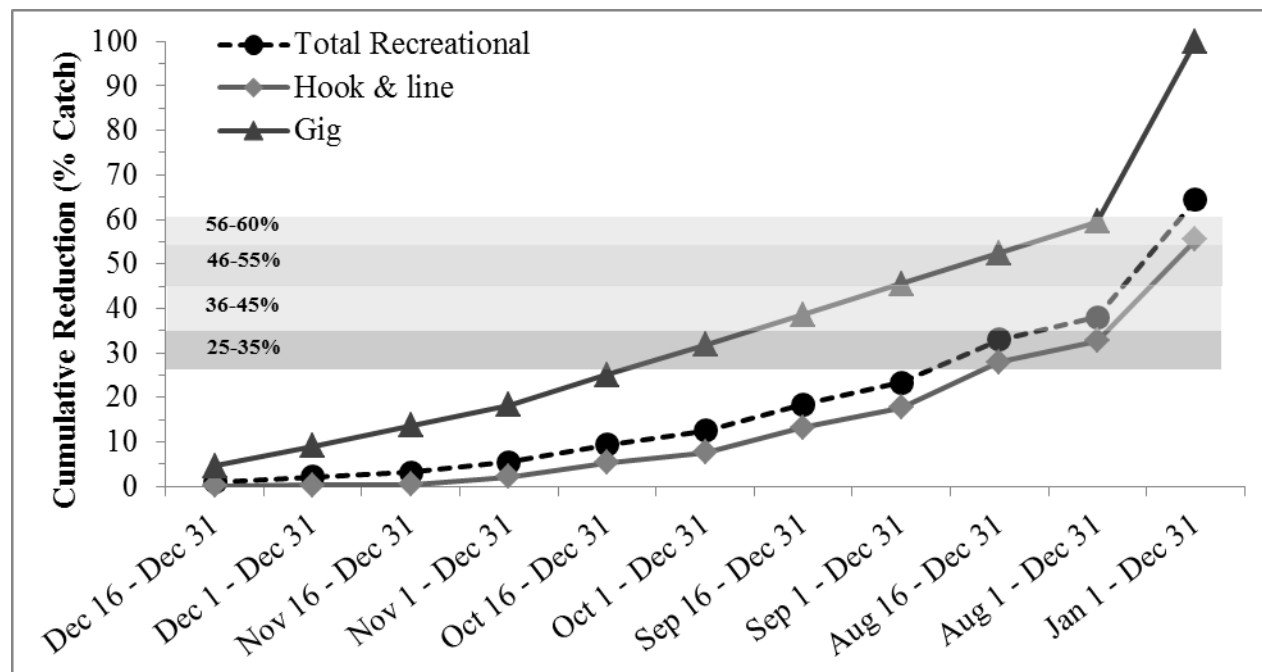


Figure A4.1. Commercial catch reductions (percent) from the catch by gear for season closures based on a 2011-2014 average.

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Table A4.2. Recreational catch reductions (percent) from recreational catch by gear for season closures based on a 2011-2014* average. Bolded rows include a reduction within the requested range for the total recreational fishery.

Closure	Hook & Line	Gig	Total
Dec 16 - Dec 31	<1	5	1
Dec 1 - Dec 31	<1	9	2
Nov 16 - Dec 31	<1	14	3
Nov 1 - Dec 31	2	18	5
Oct 16 - Dec 31	5	25	9
Oct 1 - Dec 31	8	32	13
Sep 16 - Dec 31	13	39	18
Sep 1 - Dec 31	18	45	23
Aug 16 - Dec 31	28	52	33
Aug 1 - Dec 31	33	60	38
Jan 1 - Dec 31	55	100	64

*2014 data are preliminary, 2014 gig harvest and discard data were not available

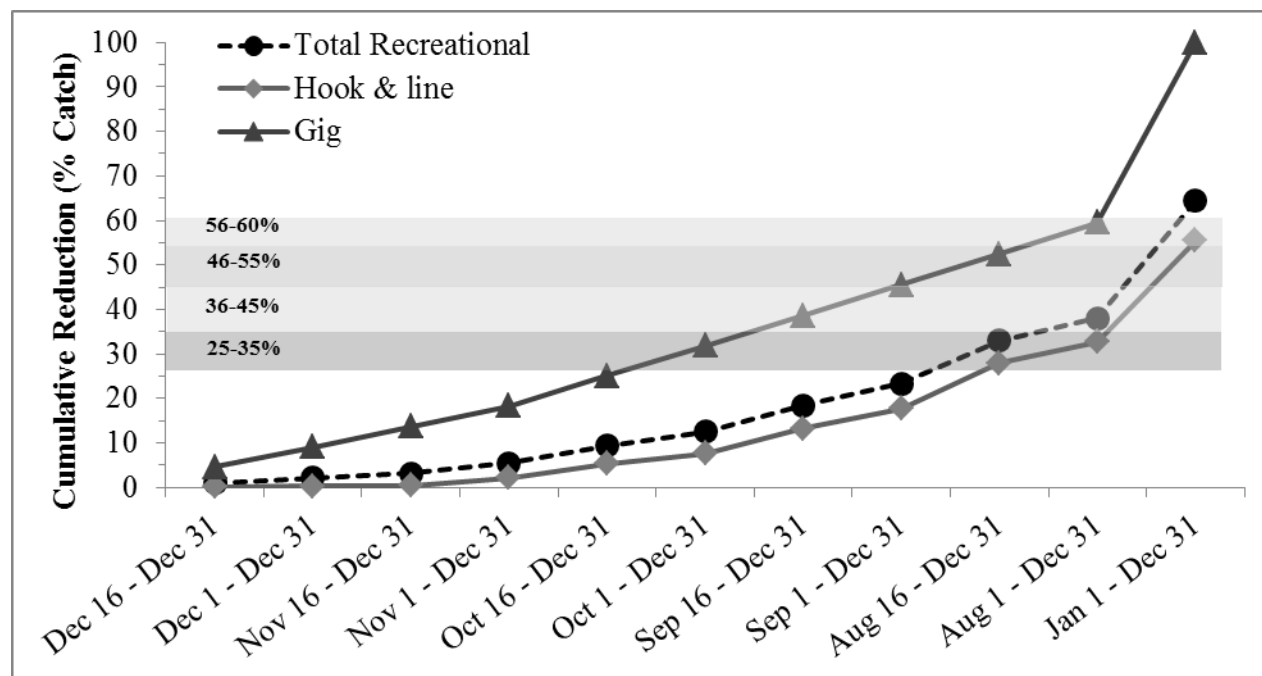


Figure A4.2. Catch reductions (percent) from recreational catch by gear for season closures based on a 2011-2014 average.

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Table A4.3. Catch reductions (percent) from catch by gear for a minimum size limit increase based on 2011-2014* commercial catch average. Bolded row includes a reduction within the requested range for the total commercial fishery.

Size limit	Gill net	Pound net	Gig	Other	Total
15 inch	20	16	15	21	18
16 inch	32	33	30	36	32

*2014 data are preliminary

Table A4.4. Catch reductions (percent) from recreational catch by gear with a 16-inch minimum size limit based on 2011-2014* recreational catch average.

Size Limit	Hook & Line	Gig	Total
16 inch	12	9	12

*2014 data are preliminary, 2014 gig data were not available

Table A4.5. Catch reductions (percent) from recreational catch by gear for recreational bag limit decreases based on 2011-2014* recreational catch average.

Bag Limit	Hook & Line	Gig	Total
1	19	37	23
2	8	13	10
3	4	6	5
4	2	3	3
5	1	1	2

*2014 data are preliminary, 2014 gig data were not available

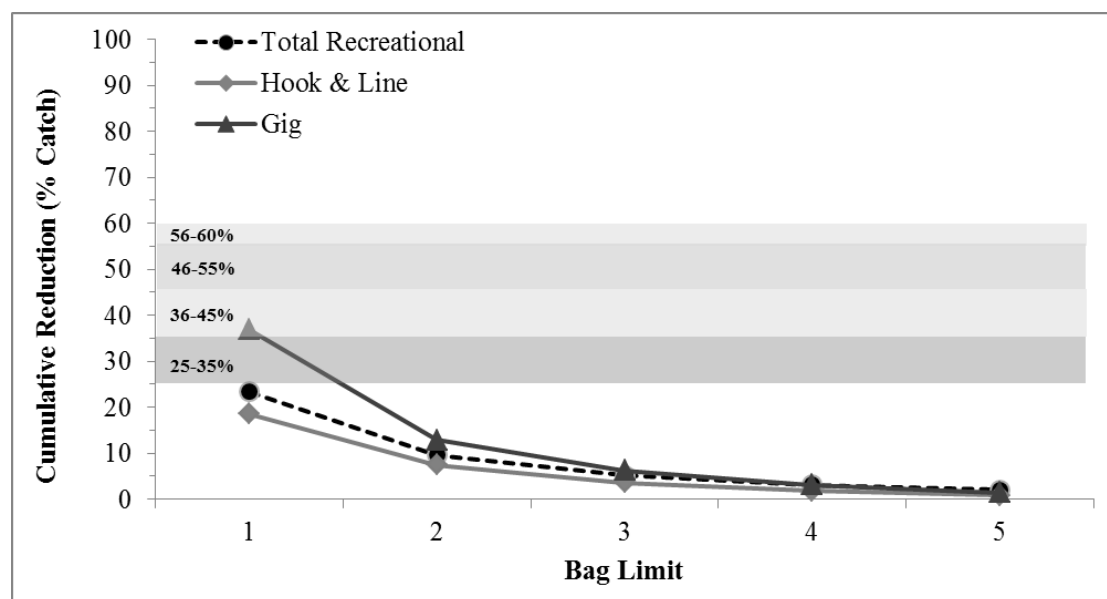


Figure A4.3. Catch reductions (percent) from recreational catch by gear for recreational bag limit decreases based on 2011-2014 average.

FISHERY MANAGEMENT PLAN REVIEW SCHEDULE (July 2014 – June 2019)
 Revised August 2014

SPECIES (Last FMP)	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019
INTERJURISDICTIONAL (6/08)					
SHRIMP (4/06)					
RIVER HERRING (9/07)					
BAY SCALLOP (11/07)					
STRIPED MULLET (4/06)					
KINGFISHES (11/07)					
HARD CLAM (6/08)					
OYSTER (6/08)					
SPOTTED SEA TROUT (2/12)					
RED DRUM (11/08)					
SOUTHERN FLOUNDER (2/13)					
ESTUARINE STRIPED BASS (2/13)					
BLUE CRAB (11/13)					

Stock Assessment of Spotted Seatrout, *Cynoscion nebulosus*, in Virginia and North Carolina Waters

2014

Prepared by

North Carolina Division of Marine Fisheries
Spotted Seatrout Plan Development Team

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EXECUTIVE SUMMARY

The North Carolina Fisheries Reform Act requires that fishery management plans be developed for the state's commercially and recreationally significant species to achieve sustainable harvest. Stock assessments are the primary tools used by managers to assist in determining the status of stocks and developing appropriate management measures to ensure their long-term viability.

An assessment of the spotted seatrout in North Carolina and Virginia was conducted using a Stock Synthesis model that incorporated data (1991–2013) collected from commercial and recreational fisheries, two fishery-independent surveys, and a tagging study. This approach differs from the previous NCDMF assessment of spotted seatrout, which was applied to data available from 1991 through 2008. The previous assessment utilized the ASAP2 statistical catch-at-age model and used data more limited in both area and time. The previous model relied primarily upon fishery-dependent data, one fishery-independent index, and also included age data from the North Carolina portion of the stock only.

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

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

The results of this assessment suggest the age structure of the spotted seatrout stock has been expanding during the last decade. However, an abrupt decline is evident in the models estimate of recruitment after 2010, although this is not mirrored in the empirical survey data. Spawning stock biomass increased to its maximum in 2007 but has since declined to close to the time series average. In 2012, the estimate of spawning stock biomass was 1,140 mt (2,513,270 lbs), which is greater than the currently defined threshold for spawning stock biomass (394 mt or 868,621 lbs); this suggests the stock is not currently overfished. Fishing mortality has varied without apparent trend, but periods of high fishing mortality seem to coincide with the decline in spawning stock biomass and may be attributed to cold stun

events. The 2012 estimate of fishing mortality was 0.40, which is less than the fishing mortality threshold (0.66), indicating that the stock is not experiencing overfishing; however, the 2012 estimate of fishing mortality (0.40) is very near the target fishing mortality of 0.42.

The stock assessment was reviewed by a panel of three independent reviewers, representing experts in stock assessment or spotted seatrout biology. The peer reviewers agreed that the assessment provided a valid basis for management for at least the next five years, given the available data and current knowledge of the species stock dynamics and fisheries. Concern was raised by one reviewer who stated “periodic mass mortalities have the potential to lead to population bottlenecks where added protections might be wise to let the population recover.” In March 2015, the NCDMF agreed that the stock assessment provided a valid basis for management.

The current 2012 spotted seatrout fishery management plan gives the N.C. Division of Marine Fisheries Director proclamation authority to close the fishery if certain conditions are met due to cold stun events. Since the completion of this recent stock assessment, two cold stun events have occurred creating uncertainty about the current status of the stock.

While the current spotted seatrout stock assessment was deemed useable for management, concern remains due to the terminal year fishing mortality level being near the target and two post assessment cold stun events (2014 and 2015). The division’s Spotted Seatrout Plan Development Team will continue to investigate modeling techniques that will potentially accommodate variable natural mortality estimates and provide more precise fishing mortality estimates.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	ii
EXECUTIVE SUMMARY	iii
TABLE OF CONTENTS.....	v
LIST OF TABLES	vi
LIST OF FIGURES	viii
1 INTRODUCTION	12
1.1 The Resource	12
1.2 Life History.....	12
1.3 Habitat.....	17
1.4 Description of Fisheries	20
1.5 Fisheries Management	22
1.6 Assessment History.....	23
2 DATA	26
2.1 Fisheries-Dependent	26
2.2 Fisheries-Independent.....	33
2.3 Evaluation of Observed Data Trends	37
3 ASSESSMENT	38
3.1 Overview.....	38
3.2 Catch Curve Analysis	39
3.3 Stock Synthesis	39
3.4 Discussion of Results.....	45
4 STATUS DETERMINATION CRITERIA.....	46
5 SUMMARY OF PEER REVIEW COMMENTS.....	46
6 RESEARCH RECOMMENDATIONS	47
7 LITERATURE CITED	49
8 TABLES	59
9 FIGURES.....	84

LIST OF TABLES

Table 1.1.	Estimated parameter values of the von Bertalanffy age-length model fit to spotted seatrout data from this and previous studies, where length is measured in centimeters.....	59
Table 1.2.	Estimated parameter values of the allometric length-weight function fit to spotted seatrout data from this and previous studies, where length is measured in centimeters and weight is measured in kilograms.....	60
Table 1.3.	Total mortality of spotted seatrout in commercial gill nets by mesh size reported in Price and Gearhart (2002).	60
Table 1.4.	Total, at-net, and delayed mortality of spotted seatrout in commercial small-mesh gill nets by season reported in Price and Gearhart (2002).....	61
Table 1.5.	At-net mortality of spotted seatrout caught in Program 915 (mesh sizes 3"-4.5" combined) by month reported in NCDMF (2012a).	61
Table 1.6.	Delayed mortality rates of spotted seatrout for high salinity (Outer Banks) and low salinity (rivers) areas reported in Price and Gearhart (2002).	61
Table 1.7.	Summary of recreational fishery release mortality estimates from a review of the literature.....	62
Table 1.8.	Regulatory history for the management of spotted seatrout in Virginia's commercial fishery since 1992 (as of March 2015).....	63
Table 1.9.	Regulatory history of the management of spotted seatrout in Virginia's recreational fishery since 1992 (as of March of 2015).	63
Table 1.10.	Proclamation history for management of spotted seatrout in North Carolina's commercial fishery since 2009 (as of October 2013).	64
Table 1.11.	Proclamation history for management of spotted seatrout in North Carolina's recreational fishery since 2009 (as of October 2013).	65
Table 2.1.	Number of spotted seatrout biological samples taken from Virginia's commercial fisheries by area, 1991–2012.	66
Table 2.2.	Number of spotted seatrout biological samples taken from North Carolina's commercial fisheries by area, 1991–2012.	67
Table 2.3.	Annual commercial fishery landings (metric tons) of spotted seatrout by state and area, 1991–2012.....	68
Table 2.4.	Numbers of spotted seatrout sampled and measured by MRIP by state, 1991–2012.....	69
Table 2.5.	Numbers of spotted seatrout ages sampled from Virginia's recreational fisheries, 2004–2012.....	70
Table 2.6.	Annual recreational fishery catches of spotted seatrout in Virginia, 1991–2012.....	71
Table 2.7.	Annual recreational fishery catches of spotted seatrout in North Carolina, 1991–2012.....	72
Table 2.8.	GLM-standardized indices of abundance used as input into the stock assessment model.....	73
Table 2.9.	Number of biological samples collected in Program 915, 2001–2012.....	74
Table 2.10.	Results of Mann-Kendall trend analyses applied to the full time period for each index. <i>P</i> -value is the one-tailed probability for the trend test. Trend indicates the direction of the trend if a statistically significant temporal trend was detected (two-tailed test: P -value < $\alpha/2$; $\alpha = 0.05$); NS = not significant....	74

Table 2.11.	Results of correlation analyses applied to the five fisheries-independent surveys used in the spotted seatrout stock assessment. An asterisk (*) indicates a significant correlation for the associated analysis ($\alpha = 0.05$).	75
Table 3.1.	Sex-specific estimates of age-specific, instantaneous natural mortality for spotted seatrout calculated using the method of Lorenzen (1996).	76
Table 3.2.	Number of spotted seatrout released in the Ellis (2013, 2014) tagging study, 2008–2012.....	76
Table 3.3.	Number of spotted seatrout recaptured in the Ellis (2013, 2014) tagging study.....	77
Table 3.4.	Summary of spotted seatrout fisheries and survey data used in the base run of the assessment model.....	78
Table 3.5.	Annual predicted recruitment, SSB, and fishing mortality (numbers-weighted, ages 1–4) from the base run of the assessment model.	79
Table 3.6.	Predicted numbers (thousands) of females at age at the beginning of the year from the base run of the assessment model.	80
Table 3.7.	Predicted numbers (thousands) of males at age at the beginning of the year from the base run of the assessment model.	81
Table 3.8.	Predicted numbers (thousands) of females at age at mid-year from the base run of the assessment model.	82
Table 3.9.	Predicted numbers (thousands) of males at age at mid-year from the base run of the assessment model.	83

LIST OF FIGURES

Figure 1.1.	Predicted von Bertalanffy age-length relation for spotted seatrout by sex.....	84
Figure 1.2.	Predicted allometric length-weight relation for spotted seatrout by sex.....	84
Figure 1.3.	Predicted maturity curve for female spotted seatrout collected in North Carolina.....	85
Figure 2.1.	Annual commercial fishery landings of spotted seatrout in Virginia and North Carolina by area, 1991–2012.....	86
Figure 2.2.	Annual length-frequency distributions of spotted seatrout sampled from Virginia and North Carolina commercial estuarine fishery landings, 1991–2006.....	87
Figure 2.3.	Annual length-frequency distributions of spotted seatrout sampled from Virginia and North Carolina commercial estuarine fishery landings, 2007–2012.....	88
Figure 2.4.	Annual length-frequency distributions of spotted seatrout sampled from Virginia and North Carolina commercial ocean fishery landings, 1992–2006. No spotted seatrout were available for sampling from the commercial ocean fishery in 1991.....	89
Figure 2.5.	Annual length-frequency distributions of spotted seatrout sampled from Virginia and North Carolina commercial ocean fishery landings, 2007–2012.....	90
Figure 2.6.	Annual age-frequency distributions of spotted seatrout sampled from Virginia and North Carolina commercial estuarine fishery landings by sex, 1991–2006.....	91
Figure 2.7.	Annual age-frequency distributions of spotted seatrout sampled from Virginia and North Carolina commercial estuarine fishery landings by sex, 2007–2012.....	92
Figure 2.8.	Annual age-frequency distributions of spotted seatrout sampled from Virginia and North Carolina commercial ocean fishery landings by sex, 1991–2006.....	93
Figure 2.9.	Annual age-frequency distributions of spotted seatrout sampled from Virginia and North Carolina commercial ocean fishery landings by sex, 2007–2012.....	94
Figure 2.10.	Annual commercial gill-net estuarine fishery dead discards of spotted seatrout in North Carolina, 2004–2012.....	95
Figure 2.11.	Annual length-frequency distributions of spotted seatrout sampled from North Carolina commercial gill-net estuarine fishery discards, 2004–2012.	95
Figure 2.12.	Annual recreational fishery harvest (Type A+B1) of spotted seatrout in Virginia and North Carolina, 1991–2012.	96
Figure 2.13.	Annual recreational fishery harvest (Type A+B1) and live releases (Type B2) of spotted seatrout in Virginia and North Carolina, 1991–2012.....	96
Figure 2.14.	Annual recreational fishery dead discards of spotted seatrout in Virginia and North Carolina, 1991–2012.	97
Figure 2.15.	Annual length-frequency distributions of spotted seatrout sampled from Virginia and North Carolina recreational fishery landings, 1991–2006.....	98
Figure 2.16.	Annual length-frequency distributions of spotted seatrout sampled from Virginia and North Carolina recreational fishery landings, 2007–2012.....	99

Figure 2.17. Annual age-frequency distributions of spotted seatrout sampled from Virginia's recreational fishery landings by sex, 2004–2012.....	100
Figure 2.18. Locations of core stations sampled by NCDMF Program 120.....	100
Figure 2.19. GLM-standardized index of relative abundance for age-0 spotted seatrout collected from Program 120 during June and July, 2004–2012. Error bars represent ± 1 standard error.	101
Figure 2.20. The sample regions and grid system for the Pamlico Sound portion of NCDMF Program 915.....	101
Figure 2.21. The sample regions and grid system for the Neuse River portion of NCDMF Program 915.....	102
Figure 2.22. The sample regions and grid system for the Pamlico and Pungo river portions of NCDMF Program 915.	102
Figure 2.23. The sample regions and grid system for the Southern District portion of NCDMF Program 915.....	103
Figure 2.24. GLM-standardized index of relative abundance for spotted seatrout collected from Program 915 during spring (May–June), 2003–2012. Error bars represent ± 1 standard error.....	104
Figure 2.25. GLM-standardized index of relative abundance for spotted seatrout collected from Program 915 during summer (July–August), 2003–2012. Error bars represent ± 1 standard error.	104
Figure 2.26. GLM-standardized index of relative abundance for spotted seatrout collected from Program 915 during fall (September–November), 2003–2012. Error bars represent ± 1 standard error.	105
Figure 2.27. GLM-standardized index of relative abundance for spotted seatrout collected from Program 915 during spring (May–June) in the southern sampling stations, 2008–2012. Error bars represent ± 1 standard error.	105
Figure 2.28. Annual length-frequency distributions of spotted seatrout collected by NCDMF Program 915 during spring (May–June), 2003–2012.....	106
Figure 2.29. Annual length-frequency distributions of spotted seatrout collected by NCDMF Program 915 during summer (July–August), 2003–2012.	107
Figure 2.30. Annual length-frequency distributions of spotted seatrout collected by NCDMF Program 915 during fall (September–November), 2003–2012.	108
Figure 2.31. Annual length-frequency distributions of spotted seatrout collected by NCDMF Program 915 during spring (May–June) in the southern sampling stations, 2008–2012.	109
Figure 2.32. Annual age-frequency distributions of spotted seatrout collected by NCDMF Program 915 during spring (May–June) by sex, 2001–2012.....	110
Figure 2.33. Annual age-frequency distributions of spotted seatrout collected by NCDMF Program 915 during summer (July–August) by sex, 2001–2012.	111
Figure 2.34. Annual age-frequency distributions of spotted seatrout collected by NCDMF Program 915 during fall (September–November) by sex, 2001–2012.	112
Figure 2.35. Annual age-frequency distributions of spotted seatrout collected by NCDMF Program 915 during spring (May–June) in the southern sampling stations by sex, 2008–2012.	113
Figure 3.1. Catch curve estimates of instantaneous total mortality for true cohorts.....	114
Figure 3.2. Catch curve estimates of instantaneous total mortality for synthetic cohorts...	114

Figure 3.3.	Comparison of total mortality rates estimated by catch curves and Heincke’s method for true cohorts.....	115
Figure 3.4.	Comparison of total mortality rates estimated by catch curves and Heincke’s method for synthetic cohorts.....	115
Figure 3.5.	Annual estimates of age-0 recruitment from the base run of the assessment model, 1994–2012. Error bars represent +/- 1 standard deviation.....	116
Figure 3.6.	Annual estimates of spawning stock biomass from the base run of the assessment model, 1994–2012. Error bars represent +/- 1 standard deviation.	116
Figure 3.7.	Annual estimates of fishing mortality (numbers-weighted, ages 1–4) from the base run of the assessment model, 1994–2012. Error bars represent +/- 1 standard deviation. Circles indicate years associated with known cold-stun events.	117
Figure 3.8.	Predicted selectivity curves for the fishing fleets from the base run of the assessment model.....	117
Figure 3.9.	Predicted selectivity curves for the fisheries-independent surveys from the base run of the assessment model.	118
Figure 3.10.	Observed and predicted values for the Program 120 index of age-0 relative abundance from the base run of the assessment model.	118
Figure 3.11.	Observed and predicted values for the Program 915 spring (May–June) index of relative abundance from the base run of the assessment model.	119
Figure 3.12.	Observed and predicted values for the Program 915 summer (July–August) index of relative abundance from the base run of the assessment model.	119
Figure 3.13.	Observed and predicted values for the Program 915 fall (September–November) index of relative abundance from the base run of the assessment model.....	120
Figure 3.14.	Observed and predicted values for the Program 915 southern (May–June) index of relative abundance from the base run of the assessment model.	120
Figure 3.15.	Annual predicted catchability for the Program 120 index of age-0 relative abundance from the base run of the assessment model.	121
Figure 3.16.	Annual predicted catchability for the Program 915 spring (May–June) index of relative abundance from the base run of the assessment model.	121
Figure 3.17.	Annual predicted catchability for the Program 915 summer (July–August) index of relative abundance from the base run of the assessment model.	122
Figure 3.18.	Annual predicted catchability for the Program 915 fall (September–November) index of relative abundance from the base run of the assessment model.....	122
Figure 3.19.	Annual predicted catchability for the Program 915 southern (May–June) index of relative abundance from the base run of the assessment model.	123
Figure 3.20.	Observed and predicted length-frequency distributions for commercial estuarine landings from the base run of the assessment model.	124
Figure 3.21.	Observed and predicted length-frequency distributions for commercial estuarine dead discards from the base run of the assessment model.	125
Figure 3.22.	Observed and predicted length-frequency distributions for commercial ocean landings from the base run of the assessment model.....	126
Figure 3.23.	Observed and predicted length-frequency distributions for recreational landings from the base run of the assessment model.....	127

Figure 3.24. Observed and predicted length-frequency distributions for the spring component of Program 915 from the base run of the assessment model.....	128
Figure 3.25. Observed and predicted length-frequency distributions for the summer component of Program 915 from the base run of the assessment model.....	129
Figure 3.26. Observed and predicted length-frequency distributions for the fall component of Program 915 from the base run of the assessment model.....	130
Figure 3.27. Observed and predicted length-frequency distributions for the southern component of Program 915 from the base run of the assessment model.....	131
Figure 3.28. Observed and predicted tag recaptures aggregated across tag groups.	132
Figure 3.29. Sensitivity of model-predicted (A) SSB and (B) fishing mortality to removal of survey data (indices and associated biological data).	133
Figure 3.30. Sensitivity of model-predicted (A) SSB and (B) fishing mortality to removal of length data.....	134
Figure 3.31. Sensitivity of model-predicted (A) SSB and (B) fishing mortality to removal of tag-recapture data.	135
Figure 3.32. Sensitivity of model-predicted (A) SSB and (B) fishing mortality to shape of selectivity curve for the commercial fisheries.	136
Figure 3.33. Sensitivity of model-predicted (A) SSB and (B) fishing mortality to assumption of survey catchabilities.	137
Figure 3.34. Sensitivity of model-predicted (A) SSB and (B) fishing mortality to a range of steepness values.	138
Figure 3.35. Model-predicted (A) SSB and (B) fishing mortality from the retrospective analysis.....	139
Figure 3.36. Comparison of fishing mortality rates estimated from the base run of the assessment model to those estimated by Ellis (2013, 2014).....	140
Figure 3.37. Comparison of predicted (A) SSB and (B) fishing mortality from this and previous (2009) assessment.	141
Figure 4.1. Annual predicted spawning stock biomass compared to estimated $SSB_{\text{Threshold}}$ ($SSB_{20\%}$) and SSB_{Target} ($SSB_{30\%}$).	142
Figure 4.2. Annual predicted fishing mortality rates (numbers-weighted, ages 1–4) compared to estimated $F_{\text{Threshold}}$ ($F_{20\%}$) and F_{Target} ($F_{30\%}$).	142

1 INTRODUCTION

1.1 The Resource

Spotted seatrout (*Cynoscion nebulosus*), also known as speckled trout, is a member of the family Sciaenidae (drums), which includes weakfish (*C. regalis*), spot (*Leiostomus xanthurus*), kingfishes or sea mullet (*Menticirrhus* spp.), Atlantic croaker (*Micropogonias undulatus*), black drum (*Pogonias cromis*), and red drum (*Sciaenops ocellatus*). This family of fishes is highly sought after in commercial and recreational fisheries. Spotted seatrout have two other species within its genus found in Virginia's and North Carolina's waters, weakfish (grey trout) and silver seatrout (*C. nothus*). Spotted seatrout can be distinguished from the other two species by the circular specks or spots on its body, dorsal fin, and caudal fin.

Spotted seatrout are found from Massachusetts to Mexico (Manooch 1984). Spotted seatrout have distinct stocks along Florida's Atlantic Coast and in the Gulf of Mexico (GOM; Wilson et al. 2002; Wiley and Chapman 2003; Ward et al. 2007; Anderson and Karel 2009, 2010; Seyoum et al. 2014); however, no studies on stock discrimination have been conducted in North Carolina. The Florida and GOM stocks are managed as distinct units and were established based on tagging and genetic studies. A tagging program for spotted seatrout was completed by North Carolina State University in 2013 and showed movement of fish between North Carolina and Virginia (Ellis 2013). North Carolina State University is furthering research on stock structure with a genetic component that began on July 1, 2014. The NCDMF is continuing the tagging program as well.

1.2 Life History

1.2.1 Stock Definitions

It is widely believed that most spotted seatrout remain in their natal estuary throughout their life cycle, particularly in the southern part of their range (Iversen and Tabb 1962; Music 1981; Baker et al. 1986; Bryant et al. 1989; Baker and Matlock 1993; Wiley and Chapman 2003). Unfortunately, there have been no otolith microchemistry or genetic studies in North Carolina to examine this; however, there has been an increase in tagging efforts to verify this trend and determine migration patterns. Results from two spotted seatrout tagging projects conducted in bordering states showed that 64% of fish tagged in Virginia and 79% of those tagged in South Carolina were recaptured within the same general area (Bain and Lucy 1996, 1997; Bain et al. 1998; Lucy et al. 1999, 2000; Lucy and Bain 2001, 2002, 2003, 2005, 2006, 2007; R. Wiggers, SCDNR, personal communication). However, Virginia's data also indicated that an average of 15% of the spotted seatrout that were recaptured from 1995 to 2006 were recaptured along the North Carolina coast as far south as Wrightsville Beach. The South Carolina study had less than one percent of the recaptured fish caught in North Carolina. Ellis (2013) tagged 6,582 spotted seatrout in Virginia and North Carolina during 2009–2013; a total of 553 tags were returned resulting in an 8.4% reporting rate. Ellis found less than 10% of fish tagged in North Carolina were recaptured outside of North Carolina; most recaptures outside of North Carolina occurred in Chesapeake Bay, Virginia (9.4%) and fewer were recaptured in South Carolina (0.4%). Information from genetic stock identification is not available at this time. The apparent migration of spotted seatrout from Virginia to North Carolina may indicate a tendency for spotted seatrout to travel south to

avoid colder winter temperatures since most recaptures in North Carolina occurred in the fall. Given the relatively high mixing rate of spotted seatrout between North Carolina and Virginia, the unit stock for this assessment encompassed all spotted seatrout within North Carolina and Virginia waters. South Carolina was not included due to the low mixing rates with North Carolina.

1.2.2 Movements & Migration

As with many estuarine and marine fish in North Carolina, spotted seatrout have distinct seasonal migrations. During the winter, spotted seatrout migrate to deeper, warmer water. As the waters warm in the summer, seatrout return to oyster beds and shallow bays and flats (Daniel 1988). Although there is distinct seasonal migration, movements north in the spring and southern movements in the fall, spotted seatrout have considerable residency based on tag return studies, with individuals usually traveling less than 20 miles (Brown-Peterson et al. 2002; Ellis 2013). A coast-wide stock assessment of spotted seatrout has not been conducted given the largely non-migratory nature of the species and the lack of data on migration where it does occur (ASMFC 2008). Due to its recreational importance, spotted seatrout were selected as a species for recreational tagging programs in Virginia and South Carolina. Although South Carolina continues to tag spotted seatrout, fishermen are discouraged from tagging these fish due to low tag return numbers. Virginia still tags spotted seatrout but continues to accumulate returns at the low reporting rate of only 3% (Lucy et al. 2007). Most spotted seatrout tagged by the South Carolina Marine Game Fish Tagging Program and Virginia Game Fish Tagging Program remained within the same estuary (R. Wiggers, South Carolina Department of Marine Resources, personal communication; J. Lucy, Virginia Institute of Marine Science, personal communication). Only two fish out of the 350 recaptured spotted seatrout migrated from South Carolina to North Carolina (R. Wiggers, personal communication). Spotted seatrout tagged in Virginia had a higher portion of the recaptures in North Carolina (15% of the 227 recaptured; J. Lucy, personal communication). This led to the decision to incorporate Virginia in the unit stock for this spotted seatrout fishery management plan. The spotted seatrout that were recaptured in North Carolina were generally captured during the fall and winter when the fish had a distinct southerly migration. Ellis (2013) tagged 6,582 spotted seatrout in Virginia and North Carolina during 2009–2013; a total of 553 tags were returned resulting in an 8.4% reporting rate. Ellis found less than 10% of fish tagged in North Carolina travelled outside of North Carolina; most of those recaptured outside of North Carolina occurred in Chesapeake Bay, Virginia (9.4%) and fewer were recaptured in South Carolina (0.4%).

1.2.3 Age/Size

Spotted seatrout are medium-sized fish with a maximum size of 102 cm (40.0 inches) and 7.71 kg (17.0 lb; Froese and Pauly 2008). North Carolina's state record was a 5.56-kg (12-lb 4-ounce) fish caught in 1961. The annual average size of spotted seatrout landed in the North Carolina recreational fishery between 1991 and 2013 ranged from 36.1 to 44.7 cm (14.2 to 17.6 inches); in the commercial fishery, annual average length ranged from between 38.1 and 45.7 cm (15.0 to 18.0 inches). The maximum observed length in North Carolina's recreational fishery was 91.4 cm (36.0 inches) while the maximum observed length in the commercial fishery was 78.8 cm (31.0 inches). The maximum otolith-based age of spotted seatrout has been reported to be 9 years old in Virginia (Ihde and Chittenden 2003), 9 years old in North Carolina, 7 years old in South Carolina (de Silva, unpublished), 8 years old in

Georgia (GACRD 2003), and 9 years old in Florida (Murphy et al. 2006). Although the oldest individual spotted seatrout observed in many studies was male (Moffett 1961; Maceina et al. 1987; Colura et al. 1994; Murphy and Taylor 1994; DeVries et al. 1997), both female and male spotted seatrout have been aged up to age 9 in North Carolina.

1.2.4 Growth

Following the first winter, male spotted seatrout attain an average of 24.6 cm (9.70 inches) in length and females reach an average of 32.5 cm (12.8 inches) in length. Growth rate begins to decrease with age in North Carolina reaching an asymptote by age 4. The predicted average maximum size for spotted seatrout in North Carolina is 67.1 cm (26.4 inches) for males and 77.5 cm (30.5 inches) for females.

Available otolith-based annual age data (raw data) were fit with a von Bertalanffy age-length model to estimate the model parameters for both male and female spotted seatrout. Estimates of L_{∞} , K , and t_0 were within the range of estimates from previous studies for both sexes (Table 1.1; Figure 1.1).

Parameters of the allometric length-weight relationship were also estimated in this study. The relation of fork length in centimeters to weight in kilograms (raw data) was modeled for males and females separately. The estimated parameters from this and previous studies are presented in Table 1.2. Plots of the observed and predicted values from this study are shown in Figure 1.2.

1.2.5 Reproduction

The spawning season for spotted seatrout varies depending on location (Texas: Brown-Peterson et al. 1988; Mississippi: Brown-Peterson et al. 2001; Gulf of Mexico estuaries: Brown-Peterson et al. 2002; South Carolina: Roumillat and Brouwer 2004; Florida: Lowerre-Barbieri et al. 2009) and peaks around the full moon (Tucker and Faulkner 1987; McMichael and Peters 1989). Virginia spotted seatrout spawn from May through August with peaks in the gonadosomatic index in May and July (Brown 1981). The spawning season in North Carolina is from April to October with a peak in May through June (Burns 1996). Spotted seatrout spawning season in Florida varies by location but generally runs from March to October with a peak in May (Brown-Peterson et al. 2002; Lowerre-Barbieri et al. 2009). The spawning period is generally within the first few hours after sunset (Luczkovich et al. 1999). During the peak of the season, older spotted seatrout (>3 years old) spawn approximately every two days while younger spotted seatrout (ages 0 and 1) spawn approximately every 4 days (Roumillat and Brouwer 2004), though spawning frequency can vary by location and time of year (Brown-Peterson et al. 2001, 2002). Estimates of fecundity for spotted seatrout range from 3 to 20 million ova per year depending on age, length, and water temperature (Nieland et al. 2002; Roumillat and Brouwer 2004; Murphy et al. 2011); however, fecundity estimates specific to North Carolina are not available at this time. Spawning takes place on or near seagrass beds, sandy banks, natural sand, shell reefs, near the mouths of inlets, and off the beach (Daniel 1988; Brown-Peterson et al. 2002).

Temperature and salinity have an influence on the reproductive output of female spotted seatrout. Temperature and salinity in spawning areas can vary, with temperature ranging from 15 to 31°C and salinity ranging from 18 to 35 ppt (Brown-Peterson et al. 1988; McMichael and Peters 1989; Walters 2005). When water temperatures exceed 30°C, the spawning season can be reduced (Jannke 1971). However, more recent work determined

salinity was the most probable factor for differences in spawning season, spawning frequency, and batch fecundity between GOM estuaries, particularly low salinity may shorten spawning seasons and decrease spawning frequency and batch fecundity (Brown-Peterson et al. 2002).

Maturity of female spotted seatrout was estimated using data collected from various NCDMF fisheries-dependent and -independent programs. Maturity at length (M_l) was modeled as:

$$M_l = \frac{1}{1 + e^{\alpha(l-\beta)}}$$

where l is length, α is the slope, and β is the inflection point.

The parameters α and β were estimated via logistic regression. The estimated value for α was -0.044 and the estimated value for β was 27.0 cm (Figure 1.3).

1.2.6 Mortality

1.2.6.1 Natural Mortality

Ellis (2014) conducted the first comprehensive spotted seatrout tag-return study in North Carolina waters with the objective of quantifying mortality and movement. Estimates of bimonthly natural mortality ranged from 0.062 to 2.527 and varied by season, while annual estimates of natural mortality ranged from 1.109 to 3.837. Ellis (2014) found natural mortality was responsible for 49.1%–96.9% of total mortality based on bimonthly estimates and 81%-92% of total mortality based on annual estimates. The importance of natural mortality compared to fishing mortality was further supported by an acoustic telemetry study. Natural mortality was generally highest during periods of cold temperatures when water temperatures were below 5°C, with the highest estimate of natural mortality ($M = 2.527$) occurring in November/December 2010 (Ellis 2014). Estimates of M from Ellis (2014) were particularly high during the winters of 2009/2010 and 2010/2011, periods which coincided with reports of cold-stunned spotted seatrout following rapid decreases in temperature throughout the state.

1.2.6.2 Discard Mortality

Commercial

An extensive literature review revealed limited existing information on mortality estimates from gill-net fisheries. However, there has been some research from the NCDMF examining the mortality of spotted seatrout in North Carolina associated with small mesh gill nets (Price and Gearhart 2002).

During the time period covered by the previous assessment, the size limit was 12 inches. Given the mesh sizes in gears used by the commercial fishery, it was assumed that all spotted seatrout caught were kept and there were no discards. However, the size limit was increased to 14 inches following the last assessment, and a discard mortality of 60% was estimated for the calculation of harvest reduction scenarios based on results reported by Price and Gearhart (2002). Total mortalities reported by Price and Gearhart (2002) were between 66 and 90% depending on mesh size, season, and salinity (Table 1.3). Set gill nets make up a large portion of the landings in the spotted seatrout commercial fishery, but other major gears such as runaround gill nets may not have as high mortality, so the previous PDT decided to use an adjusted rate of 60% to account for this.

Price and Gearhart (2002) and additional NCDMF data from the NCDMF Fishery-Independent Gill-Net Survey (Program 915; NCDMF 2012a) also showed that time of year may be a significant factor affecting mortality of spotted seatrout (Tables 1.4 and 1.5). Mortalities appear higher during spring/summer when water temperatures are warmer and dissolved oxygen levels are lower than in the fall/winter months.

Results of the Price and Gearhart (2002) study suggest that salinity (outer banks or river sites), dissolved oxygen (correlated with time of year), and mesh size significantly affect the survivability of spotted seatrout captured in gill nets (Table 1.6). Average salinity was 19 ppt for the outer banks and 10 ppt for the river sites. Total gill-net mortality was calculated as at-net mortality plus delayed mortality. Unfortunately, the study only reported delayed mortality for the different salinity areas, so it is not possible to get an estimate of total mortality necessary for assessment use.

Mortality was higher at outer banks sites, which suggests a decreased salinity tolerance for these fish (Table 1.6). Overall delayed mortality averaged 30% in the study, but these are likely overestimates due to the confounding factors of handling, transport, confinement, and tagging stress that may play a role in the observed mortality of these fishes (Price and Gearhart 2002).

Recreational

Release mortality is likely a significant source of mortality on spotted seatrout in North Carolina since Type B2 releases have accounted for an increasing percentage of the overall catch in recent years (Jensen 2009). Several hook-and-line release mortality studies have been conducted on spotted seatrout throughout the Atlantic and Gulf coasts where estimates of mortality varied greatly and ranged from 4.6% up to 55.6% (Matlock and Dailey 1981; Hegen et al. 1983; Matlock et al. 1993; Murphy et al. 1995; Duffy 1999; Duffy 2002; Gearhart 2002; Stunz and McKee 2006; Brown 2007; Table 1.7).

Two of the studies were conducted by NCDMF in North Carolina waters: Gearhart (2002) found a hooking mortality rate of 14.8%, whereas Brown (2007) arrived at a rate of 25.2%. It was noted that Brown (2007) was limited geographically having fished only in the Neuse River. In addition, this study had problems with low dissolved oxygen in the holding pens resulting in deaths not associated with hooking. It was found that these fish were included in the calculation of hooking mortality, causing an inflated rate. In comparison, Gearhart (2002) covered a wider geographic range in North Carolina at river (low salinity) and outer banks (high salinity) sites from Pamlico, Core, and Roanoke sounds between June 2000 and August 2001.

The previous spotted seatrout PDT felt that the hooking mortality rate of 25.2% from Brown (2007) was too high, particularly given the dissolved oxygen problems and questioned whether the overall rate of 14.8% from Gearhart (2002) was also too high. Gearhart (2002) stated that there may be a regional or salinity effect, and future stock assessments may want to consider applying separate mortality rates to fish caught in low versus high salinity areas; although neither location nor salinity were significant factors in the presence or level of bleeding and length in the resulting logistic equation used to identify significant factors associated with hooking mortality.

Ultimately, the previous spotted seatrout assessment (Jensen 2009) applied separate rates to fish caught in low versus high salinity areas based on MRFSS data. The MRFSS estimates

cannot be directly separated into regions based on salinity; therefore, raw intercept data from the MRFSS survey were used to calculate a ratio of observed catch based on county of landing in low salinity areas (Pamlico, Craven, Hyde—excluding Ocracoke, Beaufort, and Currituck counties) versus high salinity areas (Dare, Carteret, Onslow, Pender, New Hanover, and Brunswick counties). The total catch was weighted by the unadjusted mortality rates for low (19.4%) and high (7.3%) salinity sites as reported by Gearhart (2002) and divided by the combined total catch to obtain an overall release mortality rate of 10% for use in the last stock assessment. This rate is consistent with the rates used in previous spotted seatrout stock assessments from South Carolina (Zhao and Wenner 1995) and Georgia (Zhao et al. 1997)

1.2.7 Food & Feeding Habits

Spotted seatrout have ontogenetic changes in their diet (Holt and Holt 2000). Spotted seatrout less than 1.5 inches consume copepods as the primary prey. Fish between 1.5 and 5.5 inches consume mysids, amphipods, polychaetes, and shrimp. These juvenile spotted seatrout have considerable dietary overlap with juvenile red drum and tend to inhabit similar areas. Spotted seatrout larger than 5.5 inches become one of the top predators in estuaries where they feed on a variety of fishes and shrimp (Daniel 1988; McMichael and Peters 1989).

1.3 Habitat

1.3.1 Overview

Spotted seatrout make use of a variety of habitats during their life history with variations in habitat preference due to location, season, and ontogenetic stage. Although primarily estuarine, spotted seatrout use habitats throughout estuaries and occasionally the coastal ocean. Spotted seatrout are found in most habitats identified by the North Carolina Coastal Habitat Protection Plan (CHPP) including water column, wetlands, submerged aquatic vegetation (SAV), soft bottom, and shell bottom (Street et al. 2005). Each habitat is part of a larger habitat mosaic, which plays a vital role in the overall productivity and health of the coastal ecosystem. Additionally, these habitats function to provide the appropriate physicochemical and biological conditions necessary to maintain and enhance the spotted seatrout population. Protection of each habitat type is therefore critical to the sustainability of the spotted seatrout stock. Information on the ecological value of each of these habitats to spotted seatrout and their current condition is provided below.

1.3.2 Spawning Habitat

Spotted seatrout spawning is generally limited to the waters within the confines of the estuary. Peak spawning activity occurs at temperatures between 21 and 29°C and at salinities typically greater than 15 ppt (ASMFC 1984; Mercer 1984; Saucier and Baltz 1992, 1993; Holt and Holt 2003; Kupschus 2004). Spawning sites have been noted to include tidal passes, channels, river mouths, and waters in the vicinity of inlets with depths of spawning locations ranging from 2 to 10 m (Saucier and Baltz 1992, 1993; Roumillat et al. 1997; Luczkovich et al. 1999). In North Carolina, spotted seatrout in spawning condition have been collected in southern Albemarle, Pamlico, and Core/Bogue sounds, as well as in the southern estuaries (Burns 1996). Spawning in the Pamlico Sound area has been confirmed using hydrophone and sonobuoy surveys (Luczkovich et al. 1999). Luczkovich et al. (1999) detected spotted seatrout spawning on both the eastern and western sides of Pamlico Sound including Rose Bay, Jones Bay, Fisherman's Bay, Bay River, and near Ocracoke and Hatteras inlets from

May through September with peak activity in July. These spawning aggregations were primarily located in areas with depths less than 3 m. When spotted seatrout aggregations co-occurred with aggregations of weakfish at Ocracoke Inlet, the habitat was partitioned with each species occupying different depth ranges: weakfish in waters greater than 3 m and spotted seatrout in waters less than 3 m.

Additional hydrophone surveys conducted from 2003 to 2005 in the Neuse River estuary noted large spawning aggregations of spotted seatrout in this area (Barrios et al. 2006; A. Barrios, unpublished data). Although the survey was directed to locate spawning aggregations of red drum, spawning aggregations of spotted seatrout were also detected at sites ranging from Oriental to the mouth of the Neuse River (A. Barrios, unpublished data). The locations of these aggregations were generally associated with moderate salinities (12–20 ppt), temperatures between 27 and 29°C, saturated dissolved oxygen levels (>5 mg/L O₂), and water depths less than 5 m. Spawning was also reported to occur over both mud and subtidal shell bottoms in these areas. In areas south of Pamlico Sound, such as Beaufort Inlet, spotted seatrout larvae have been collected in moderate numbers indicating localized spawning (Hettler and Chester 1990). Information on spotted seatrout spawning from other areas in North Carolina is generally lacking.

1.3.3 Nursery & Juvenile Habitat

The water column provides a transport mechanism for spotted seatrout eggs and larvae. Eggs of spotted seatrout are positively buoyant at spawning salinities allowing for wind- and tidally-driven distribution throughout the estuary (Churchill et al. 1999; Holt and Holt 2003). However, sudden salinity reductions cause spotted seatrout eggs to sink, thus reducing dispersal and survival (Holt and Holt 2003). Larval spotted seatrout have been collected in surface and bottom waters of estuaries in North Carolina, Florida, and Texas (McMichael and Peters 1989; Hettler and Chester 1990; Holt and Holt 2000). In North Carolina, larval transport studies in the vicinity of Beaufort Inlet indicated that ocean- and inlet-spawned larvae are dependent on appropriate wind and tidal conditions to pass through inlets and be retained in the estuary (Churchill et al. 1999; Luetlich et al. 1999; Hare et al. 1999). Although spotted seatrout spawning generally occurs within the confines of the estuary (ASMFC 1984; Mercer 1984; Saucier and Baltz 1992, 1993), spawning aggregations have been located near inlets in North Carolina (A. Barrios, unpublished data). Therefore, these physical processes appear to directly influence the retention and recruitment success of spotted seatrout to high salinity nursery areas (McMichael and Peters 1989). Behaviors such as directional swimming and movement throughout the water column also provide mechanisms for estuarine dispersal and retention of larvae within the estuary (Rowe and Epifanio 1994; Churchill et al. 1999; Hare et al. 1999).

Wetlands are particularly valuable as nurseries and foraging habitat for spotted seatrout as well as other fishes and shellfish (Graff and Middleton 2003). The combination of shallow water, thick vegetation, and high primary productivity provides juvenile and small fishes with appropriate physicochemical conditions for growth, refuge from predation, and abundant prey resources (Boesch and Turner 1984; Mitsch and Gosselink 1993; Beck et al. 2001).

Juvenile spotted seatrout appear to use estuarine wetlands, principally salt/brackish marshes, as nurseries (Tabb 1966; ASMFC 1984; Mercer 1984). In North Carolina, juvenile spotted seatrout have been found to be abundant in tidal marshes and marsh creeks in eastern and

western Pamlico Sound and Bogue Sound (Epperly 1984; Ross and Epperly 1985; Hettler 1989; Noble and Monroe 1991). Additionally, juvenile spotted seatrout have been found using salt marsh habitats in the Cape Fear River, although in less abundance than more northern estuaries (Weinstein 1979). Documentation of juveniles in wetlands in other North Carolina estuaries is somewhat sparse. Of particular importance to juvenile spotted seatrout is the marsh edge habitat (Hettler 1989; Rakocinski et al. 1992; Baltz et al. 1993; Peterson and Turner 1994).

In Tampa Bay, McMichael and Peters (1989) found that seagrass was the primary habitat for juvenile spotted seatrout. Habitat suitability models have indicated that spotted seatrout abundance is linearly related to percent seagrass cover until a plateau is reached at 60% coverage (Kupschus 2003). The composition of species in the seagrass beds may also influence the use of these habitats by juvenile spotted seatrout (Rooker et al. 1998). Additionally, meta-analyses indicated that juvenile spotted seatrout abundances were found to be greater in SAV than soft bottom and oyster reef and were greater than or equivalent to abundances in wetland habitats (Minello 1999; Minello et al. 2003).

Soft bottom habitats also function as important nurseries for juvenile spotted seatrout (Ross and Epperly 1985; Noble and Monroe 1991). These areas generally are located adjacent to wetlands and function to provide juveniles with abundant prey resources and appropriate physicochemical conditions for growth and survival.

In North Carolina, SAV is used extensively by spotted seatrout as important nurseries and foraging grounds. Historical data collected by the NCDMF through otter trawl and seine surveys have indicated that juveniles are abundant in high salinity SAV in both Pamlico and Core sounds (Purvis 1976; Wolff 1976; NCDMF 1990).

1.3.4 Adult Habitat

Collections with long haul seines in eastern Pamlico Sound have documented an abundance of adult spotted seatrout in SAV from Oregon Inlet to Ocracoke Inlet (NCDMF 1990). Furthermore, the NCDMF Fisheries-Independent Gill-Net Survey (Program 915), Red Drum Juvenile Survey (Program 123), and Estuarine Trawl Survey (Program 120) have found that relative abundance of spotted seatrout was generally greatest over high salinity SAV in eastern Pamlico Sound (NCDMF, unpublished data).

The complex three-dimensional structure of shell bottom habitats provides juvenile and adult spotted seatrout with areas for refuge, foraging, and growth. Juvenile and adult spotted seatrout have been documented using shell bottom habitats in Virginia (Harding and Mann 2001), North Carolina (Lenihan et al. 2001; Grabowski 2002), South Carolina (Daniel 1988), and Louisiana (MacRae 2006).

1.3.5 Habitat Issues & Concerns

Although this species is euryhaline, salinity plays an important role in the buoyancy of eggs and larvae, which are negatively buoyant at salinities less than 20 ppt (Holt and Holt 2003). Documented spawning activity of spotted seatrout in western Pamlico Sound tributaries, such as Bay River, Jones Bay, and Neuse River, frequently experience salinities less than 20 ppt (Luczkovich et al. 1999; A Barrios, unpublished data), which could result in the failed survival of eggs spawned in these areas. Dissolved oxygen concentrations also affect spotted seatrout distribution, with decreasing abundance at concentrations less than saturation

(Gelwick et al. 2001). Human activities that alter the preferred environmental conditions of spotted seatrout, as well as introductions of excessive nutrients, toxins, and sediment loads, can severely impact the habitat value for spotted seatrout.

Most demersal fishes experience low-oxygen induced mortality in waters having 1–2 mg/L O₂ and altered metabolism at concentrations less than 4 mg/L O₂ (Miller et al. 1985; Gray et al. 2002). Some estuarine organisms are capable of detecting and avoiding these low dissolved oxygen concentrations, but thresholds vary among species (Wannamaker and Rice 2000). There are no reported oxygen thresholds for spotted seatrout; however, this species is often reported to be associated with habitats with saturated dissolved oxygen concentrations (Gelwick et al. 2001).

Increased sedimentation in water column habitats can have significant impacts on aquatic life. Increased turbidity can shade out productive flora such as phytoplankton and SAV (North Carolina Sea Grant 1997), resulting in trophic impacts for secondary and tertiary consumers. In addition, the increased sediment load in the water column can clog gills and pores of fish and invertebrates, resulting in reduced feeding capacities or even mortality (Ross and Lancaster 1996; NCDWQ 2000a). Tabb et al. (1962) reported that excessively turbid waters in Everglades National Park following Hurricane Donna resulted in mass mortalities of spotted seatrout when their gill chambers became packed with suspended sediments.

Winter water temperature dynamics are of particular importance to habitat quality for spotted seatrout. Generally, spotted seatrout overwinter in estuaries, only moving to deeper channels or to nearshore ocean habitats in response to water temperatures below 10°C (Tabb 1966; ASMFC 1984). However, extreme cold waves accompanied by strong winds mix and chill the water column, causing sudden drops in water temperature. The abrupt temperature decline numbs spotted seatrout and can result in mass mortality (Tabb 1966). Many estuarine temperature refuges, such as deep holes and channels, are often far from inlets and become death traps as spotted seatrout are cold stunned before they can escape. This suggests that the severity and duration of cold weather events can have profound effects on the spotted seatrout population in North Carolina's estuaries.

1.4 Description of Fisheries

1.4.1 Commercial Fishery

Spotted seatrout have been commercially harvested in North Carolina using a variety of gears, but four gear types are most common: estuarine gill net, long haul seine, beach seine, and ocean gill net. Estuarine gill nets are the predominant gear. Historically, long haul seines (swipe nets) used in estuarine (inshore) waters were the dominant gear, but effort and landings by this gear have diminished in recent years.

Monthly landings of spotted seatrout by estuarine set gill nets occur year round but mostly occur during the late fall and winter (October–February), with slight increases in the spring (April–May).

The importance of runaround gill nets in North Carolina has steadily increased since 1972 and a continued surge in the mid 1990s may have been caused by the 1995 gill-net closure in Florida state waters (NCDMF 2006) as some of Florida's commercial fishermen moved their operations to North Carolina. More jet drive boats, spotting towers, night fishing, and

runaround gill netting were reported by the mid-1990s. A shift from set nets to runaround fishing techniques may have been prompted by expanded fishery rules requiring gill-net attendance for small mesh (<5 inches stretch mesh) beginning in 1998.

Monthly landings of spotted seatrout by estuarine runaround gill nets are highest in November and December. A large spike in the number of positive trips occurs during October without a corresponding spike in catch. This could be indicative of spotted seatrout bycatch in other fisheries that are active during October such as the striped mullet fishery.

The long haul season starts in the spring and continues through the fall. The majority of trips occur in July; however, the best catches occur in November and December.

The small mesh beach seine fishery operates predominantly during the spring (April-May) and fall (September-October). Beach seine landings of spotted seatrout typically occur during the spring (April-May) and fall (October-November) months. If conditions are favorable, fishermen along the northern Outer Banks particularly target spotted seatrout during the full moon in May.

Landings of spotted seatrout by ocean set nets are most active from October through February, but good catches occur in April and May.

1.4.2 Recreational Fishery

Spotted seatrout are taken by a variety of methods throughout the coastal zone. Depending on the time of year, anglers fish for spotted seatrout from the surf, inlets, piers and jetties, bays and rivers, and inland creeks. The fall season produces the largest portion of the catch and offers the most widespread fishing opportunities. Anglers catch spotted seatrout using an array of artificial and natural baits. Preferred artificial baits include soft and hard bodied lures of various colors and shapes fished on the bottom, mid-water, and top water. Bottom fishing using natural baits (including live shrimp, mullet, and mud minnows) is also very popular and can be very productive as well.

While lures and fishing techniques are constantly evolving, the past few years have seen significant changes and improvements in lures and other tackle available to anglers that target and catch spotted seatrout. There is anecdotal evidence that these improvements have had a positive impact on catch rate and overall fishing success. In the early 2000s, bait manufacturers introduced “scented” soft-bodied lures that have become very popular and lead to increased success of anglers targeting spotted seatrout. “GULP” fishing baits have become a basic component of every spotted seatrout angler’s tackle box. Hard-bodied artificial baits such as those from MirrOlure®, Yo-Zuri, and Rapala have also undergone design and color pattern changes increasing their effectiveness. Spotted seatrout are often selective requiring anglers to utilize a variety of baits and different fishing techniques. Many anglers also attest to better catch rates due to the widespread use of braided fishing lines. Braided lines along with new graphite rod building technology provide increased sensitivity improving strike detections resulting in more fish caught.

In addition to hook and line catches, some spotted seatrout are taken by gig and recreational commercial gear (gill nets) where permitted (ASMFC 1984; Watterson 2003).

1.5 Fisheries Management

1.5.1 Management Authority

The NCDMF is responsible for the management of estuarine and marine resources occurring in all state coastal fishing waters extending to three miles offshore. The VMRC is responsible for tidal waters of Virginia and the ocean waters extending to three miles offshore.

Spotted seatrout have been managed along the Atlantic Coast through an Interjurisdictional FMP developed by the Atlantic States Marine Fisheries Commission (ASMFC). The ASMFC Spotted Seatrout FMP was initially approved in 1984 (ASMFC 1984), and has been reviewed annually since 2001. Amendment 1, approved by the ASMFC Policy Board in November 1990, developed a list of goals for coast-wide management but allowed each state that had an interest in the spotted seatrout fishery (Florida through Maryland) to manage their stocks independently (ASMFC 1990). The adoption of the Omnibus Amendment 2 (ASMFC 2011) to the Interstate Fishery Management Plan for spotted seatrout requires states to comply with Atlantic Coastal Fisheries Cooperative Management Act (1993) and the ASMFC Interstate Fishery Management Program Charter. North Carolina currently is in compliance with the minimum size limit for both recreational and commercial sectors and has adopted the recommended 20% spawning potential ratio (SPR) threshold.

1.5.2 Management Unit Definition

The management unit includes spotted seatrout and its fisheries in all of Virginia and North Carolina's fishing waters.

1.5.3 Regulatory History

VMRC

On July 1, 1992, the VMRC established a 14-inch minimum size limit for both the commercial and recreational fisheries, as well as a 10-fish possession limit for the recreational fishery, as well as commercial hook and line. On August 1, 1995, a commercial quota of 51,104 pounds was established with a season running from September 1 through August 31 of the following year. Beginning April 1, 2011, the VMRC lowered the commercial hook and line and the recreational possession limit to 5 fish from December 1 through March 31, with only 1 fish 24 inches or greater. As of April 1, 2014, the VMRC established the 5 fish commercial hook and line and recreational possession limit, with only 1 fish 24 inches or greater as a year round regulation. Also effective April 1, 2014 a trigger was established that once 80% of the commercial quota was harvested the commercial possession limit will be no greater than 100 pounds of spotted seatrout with an equal amount of other species on board.

Regulatory history since 1992 is listed in Tables 1.8 and 1.9.

NCDMF

The size limit rule for spotted seatrout was effective September 1989 (12 inches). The first harvest restriction (10-fish recreational bag limit or taken by hook and line) was established through proclamation authority of hook-and-line regulated species (1994). This was put into rule in 1997. The rules remained the same until 2009 when the size limit was increased by proclamation (14 inches).

Rules for spotted seatrout management from 1991 to 2009 were:

- (a) It is unlawful to possess spotted seatrout less than 12 inches total length.
- (b) It is unlawful to possess more than 10 spotted seatrout per person per day taken by hook-and-line or for recreational purposes.

Since 2009, there have been several changes to the management of spotted seatrout.

Proclamation history since 2009 is listed in Tables 1.10 and 1.11.

1.5.4 Current Regulations

VMRC

In Virginia, A 14-inch minimum size limit exists for both the commercial and recreational fisheries. If caught by pound net or haul seine, up to 5.0% (by weight) of the fish can be undersized. A commercial quota of 51,104 pounds was established with a season running from September 1 through August 31 of the following year. Once 80% of the commercial quota is harvested, the commercial possession limit will be no greater than 100 pounds of spotted seatrout with an equal amount of other species on board. The VMRC will close the fishery based on weekly dealer reporting when it is projected that the quota has been attained. The commercial hook and line and the recreational possession limit is five fish, with only one fish 24 inches or greater.

NCDMF

The NCDMF currently allows the recreational harvest of spotted seatrout seven days per week with a minimum size limit of 14 inches total length and a daily bag limit of four fish. The commercial harvest is limited to a daily limit of 75 fish with a minimum size limit of 14 inches total length. It is unlawful for a commercial fishing operation to possess or sell spotted seatrout for commercial purposes taken from Joint Fishing Waters of the state from midnight on Friday to midnight on Sunday each week, the Albemarle and Currituck sounds are exempt from this weekend closure.

1.6 Assessment History

1.6.1 Review of Previous Methods & Results

The 2009 NCDMF spotted seatrout assessment applied a forward-projecting age-structured model (ASAP version 2.0.17) to data collected from 1991 to 2008 (Jensen 2009). The inputs included commercial landings at age, recreational catch at age, and three indices of abundance. An index based on the NCDMF Fishery-Independent Gill-Net Survey (Program 915) in Pamlico Sound served as the only fisheries-independent index. Data from the North Carolina Trip Ticket Program were used to develop a fisheries-dependent index for 1994 to 2008. Another fisheries-dependent index was developed based on data collected in the MRFSS program. Based on the results of the stock assessment, the stock was overfished and overfishing was occurring at the time of the last assessment (Jensen 2009; NCDMF 2012b).

1.6.2 Progress on Research Recommendations

The following research recommendations were listed in the 2009 NCDMF assessment of spotted seatrout (Jensen 2009). Progress on individual recommendations is also noted if information was available.

1. This assessment is based on the assumption that spotted seatrout in both Virginia and North Carolina waters can be treated as a unit stock. Microchemistry, genetic, or tagging

studies are needed to verify migration patterns, mixing rates, or origins of spotted seatrout between North Carolina and Virginia. In addition, tagging studies can also be designed to verify estimates of natural and fishing mortality used in this assessment. Given the nature of seatrout to remain in their natal estuary, it is also possible that there are localized populations within the state of North Carolina (e.g., a southern and northern stock) that could confound the assessment results.

Progress: Ellis (2013) conducted a tag-return study to estimate fishing and natural mortality of spotted seatrout in North Carolina waters during 2010–2013. The spatial distribution of tag recoveries was also used to infer movement patterns of the adult stock. Most recoveries occurred near the location of tagging, indicating year-round residence in estuarine waters and little long distance movement; however, fish tagged in the northern Outer Banks were more frequently recovered at great distances from the tagging location, indicating less closure of the population in this area. Most interstate movement (9.8% of all recoveries) was in a northwards direction and/or in Chesapeake Bay. Fall movements tended to be southwards, and spring and summer movements tended to be northwards. While Ellis (2013) reported the fraction of extra-jurisdictional recoveries, movement rates could not be quantified within the tag-return model because fish were not tagged in all areas (Virginia and South Carolina).

2. Development of a juvenile abundance index would enhance the ASAP's ability to model recruitment.

Progress: An index of juvenile spotted seatrout abundance was developed from the NCDMF Estuarine Trawl Survey (Program 120) data for use in the current assessment (see section 2.2.1).

3. Batch fecundity estimates are needed for spotted seatrout in North Carolina. Estimates of batch fecundity are variable from spotted seatrout populations in other states (Bortone 2003) and were therefore not used in this assessment. Estimates of batch fecundity from North Carolina could result in a clearer stock recruitment relationship, and may provide better estimates of spawning potential ratios.

Progress: No further research into spotted seatrout batch fecundity has been conducted since the time of the last stock assessment. The current assessment uses spawning stock biomass as a proxy for egg production.

4. A longer time series and additional sources of fishery-independent information would enhance the accuracy of the model. The current model relies heavily upon fishery-dependent information.

Progress: The current assessment model incorporates five fisheries-independent survey indices. Additionally, four years of data have been added to the model.

5. There was some question about the precision of the MRFSS index used in this assessment, particularly since the trend of the index did not follow those of the rest of the data inputs. Application of the Stephens and MacCall (2004) method, used to develop the commercial trip ticket index, to the MRFSS data may result in a more reliable index.

Progress: Indices of relative spotted seatrout abundance were not developed from fisheries-dependent data because fisheries-dependent indices are associated with numerous biases. Relative indices are assumed to be proportional to stock size. In order

for a fisheries-dependent index to be proportional to abundance, fishing effort must be random with respect to the distribution of the population and catchability must be constant over space and time. This is one of the benefits of fisheries-independent surveys for use as indices of abundance—they are designed to provide unbiased estimators and employ a standard methodology over time and space. Other factors affecting the proportionality of fisheries-dependent indices to stock size include changes in fishing power, gear selectivity, gear saturation and handling time, fishery regulations, gear configuration, fishermen skill, market prices, discarding, vulnerability and availability to the gear, distribution of fishing activity, seasonal and spatial patterns of stock distribution, changes in stock abundance, and environmental variables. Additionally, it is often difficult to define a standard unit of effort for fisheries-dependent data. Many agencies, including the NCDMF, don't require fishermen to report records of positive effort with zero catch; lack of these "zero catch" records in the calculation of indices can introduce further bias. Furthermore, fisheries-dependent indices are, at most, only reflective of trends in fished areas and apply only to individuals within the size range that is capable of being caught by the fishing gear. Both fisheries-dependent and fisheries-independent indices can be standardized to account for factors other than changes in abundance that affect the indices (Maunder and Punt 2004). This requires the collection of auxiliary data at the time of harvest or sampling event. Often, such data are not available for fisheries-dependent indices. Finally, fisheries-dependent indices tend to exhibit hyperstability (Harley 2001); that is, the index remains high while the population declines.

6. Increased observer coverage in a variety of commercial fisheries over a wider area would help to confirm whether discards of spotted seatrout in the commercial fishery are indeed negligible.

Progress: Observer coverage in the gill-net fishery has increased following litigation under the U.S. Endangered Species Act to protect sea turtles from illegal takes within North Carolina waters.

7. If spotted seatrout from Virginia continue to be included in future spotted seatrout stock assessments for North Carolina, it would be beneficial to compare maturity ogives from both states. Currently, Virginia's maturity data are not collected in a way that allows for development of these ogives.

Progress: No progress has been made in comparing Virginia and North Carolina maturity schedules, because Virginia data is not suitable for the development of a maturity ogive. The VMRC collects maturity data from fisheries-dependent sources only, which would result in a biased estimate of maturity parameters because only larger, presumably more mature, fish would be included. Additionally, their data are not collected in a way that allows for development of maturity ogives.

8. Further research on the possible influences of salinity on release mortality of spotted seatrout would confirm the strategy of applying different release mortalities to fish caught in areas of differing salinity.

Progress: No further research into spotted seatrout catch-and-release or discard mortality has been conducted since the time of the last stock assessment.

9. Investigation of the relationship of temperature with both adult and juvenile mortality could contribute more information to the model. The feasibility of including measures of temperature or salinity into the stock-recruitment relationship could be researched; although, these comparisons should be attempted with caution to avoid spurious correlations between environmental variables and resulting recruitment.

Progress: Ellis (2013) conducted a large-scale tag-return study to estimate adult fishing and natural mortality in North Carolina waters. The results demonstrated that spotted seatrout in North Carolina experience relatively low levels of fishing mortality and episodically high natural mortality during “cold stun” years. A “cold stun” event appeared to occur when water temperatures dropped below 5°C during the winter of 2010/2011, when bimonthly natural mortality was estimated to be as high as 2.6. In contrast, the highest level of bimonthly fishing mortality was estimated to be 0.14. Separate experiments, telemetry and laboratory, confirmed the approximate temperature threshold identified in the tag-return study. Estimates of total mortality were corroborated by fitting a catch curve to Program 915 spotted seatrout data during the same time periods as the tag-return study.

2 DATA

Note that all data were summarized by fishing year (March to February) to correspond with the life history of the species (a March 1 birth date was assumed). Data were summarized for fishing years 1991 (March 1991) to 2012 (February 2013), where available, to coincide with the time series used in the stock assessment model. The year 1991 was the first year in which age data were available.

2.1 Fisheries-Dependent

2.1.1 Commercial Landings

2.1.1.1 Survey Design and Methods

VMRC

The VMRC’s commercial fisheries records include information on both commercial harvest (fish caught and kept from an area) and landings (fish offloaded at a dock) in Virginia. Records of fish harvested from federal waters and landed in Virginia have been provided by the NMFS and its predecessors since 1929 (NMFS, pers. comm.). The VMRC began collecting voluntary reports of commercial landings from seafood buyers in 1973. A mandatory harvester reporting system was initiated in 1993 and collects trip-level data on harvest and landings within Virginia waters. Data collected from the mandatory reporting program are considered reliable starting in 1994, the year after the pilot year of program. The Potomac River Fisheries Commission has provided information on fish caught in their jurisdiction and landed in Virginia since 1973.

NCDMF

Prior to 1978, North Carolina’s commercial landings data were collected by the National Marine Fisheries Service (NMFS). In 1978, the NCDMF entered into a cooperative program with the NMFS to maintain and expand the monthly surveys of North Carolina’s major commercial seafood dealers. Beginning in 1994, the NCDMF instituted a mandatory trip-ticket system to track commercial landings.

On January 1, 1994, the NCDMF initiated a Trip Ticket Program (TTP) to obtain more complete and accurate trip-level commercial landings statistics (Lupton and Phalen 1996). Trip ticket forms are used by state-licensed fish dealers to document all transfers of fish sold from coastal waters from the fishermen to the dealer. The data reported on these forms include transaction date, area fished, gear used, and landed species as well as fishermen and dealer information.

The majority of trips reported to the NCDMF TTP only record one gear per trip; however, as many as three gears can be reported on a trip ticket and are entered by the program's data clerks in no particular order. When multiple gears are listed on a trip ticket, the first gear may not be the gear used to catch a specific species if multiple species were listed on the same ticket but caught with different gears. In 2004, electronic reporting of trip tickets became available to commercial dealers and made it possible to associate a specific gear for each species reported. This increased the accuracy of reporting by documenting the correct relationship between gear and species.

2.1.1.2 Sampling Intensity

VMRC

All registered licensees are required to report daily harvest from Virginia tidal and federal waters to the VMRC on a monthly basis.

NCDMF

North Carolina dealers are required to record each transaction with a fisherman and report trip-level data to the NCDMF on a monthly basis.

2.1.1.3 Biological Sampling

VMRC

Field sampling at fish processing houses or dealers involves multi-stage random sampling. Targets are set based on mandatory reporting of harvest data by harvesters from the previous years. A three-year moving average of landings by gear and by month (or other temporal segment) provides a preliminary goal for the amount of length and weight samples to be collected. Real time landings are used to adjust the preliminary targets. Targets for ageing samples (see below for criteria) are tracked and collection updates are done weekly. Sampling data are recorded on electronic measuring boards. Weights of individual fish are recorded on electronic scales and downloaded directly to the electronic boards. A fish identification number unique to each specimen is created as well as a batch number for a subsample from a specific trip.

Subsamples of a catch or batch are processed for sex information (gender and gonadal maturity or spawning condition index). Such subsamples are indexed by visual inspection (macroscopic) of the gonads. Females are indexed as gonadal stage I–V and males I–IV, with stage I representing an immature or resting stage of gonadal development and stages IV (males) and V (females) representing spent fish. Fish that cannot be accurately categorized in terms of spawning condition are not assigned a gonadal maturity stage.

The goal of otolith collection is to correspond to the frequency distribution in lengths from past seasons, according to 1-inch length bins. The age sampling is designed to achieve a coefficient of variation equal to 0.2 (Quinn and Deriso 1999) at each length interval. Fish are then randomly selected from each length interval (bin) to process. It is important to note that

samples collected for ageing do not fall into a random sampling regime and are treated accordingly (i.e., are not included in analyses dependent on random sampling).

Ancillary data for fish sampled at dealers are collected and include date harvested, harvest area, gear type used, and total catch (recorded if only a subsample was measured). This information would allow for expansion of the sample size to the total harvest reported for a species. Estimates of effort are not typically recorded by this program but can be extrapolated from mandatory harvest reports sent to the VMRC on a monthly basis by harvesters, sometime after a sampling event.

The Virginia Recreational Assessment Program, funded by the Virginia Saltwater Development Fund, began in late June 2007. Chest freezers are located throughout the Tidewater area of Virginia. Anglers can leave whole or filleted fish in the freezers. They fill out a form giving the date and general location when and where the fish was caught and the weight if known (all of the sites are Virginia Saltwater Fishing Tournament Sites with certified scales). Anglers who complete the form receive a t-shirt or hat as a reward for donating the fish. It should be noted that although some weights are recorded by anglers at the time of donation, the majority of samples to the Recreational Assessment Program do not include weights, and the fish were already filleted when processed by VMRC technicians. As such, although these data are exceptionally valuable for length-at-age analysis, no average weight data are provided from the recreational fisheries.

The numbers of spotted seatrout lengths and ages sampled from commercial landings by the VMRC are summarized in Table 2.1.

NCDMF

Commercial length-frequency data were obtained by the NCDMF commercial fisheries-dependent sampling program. Spotted seatrout lengths are collected at local fish houses by gear, market grade, and area fished. Random samples of culled catches are taken to ensure adequate coverage of all species in the catches. Length frequencies obtained from a sample were expanded to the total catch using the total weights from the trip ticket. All expanded catches were then combined to describe a given commercial gear for a specified time period.

In cases where the weight of particular species' market grades were included on the trip ticket but were not sampled, an estimate of the number of fish landed for the grade was made by using the mean weight per individual from samples of that species and grade from the same year. Species numerical abundance was calculated by determining the number of individuals/market grade and then summing all the market grades for each species. Catches were analyzed by gear type, year and semi-annually by "fishing season" (i.e., March–August and September–February).

The NCDMF collects spotted seatrout age samples monthly beginning January 1st of each year and continuing through the end of December. A target of 10 age samples per 50-mm size bin is set for each month. Samples are collected through both fishery-independent and fishery-dependent sampling. If fish are not able to be sampled at a fish house, funds have been intermittently available to purchase fish from seafood dealers for later processing. Once all age structures are processed they are transferred to the ageing lab in Morehead City where they are sectioned and mounted on slides. The ageing lab biologist and technicians complete the first read of each otolith and records the age. The otoliths are then transferred to the species lead for a second read. This second read is done independently of the first with no

knowledge of the first read. The only information provided to the reader is the date of collection to minimize bias. Annuli formation for spotted seatrout is between April and June. Each annuli is counted to determine the appropriate age (year class); if the sample was collected prior to April and there is no evidence of annuli formation on the edge, the edge is counted as an additional age; if the sample is after April and there is evidence of new annuli formation on the edge, the edge is counted as plus growth, not as an additional age. The species lead then transfers the second reads to the age lab where the ages are compared. If there is a discrepancy in ages, the two readers discuss the section and either agree to an age or remove the sample from the analysis. Once the ages are finalized the ageing lab transfers the ages to the Biological Database Analyst for upload to the state mainframe.

The numbers of spotted seatrout lengths and ages sampled from commercial landings by the NCDMF are summarized in Table 2.2.

2.1.1.4 Potential Biases & Uncertainty

Because trip tickets are only submitted when fish are transferred from fishermen to dealers, records of unsuccessful fishing trips are not available for both the VMRC and the NCDMF. As such, there is no direct information regarding trips where a species was targeted but not caught. Information on these unsuccessful trips is necessary for calculating a reliable index of relative abundance for use in stock assessments.

Another potential bias for NCDMF data relates to the reporting of multiple gears on a single trip ticket. It is not always possible to identify the gear used to catch a particular species on a trip ticket that lists multiple gears and species.

2.1.1.5 Development of Estimates

Commercial landings were categorized into estuarine and ocean areas based on gear types. Annual commercial landings statistics were calculated by year and area (estuarine and ocean) for both states combined and separately by state.

Length data were summarized by 2-cm length bins and year. Age data were summarized by year and sex. Both length and age data were pooled over states and summarized for the commercial estuarine and commercial ocean fisheries separately.

2.1.1.6 Estimates of Commercial Landings Statistics

Total commercial landings for Virginia and North Carolina combined have ranged from 44.9 to 345 mt between 1991 and 2012 (Figure 2.1). During the early to mid-1990s, landings in the ocean and estuarine areas were more similar than in the remainder of the time series in which estuarine landings have dominated. Commercial landings of spotted seatrout have been consistently higher for North Carolina than Virginia for both the estuarine and ocean areas (Table 2.3).

Commercial length-frequency data are summarized in Figures 2.2–2.5. Commercial estuarine landings have been dominated by age-1 and age-2 spotted seatrout (Figures 2.6 and 2.7). The commercial ocean fishery is predominantly comprised of age-1 fish (Figures 2.8 and 2.9).

2.1.2 Commercial Discards

2.1.2.1 Survey Design and Methods

The Sea Turtle Bycatch Monitoring Program (Program 466) was designed to monitor bycatch in the gill-net fishery, providing onboard observations to characterize effort, catch, and

finfish bycatch by area and season. Additionally, this program monitors fisheries for protected species interactions. The onboard observer program requires the observer to ride onboard the commercial fishermen's vessel and record detailed gill-net catch and discard information for all species encountered. Observers contact licensed commercial gill-net fishermen throughout the state in order to coordinate observed fishing trips. Observers may also observe fishing trips from NCDMF vessels under Program 467 (alternate platform observations), but these data were not used in this stock assessment.

2.1.2.2 Sampling Intensity

Fishing trips are observed throughout the year; however, most observed trips occur during the fall when landings were the greatest in areas with a history of sea turtle interactions.

2.1.2.3 Biological Sampling

Data collected from each species include length, weight, and fate (landed, live discard, dead discard).

2.1.2.4 Potential Biases & Uncertainty

Program 466 began sampling statewide in May 2010. To provide optimal coverage throughout the state, management units were created to maintain proper coverage of the fisheries. Management units were delineated on the basis of four primary factors: similarity of fisheries and management; extent of known protected species interactions in commercial gill net fisheries; unit size; and the ability of the NCDMF to monitor fishing effort. Total effort for each management unit can vary annually based on fishery closures due to protected species interactions or other regulatory actions. Therefore, the number of trips and effort sampled each year by management unit varies both spatially and temporally.

Program 466 data do not span the entire time series for the assessment (no data are available for 1991–2000 and spatially limited data are available 2000–2003). Since 2004, observed trips were sparse for some seasons and management areas for several years despite widespread fishing effort. However, observations were likely adequate to determine whether discards in this fishery were a significant source of removals from the population. Observer data have been collected throughout the Pamlico Sound since 2000 and outside the Pamlico Sound since 2004. Data from 2000 to 2003 were not included due to spatial limitations.

2.1.2.5 Development of Estimates

A generalized linear model (GLM) framework was used to predict spotted seatrout discards in North Carolina's estuarine gill-net fishery based on data collected during 2004 through 2012. Only those variables available in all data sources were considered as potential covariates in the model. Available variables were year, season, and mesh category (large: ≥ 5 inches and small: < 5 inches), all of which were treated as categorical variables in the model. Effort was measured as soak time (days) multiplied by net length (yards). Live and dead discards were modeled together as total discards; attempts at modeling live and dead discards separately resulted in convergence issues.

All available covariates were included in the initial model and assessed for significance using the appropriate statistical test. Non-significant covariates were removed using backwards selection to find the best-fitting predictive model. The offset term was included in the model to account for differences in fishing effort among observations (Crawley 2007; Zuur et al. 2009, 2012). Using effort as an offset term in the model assumes the number of spotted

seatrout discards is proportional to fishing effort (A. Zuur, Highland Statistics Ltd., personal communication).

A score test confirmed the discard data were significantly zero-inflated, so zero-inflated models appropriate for count data were considered. There are two types of models commonly used for count data that contain excess zeros. Those models are zero-altered (two-part or hurdle models) and zero-inflated (mixture) models (see Minami et al. 2007 and Zuur et al. 2009 for detailed information regarding the differences of these models). Minami et al. (2007) suggests that zero-inflated models may be more appropriate for catches of rarely encountered species; therefore, zero-inflated models were initially considered.

Estimates of the total number of discards were generated using the zero-inflated GLM. The observed ratio of live to dead discards was computed from the raw data and applied to the GLM estimates to calculate the number of dead discards. A discard mortality rate of 60% (see section 1.2.6) was applied to the estimates of live discards to estimate those live discards that were not expected to survive. This number was added to the number of dead discards to estimate the total number of dead discards.

Length data were summarized by 2-cm length bins and year.

2.1.2.6 Estimates of Commercial Discard Statistics

Estimates of dead commercial discards for North Carolina were variable for the gill-net estuarine fishery during 2004 through 2012 (Figure 2.10). Estimates were minimal compared to the magnitude of all fisheries overall. Though estimates of discards from Virginia were not available, they were assumed minimal as well.

Annual length-frequency distributions of commercial gill-net estuarine fishery discards are shown in Figure 2.11.

2.1.3 Recreational Fishery Monitoring

Information on commercial fisheries has long been collected by the National Marine Fisheries Service (NMFS). However, data on marine recreational fisheries were not collected in a systematic manner by NMFS on a continuing basis until 1979. The purpose of the NMFS Marine Recreational Information Program (MRIP) is to establish a reliable database for estimating the impact of marine recreational fishing on marine resources. A detailed overview of the program can be found online at <http://www.st.nmfs.noaa.gov/recreational-fisheries/index>.

2.1.3.1 Survey Design and Methods

Data collection consists primarily of two complementary surveys: a telephone household survey and an angler-intercept survey. In 2005, the MRIP began at-sea sampling of headboat (party boat) fishing trips. Data derived from the telephone survey are used to estimate the number of recreational fishing trips (effort) for each stratum. The intercept and at-sea headboat data are used to estimate catch-per-trip for each species encountered. The estimated number of angler trips is multiplied by the estimated average catch-per-trip to calculate an estimate of total catch for each survey stratum.

The MRIP estimates are divided into three catch types depending on availability for sampling. The MRIP classifies those fish brought to the dock in whole form, which are identified and measured by trained interviewers, as landings (Type A). Fish that are not in

whole form (bait, filleted, released dead) when brought to the dock are classified as discards (Type B1), which are reported to the interviewer, but identified by the angler. Fish that are released dead during at-sea headboat sampling, which began in 2005, are also classified as Type B1 discards. The sum of Types A and B1 provides an estimate of total harvest for the recreational fishery. Anglers also report fish that are released live (Type B2) to the interviewer. Those fish that are released alive during the at-sea headboat survey are also considered Type B2 catch. Total recreational catch is considered the sum of the three catch types (A+B1+B2). The numbers of spotted seatrout sampled in Virginia and North Carolina are presented in Table 2.4.

2.1.3.2 Sampling Intensity

Creel clerks collect intercept data year round (in two-month waves) by interviewing anglers completing fishing trips in one of four fishing modes (man-made structures, beaches, private boats, and for-hire vessels). Results from both component surveys are combined at the state, area, fishing mode, and wave level to provide estimates of the total number of fish caught, released, and harvested; the weight of the harvest; the total number of trips; and total participation in marine recreational fishing. All estimates generated through MRIP include the proportional standard error (PSE), which is a measure of the precision of the estimates. The PSE is calculated by dividing the standard error of the estimate by the estimate to express the standard error as a percentage.

2.1.3.3 Biological Sampling

The MRIP interviewers routinely sample fish of Type A catch that are encountered during the angler-intercept survey. Fish discarded during the at-sea headboat survey are also sampled—the headboat survey is the only source of biological data characterizing discarded catch that are collected by the MRIP. The sampled fish are weighed to the nearest five one-hundredth (0.05) of a kilogram or the nearest tenth (0.10) of a kilogram (depending on scale used) and measured to the nearest millimeter for the length type appropriate to the morphology of the fish. The numbers of spotted seatrout measured in Virginia and North Carolina by the MRIP are summarized in Table 2.4.

The VMRC collects ages from its recreational fisheries through the Virginia Recreational Assessment Program (see section 2.1.1.3). All age structures are sent to Old Dominion University for processing. The numbers of spotted seatrout age samples collected by the VMRC are summarized in Table 2.5.

2.1.3.4 Potential Biases & Uncertainty

The MRIP estimates are based on a stratified random sampling design and so are designed to be unbiased. There have been a few instances when the random telephone survey was found to be unrepresentative and an average estimate of trips was substituted. Most recently, the 2002 telephone survey data were discarded for waves 2 and 3 and effort estimates were instead based on a three-year average (1999–2001) for those waves. The MRIP advises that the weight estimates are minimum values and so may not accurately reflect the actual total weight of fish harvested.

Recent concerns regarding the timeliness and accuracy of the MRFSS (precursor to MRIP) program prompted the NMFS to request a thorough review of the methods used to collect and analyze marine recreational fisheries data. The National Research Council (NRC) convened a committee to perform the review, which was completed in 2006 (NRC 2006).

The review resulted in a number of recommendations for improving the effectiveness and utility of sampling and estimation methods. In response to the recommendations, the NMFS initiated the current program, MRIP—a program designed to improve the quality and accuracy of marine recreational fisheries data. The objective of the MRIP program is to provide timely and accurate estimates of marine recreational fisheries catch and effort and provide reliable data to support stock assessment and fisheries management decisions. The program will be reviewed periodically and undergo modifications as needed to address changing management needs.

2.1.3.5 Development of Estimates

The methods for estimating recreational catch were modified in 2011 to eliminate bias while improving precision. The new MRIP method for producing estimates has been in place since 2012, replacing the previous MRFSS method. Taking advantage of the new methodology, NOAA analysts produced new estimates of catch from 2004 through 2011. In March 2012, a MRFSS/MRIP calibration workshop was held and the panel recommended that stock assessments use estimates calculated using the MRIP methodology. A follow-up workshop further recommended that estimates for years prior to 2004—years for which the data do not allow application of the MRIP methodology—should be calibrated to the MRIP estimates using a ratio of means estimator (Salz et al. 2012). The ratio of means estimator was applied to recreational fishery statistics prior to 2004. A discard mortality rate of 10% (see section 1.2.6) was applied to the numbers of spotted seatrout released alive to estimate numbers of dead discards for the recreational fishery. Recreational fishery statistics were calculated by year for both states combined and separately by state.

Length data were pooled across states and summarized by 2-cm length bins and year. Age data collected from Virginia's recreational fishery were summarized by year and sex for the years in which data were available.

2.1.3.6 Estimates of Recreational Fishery Statistics

Recreational harvest (Type A + B1) in terms of weight ranged from 112 to 593 mt between 1991 and 2012 (Figure 2.12). In terms of numbers, recreational harvest (Type A + B1) has ranged from 208,109 to 727,714 fish during the same time period (Figure 2.13). Estimates of live releases (Type B2) usually exceeded harvest (Type A + B1), especially in recent years. Like live releases (Type B2), estimates of dead discards (dead B2) have shown a general increase from 1991 through 2012 (Figure 2.14). Recreational catch statistics have been generally smaller for Virginia (Table 2.6) as compared to North Carolina (Table 2.7), though estimates of recreational harvest (Type A + B1) are associated with higher uncertainty (generally higher proportional standard error—PSE—values).

Annual length-frequency data for the recreational fishery are presented in Figures 2.15 and 2.16. Plots of age data for the recreational fishery indicate ages 0 through 6+ have occurred in the fishery (Figure 2.17).

2.2 Fisheries-Independent

All the available fisheries-independent data come from North Carolina as there are currently no fisheries-independent sampling programs in Virginia that catch sufficient numbers of spotted seatrout to develop a reliable index.

2.2.1 Estuarine Trawl Survey (Program 120)

2.2.1.1 Survey Design and Methods

In 1971, the NCDMF initiated a statewide Estuarine Trawl Survey, also known as Program 120 (P120). The initial objectives of the survey were to identify the primary nursery areas and produce annual recruitment indices for economically important species. Other objectives included monitoring species distribution by season and by area and providing data for evaluation of environmental impact projects.

The survey samples shallow-water areas south of the Albemarle Sound system including Pamlico Sound, Pamlico River, Neuse River, New River, and Cape Fear River (Figure 2.18). Major gear changes and standardization in sampling occurred in 1978 and 1989. In 1978, tow times were set at one minute during the daylight hours. In 1989, an analysis was conducted to determine a more efficient sampling time frame for developing juvenile abundance indices with acceptable precision levels for the target species. A fixed set of 105 core stations was identified and sampling was to be conducted in May and June only, except for July sampling for weakfish (dropped in 1998, Program 195 deemed adequate), and only the 3.2-m headrope, 0.64-cm bar mesh trawl would be used.

The current gear is a 3.2-m otter trawl with 6.4-mm bar mesh body netting of 210/6 size twine and a tailbag mesh of 3.2-mm Delta-style knotless nylon with a 150-mesh circumference and 450-mesh length. The gear is towed for one minute during daylight hours during similar tidal stages and covers 75 yards.

Environmental data are recorded, including temperature, salinity, dissolved oxygen, wind speed, and direction. Additional habitat fields were added in 2008.

2.2.1.2 Sampling Intensity

Prior to 1989, sampling was monthly. From 1989 to 2003, a fixed set of 105 core stations was identified and sampling was conducted in May and June only. Since 2004, additional July sampling of a subset of the core stations has been conducted.

2.2.1.3 Biological Sampling

Catch is sorted by species and total number of individuals for each species is recorded. A subset of at least 30–60 individuals of all target species (economically important species) is measured for total length.

2.2.1.4 Potential Biases & Uncertainty

Spotted seatrout are a target species of this survey. Fixed sampling stations are located in primary nursery areas. Sampling does not occur in deeper open water areas where juvenile spotted seatrout may occur. Sampling is limited to May, June, and July and sampling in July only occurs at a subset of stations. Because of the fixed sampling design, if spotted seatrout abundance shifts it is less likely to be reflected in the July sampling.

A fixed-station survey can run the risk of bias if the sites selected do not adequately represent the sampling frame. Additionally, even if the sites adequately cover the sampling frame, the increased variation that would come about from sampling randomly is not accounted for and is therefore neglected in the calculation of variance.

2.2.1.5 Development of Estimates

The Program 120 data were used to develop an index of age-0 relative abundance for spotted seatrout starting in 2004. To provide the most relevant index, data were limited to those collected during June and July when the majority of age-0 spotted seatrout occur in the survey. A generalized linear model (GLM) framework was used to develop the index. The response variable included both positive and zero catches. Effort was consistent across tows so there was no need for an offset variable. Potential covariates were evaluated for collinearity by calculating variance inflation factors, applying a correlation analysis, or both. Collinearity exists when there is correlation between covariates and its presence causes inflated p-values. All available covariates were included in the initial model and assessed for significance using likelihood ratio statistics. Non-significant covariates were removed using backwards selection to find the best-fitting predictive model for each species. AIC was used to confirm the choice of the final model. The model chi-square statistic was calculated for the best-fitting model to determine if the overall model was statistically significant.

2.2.1.6 Estimates of Program 120 Survey Statistics

The best-fitting GLM for the Program 120 index of age-0 abundance for spotted seatrout included year, sampling location, bottom temperature, and bottom salinity as significant covariates. The resulting index varied without trend over the time series (Table 2.8; Figure 2.19). Peaks in age-0 relative abundance were observed in 2008 and 2012, suggesting relatively higher recruitment in those years.

2.2.2 Fisheries-Independent Gill-Net Survey (Program 915)

2.2.2.1 Survey Design and Methods

The Fisheries-Independent Gill-Net Survey, also known as Program 915 (P915), began on March 1, 2001 and includes Hyde and Dare counties (Figure 2.20). In July 2003, sampling was expanded to include the Neuse, Pamlico, and Pungo rivers (Figures 2.21, 2.22). Additional areas in the Southern District were added in April 2008 (Figure 2.23).

Floating gill nets are used to sample shallow strata while sink gill nets are fished in deep strata. Each net gang consists of 30-yard segments of 3-, 3.5-, 4-, 4.5-, 5-, 5.5-, 6-, and 6.5-inch stretched mesh, for a total of 240 yards of nets combined. Catches from an array of gill nets comprise a single sample; two samples (one shallow, one deep)—totaling 480 yards of gill net—are completed each trip. Gill nets are typically deployed within an hour of sunset and fished the following morning. Efforts are made to keep all soak times within 12 hours. All gill nets are constructed with a hanging ratio of 2:1. Nets constructed for shallow strata have a vertical height between 6 and 7 feet. Prior to 2005, nets constructed for deep and shallow strata were made with the same configurations. Beginning in 2005, all deepwater nets were constructed with a vertical height of approximately 10 feet. With this configuration, all gill nets were floating and fished the entire water column.

A stratified random sampling design is used, based on area and water depth. Each region is overlaid with a one-minute by one-minute grid system (equivalent to one square nautical mile) and delineated into shallow (<6 feet) and deep (>6 feet) strata using bathymetric data from NOAA navigational charts and field observations. Beginning in 2005, deep sets have been made along the 6-ft contour. Sampling in Pamlico Sound is divided into two regions: Region 1, which includes areas of eastern Pamlico Sound adjacent to the Outer Banks from southern Roanoke Island to the northern end of Portsmouth Island; and Region 2, which

includes Hyde County bays from Stumpy Point Bay to Abel's Bay and adjacent areas of western Pamlico Sound. Each of the two regions is further segregated into four similar sized areas to ensure that samples are evenly distributed throughout each region. These are denoted by either Hyde or Dare and numbers 1 through 4. The Hyde areas are numbered south to north, while the Dare areas are numbered north to south. The rivers are divided into four areas in the Neuse River (Upper, Upper-Middle, Lower-Middle, and Lower), three areas in the Pamlico River (Upper, Middle, and Lower), and only one area for the Pungo River. The upper Neuse area was reduced to avoid damage to gear from obstructions, and the lower Neuse was expanded to increase coverage in the downstream area. The Pungo area was expanded to include a greater number of upstream sites where a more representative catch of striped bass may be acquired.

2.2.2.2 Sampling Intensity

Initially, sampling occurred during all 12 months of the year. In 2002, sampling during December 15 to February 14 was eliminated due to extremely low catches and unsafe working conditions. Sampling delays were extensive in 2003, so this year was excluded from analysis because of the lack of temporal completeness. Sampling in the Pamlico, Pungo, and Neuse rivers did not begin until July 2003. Each of the sampling areas within each region is sampled twice a month. Within a month, a total of 32 samples are completed (eight areas \times twice a month \times two samples) in both the Pamlico Sound and the river systems.

2.2.2.3 Biological Sampling

All fish are sorted by species. A count and a total weight to the nearest 0.01 kg, including damaged (partially eaten or decayed) specimens, are recorded. Length, age, and reproductive samples are taken from selected target species, including spotted seatrout. Samples are processed according to the ageing project protocols. The sex of all aged fish is also recorded. The numbers of biological samples collected in Program 915 is summarized in Table 2.9.

2.2.2.4 Potential Biases & Uncertainty

Spotted seatrout are a target species in Program 915. The survey is designed to collect data of fish using estuarine habitats but nearshore ocean areas, which may be utilized by spotted seatrout, are not sampled. In addition, shallow creeks, which are often utilized by spotted seatrout as overwintering habitat and many deepwater areas of Pamlico Sound, potentially used for spawning, are not sampled in Program 915. Despite being utilized by spotted seatrout and being areas of high fishery activity, Albemarle Sound and estuarine areas from Core Sound to New River are not sampled by this program. Ellis (2014) noted acoustic tagged spotted seatrout seemed to avoid anchored gill nets, indicating catchability of this species using Program 915 gear may be an issue.

While sample design has been largely consistent some adjustments have been made with the goal of reducing sea turtle interactions. In 2005, some deep water grids were dropped in Pamlico Sound, and in 2011 one area strata in eastern Pamlico Sound was not sampled for a three-month period from June–August to reduce sea turtle interactions. This change eliminated 16 samples per year. In addition, sampling in the southern district varies slightly from sampling in the Pamlico Sound. Only shallow water sets in the Cape Fear River below the downstream junction of the Cape Fear and Brunswick rivers are used. New River has shallow and deep water sets with areas separated by a line going from Rhodes Point to the northern bank of French's Creek and an upper boundary at the 17 bridge in Jacksonville. In

2007, soak times in the southern district were reduced to four hours for sets made from April–September in order to reduce sea turtle interactions.

2.2.2.5 Development of Estimates

Four indices of relative abundance were developed from the Program 915 data—spring, summer, fall, and southern indices. The southern index is important as it includes areas of known high abundance for the recreational fishery in the New River as well as the Cape Fear River. The addition of the southern index also expands collection of biological information to all coastal areas of North Carolina. The spring index was based on data from May and June. The summer index used data from July and August. The fall index was based on data collected from September through November. The southern index was based on data collected in May and June from the southern sampling stations that were added in 2008. For Stock Synthesis, the assessment model used here, it is important to associate each index with the time of year it occurs so the model can account for the growth and mortality that occurs before the index operates.

A GLM approach similar to the one used to develop the Program 120 age-0 index was used (see section 2.2.1.5). For the Program 915 indices, stratified GLMs were applied to take into account the stratified design of the survey. Because there was some variability in effort (soak time in hours) among hauls, effort was included as an offset variable in the GLM.

Length data were summarized by 2-cm length bins and year. Age data were summarized by year and sex. Length and age data were summarized for each index; that is, they are based on collections from the same months of the associated index.

2.2.2.6 Estimates of Program 915 Survey Statistics

The best-fitting GLM for the spring index included year, depth, bottom temperature, and bottom DO as significant covariates. The final model for the summer index included year, depth, bottom temperature, and bottom salinity. The best model for the fall index included year, depth, and bottom salinity. The GLM analysis indicated that year was the only significant covariate for the southern index so this index was instead calculated using the traditional estimator for a random stratified average.

All four Program 915 indices varied without trend over the respective time series (Table 2.8; Figures 2.24–2.27). A peak was observed in 2009 in the spring (Figure 2.24), summer (Figure 2.25), and southern (Figure 2.27) indices. This corresponds with the peak observed in 2008 in the Program 120 age-0 index (Figure 2.19). The fall index exhibited a peak in 2006 (Figure 2.26). All the Program 915 indices suggest an increase in 2012 to varying degrees.

Annual length-frequency distributions for the Program 915 survey indices are shown in Figures 2.28–2.31. Age-frequency plots for Program 915 are presented in Figures 2.32–2.35.

2.3 Evaluation of Observed Data Trends

2.3.1 Analyses

The Mann-Kendall test was performed to evaluate trends in the indices. The Mann-Kendall test is a non-parametric test for monotonic trend in time-ordered data (Gilbert 1987). The test was applied to the Program 120 age-0 index and the four indices (spring, summer, fall, southern) derived from the Program 915 survey. Trends were considered statistically significant at $\alpha = 0.025$.

Correlation analyses—both Pearson’s and Spearman’s rank—were also applied to the five fisheries-independent surveys for spotted seatrout. An additional index was created by lagging the Program 120 by one year for inclusion in these analyses.

2.3.2 Results

The Mann-Kendall test was applied to the five survey indices independently. The results showed no detectable trends in relative abundance over the respective time series (Table 2.10).

The Pearson’s correlation analysis showed significant and positive correlations between the Program 915 spring and summer indices and between the lagged Program 120 age-0 index and both the Program 915 spring and summer indices (Table 2.11). The Spearman’s rank analysis detected significant and positive correlations among the Program 915 spring, summer, and fall indices (Table 2.11). Significant correlations were found between the unlagged Program 120 age-0 index and both the Program 915 summer and fall indices. The Spearman’s rank analysis also showed significant positive correlations between the lagged Program 120 age-0 index and both the Program 915 spring and south indices.

3 ASSESSMENT

3.1 Overview

3.1.1 Scope

The unit stock for the current assessment is considered all spotted seatrout occurring within Virginia and North Carolina waters.

3.1.2 Summary of Methods

The current assessment applied two methods to the available data. First, catch curves were used to estimate total mortality. Second, the Stock Synthesis model was used to estimate fishing mortality (F), spawning stock biomass (SSB), and associated reference points.

3.1.3 Current vs. Previous Method

The 2009 NCDMF spotted seatrout assessment modeled population dynamics using data collected from 1991 to 2008 (Jensen 2009). ASAP (version 2.0.17)—a forward-projecting age-structured model—was applied to the available data. The inputs included commercial landings at age, recreational catch at age, and three indices of abundance. An index based on the NCDMF Fishery-Independent Gill-Net Survey (Program 915) in Pamlico Sound served as the only fisheries-independent index. Data from the North Carolina Trip Ticket Program were used to develop a fisheries-dependent index for 1994 to 2008. Another fisheries-dependent index was developed based on data collected in the MRFSS program.

The current assessment uses a length-based, age-structured model that accounts for sex-specific differences in mortality and growth. This model requires less preprocessing (i.e., manipulating of data into a simpler format) of data than the ASAP model, keeping the input close to the natural basis of the observations. Only fisheries-independent surveys were used to derive indices of relative abundance in the current assessment. Unlike the previous assessment, an index of age-0 abundance was available for this assessment. The current assessment incorporates tag-recapture information and also had access to data from 2009 through 2012.

3.2 Catch Curve Analysis

Total mortality rates were also estimated using linearized catch curves. All (both fisheries-dependent and fisheries-independent) available age data collected by the NCDMF and the VMRC from 1998 through 2012 were used. Sample numbers at age were plotted on a logarithmic scale and a straight line was fit to points corresponding to the fully recruited age-classes. The instantaneous total mortality rate was estimated as the slope of the fitted line. Age of full recruitment was determined to be one year based on the catch curve plots.

The catch curve analysis was applied to synthetic cohorts and true cohorts. Catch curves of synthetic cohorts were based on the estimated abundance of successive age-classes within a particular year. The synthetic cohort represents multiple year-classes observed in a single year. This approach assumes recruitment is constant across years, fishing and natural mortality rates are constant, and vulnerability to the sampling gear is constant for fully recruited age-classes. The assumption of constant recruitment can be avoided by applying the catch curves to individual year-classes over time (i.e., true cohorts). Catch curves were also developed for true cohorts. This approach still assumes constant mortality and equal vulnerability to the sampling gear above a certain age.

Catch curve estimates of total mortality were calculated for each year based on synthetic cohorts and for all year-classes based on true cohorts. Total mortality rates for true cohorts were estimated only for cohorts that have passed completely through the survey.

Total mortality rates were also estimated using Heincke's method (1913, cited in Ricker 1975) for comparison. In Heincke's method, successive ages are weighted by their abundance. This method can be useful if the ages of older fish are unreliable; as older fish tend to be less common in a sample, their numbers would be given less weight.

3.3 Stock Synthesis

3.3.1 Description

The spotted seatrout assessment is based on a forward-projecting length-based, age-structured model that can incorporate tag-recapture data. A two-sex model is assumed. The stock was modeled using Stock Synthesis text version 3.24f software (Methot 2000, 2012; NFT 2011; Methot and Wetzel 2013). Stock Synthesis was also used to calculate reference points. The Stock Synthesis model can incorporate information from multiple fisheries, multiple surveys, and a variety of biological data. The structure of the model allows for a wide range of model complexity depending upon the data available. The strength of the synthesis approach is that it explicitly models both the dynamics of the population and the processes by which one observes the population and its fisheries. That is, the comparison between the model and the data is kept close to the natural basis of the observations, instead of manipulating the observations into the format of a simpler model. Another important advantage is that the Stock Synthesis model can allow for (and estimate) selectivity patterns for each fishing fleet and survey. Please refer to the model documentation for details on model assumptions and equations (see Methot 2000, 2012; Methot and Wetzel 2013).

The input files for the base model run are available upon request.

3.3.2 Dimensions

The time period modeled was 1991 through 2012. In the model, years are defined as fishing years where the year starts in March and ends in February of the following year; that is, the

actual time period modeled was March 1991 through February 2013. The start year of 1991 was selected because this was the first year that age data for spotted seatrout were available. The end year was chosen due to the unavailability of final landings data for the latter half of 2013 at the time of the assessment.

The initial model was set up as a seasonal model, but that model would not converge on biologically realistic results. As such, an annual time step was used.

3.3.3 Structure / Configuration

The model incorporated three fishing fleets—commercial estuarine, commercial ocean, and recreational—and five fishery-independent surveys. The Program 120 survey was assumed to index age-0 recruitment in the model. The four components (spring, summer, fall, and south) of the Program 915 survey were treated as indices of total relative abundance.

3.3.3.1 Catch

Annual landings were entered for each of the three fishing fleets. Dead discards were available and input for the commercial estuarine fishery and the recreational fishery.

3.3.3.2 Survey Indices

Changes in indices over time can occur due to factors other than changes in abundance; indices were standardized using a GLM approach in order to attempt to remove the impact of some of these factors (Maunder and Punt 2004; see section 2). Catchability (q) was estimated for each survey and allowed to vary over time via a random walk (see Wilberg et al. 2010). Annually variable catchability is especially likely for fishery-independent data when a survey does not cover the full area of the stock, as is the case for NCDMF Programs 120 and 915. All survey indices were assumed to have a linear relation to abundance.

3.3.3.3 Selectivity

The selectivity for both commercial fleets was assumed to be dome shaped. The selectivity for the recreational fishery and Program 915 multi-mesh gill-net survey was assumed to follow an asymptotic pattern.

3.3.3.4 Length Composition

Annual length frequencies were input for the commercial estuarine fishery, commercial ocean fishery, recreational fishery, and each component of the Program 915 survey (see section 2). Length frequencies for the surveys were calculated using the same reference data used to develop the indices. That is, the length frequencies for spring component of Program 915 were calculated from data collected during May and June. Length frequencies for the summer component of Program 915 were calculated from data collected during July and August. Length frequencies for the fall component of Program 915 were calculated from data collected during September and November. Finally, length frequencies for the southern component of Program 915 were calculated from data collected from southern sampling stations during May and June.

3.3.3.5 Age Data

Annual sex-specific age compositions were input for the commercial estuarine fishery, commercial ocean fishery, recreational fishery, and each component of the Program 915 survey. The age data were input as raw age-at-length data, rather than age compositions generated from applying age-length keys to the catch-at-length compositions. The input

compositions are therefore the distribution of ages obtained from samples in each length bin (conditional age-at-length). This is considered a superior approach because: (1) it avoids the double use of fish for both age and size information because the age information is considered conditional on the length information; (2) it contains more detailed information about the relationship between size and age so provides stronger ability to estimate growth parameters, especially the variance of size at age; and (3) the conditional age-at-length approach can directly match the protocols of the sampling program when age data are collected using a length-stratified approach (Methot 2012).

As with the length frequencies, the survey age compositions were calculated using the same reference data used to develop the indices. Age 6 was treated as a plus group that included ages 6 through 9.

There have been no true age validation studies conducted for spotted seatrout. Comparison of multiple reads suggests negligible between-reader bias (NCDMF, unpublished data). Ageing error was assumed minimal in the model.

3.3.3.6 Biological Parameters

Natural Mortality

Natural mortality (M) is one of the most important, and often most uncertain, parameters used in stock assessments. This is an especially important parameter for spotted seatrout as work by Ellis (2013, 2014) has demonstrated high inter-annual variability in natural mortality; during periods of cold stuns, natural mortality can greatly increase.

Based on relation to winter temperature and availability of temperature data, Ellis (2014) was able to derive M estimates for the 1994 through 2012 time period. The original base model developed for this assessment incorporated these annual estimates of natural mortality. This model and similar configurations failed to converge. Attempts were also made to incorporate winter-only temperatures and these models also failed to converge. Model configurations in which the natural mortality was set at a constant lower value during non-cold-stun years and set at a constant higher value during cold-stun years—dubbed the “hi-lo” model scenarios—also failed to converge. Attempts to build the relation between M and temperature directly into the model were also unsuccessful.

After exhaustive attempts to incorporate varying M , the working group was forced to abandon this option and rely on an alternative method for assuming natural mortality. The choice was to use a life history-based method to derive age- and sex-specific estimates of M (instead of assuming an age-constant M). Lorenzen’s (1996) approach, used here, requires estimates of parameters from the von Bertalanffy age-length growth function, estimates of parameters from the allometric length-weight relationship, and the range of ages over which M will be estimated (Table 3.1).

Growth

The von Bertalanffy age-length growth option in Stock Synthesis is parameterized in terms of length at a given reference age, L_{∞} , and K . The selected reference age was age 1. The von Bertalanffy parameters were assumed to be sex-specific and fixed in the model at the values estimated in this report (see section 1.2.4; Table 1.1; Figure 1.1).

Parameters of the allometric length-weight relationship were fixed for both males and females. The assumed values were those estimated in this report as described in section 1.2.4 (Table 1.2; Figure 1.2).

Maturity

The length logistic maturity option in Stock Synthesis was selected for defining female maturity. The maturity parameters were fixed in the model at the values estimated in section 1.2.5.

Fecundity

The selected fecundity option in Stock Synthesis was that which causes eggs to be equivalent to spawning biomass.

3.3.3.7 Stock-Recruitment

A Beverton-Holt stock-recruitment relationship was assumed. Recruitment varied log-normally about the curve. The steepness parameter (h) was fixed at 0.9 because there was not enough contrast in the time series to estimate this value reliably (R. Methot, NOAA Fisheries, personal communication). Virgin recruitment (R_0) was estimated by the model.

3.3.3.8 Initial Conditions

Non-equilibrium conditions were assumed for the initial age structure.

3.3.3.9 Tag-Recapture Data & Parameters

The tag-recapture data are entered as the number of releases by group and year and the number of returns by group, year, and fleet (fishery). Annual releases of tagged fish were considered to belong to the same tag group. Over 6,500 hundred spotted seatrout were tagged and released between 2008 and 2012 (Table 3.2; Ellis 2013, 2014). Over 500 spotted seatrout that were tagged were recaptured during the same time period (Table 3.3). The majority of recaptures occurred in the recreational fishery.

In Stock Synthesis, fish belonging to a tagged group are all assumed to consist of a single age class (Methot 2012). The majority of tagged fish were age 1 (Ellis, NCSU, personal communication). For the current assessment, the age of spotted seatrout in all tag groups was set at 1.

Initial and chronic tag loss were assumed equal for all fleets and set at the values estimated by Ellis (2013, 2014). Reporting rates also came from the work of Ellis (2013, 2014) but separate values were available for commercial (estuarine and ocean assumed the same) and recreational fleets. The exponential decay rate in reporting rate for each fleet was assumed negligible. A mixing latency period of 1 (1 year) was assumed; this is the time that elapses before comparing observed to expected recoveries.

Use of the tag-recapture component of Stock Synthesis allows for estimation of an overdispersion parameter. Setting this parameter to 1 assumes the distribution of recaptures is random (Poisson). Assuming larger values (>1) allows for departure from this assumption via the negative binomial; the value assumed describes the degree of departure from the Poisson assumption. A likelihood profile technique was applied to the base model to determine the best value for the overdispersion parameter. A range of values from 1 through 10 were examined and a value of 5 resulted in the best likelihood.

3.3.4 Optimization

Stock Synthesis assumes an error distribution for each data component and assigns a variance to each observation. Commercial landings were assumed well known and fit in the model assuming a lognormal error structure with a minimal observation error ($SE = 0.05$). Recreational harvest was also fit assuming a lognormal error structure with a minimal observation error ($SE = 0.10$). Composition information was fit assuming a multinomial error structure with variance described by the effective sample size. For each fleet and survey, the effective sample size was the number of sampled trips assuming a maximum of 200. Survey indices were fit assuming a lognormal error distribution with variance estimated during the GLM standardization.

The objective function for the base model included likelihood contributions from the landings, discards, survey indices, length compositions, age data, initial equilibrium catch, recruitment deviations, and tag composition data. The total likelihood is the weighted sum of the individual components. All likelihood components were given equal weight in the base model (assigned a lambda weight of 1.0).

No prior assumptions were made regarding the estimated parameters (i.e., no priors were used); however, bounds were established on all parameters to prevent estimation of unrealistic parameter values and convergence problems.

3.3.5 Diagnostics

Standardized residuals provide an indication of how well the data fit the model. Standardized residuals were calculated for the fishery-independent indices. In a perfectly fit model, the standardized residuals are normally distributed with mean 0 and standard deviation 1. Normal quantile plots (Q-Q plots) and distribution tests were applied to the survey index residuals to determine whether the standardized residuals were normally distributed.

3.3.6 Uncertainty & Sensitivity Analyses

In the base model, each component of the likelihood function was given a weight of one. The contribution of a data source can be manipulated by changing this value. Here, the uncertainty of the base model results was explored by assessing the contribution of different sources of information using this approach. In a series of runs, the contribution of each survey was examined by reducing the emphasis (assigned a lambda weight of 0.0001) of all inputs (index, length compositions, age data) derived from the particular survey. The contribution of each type of biological data (length compositions, age data) from all sources was also explored through this approach. The tagging data were down-weighted in another sensitivity run.

The sensitivity of the base model to assumptions about the stock-recruitment relationship was also investigated. The base model run assumed steepness was equal to 0.9. Additional runs were performed for a range of steepness values from 0.5 to 1.0.

The sensitivity to the base model's assumption of dome-shaped selectivity for the commercial estuarine and commercial ocean fisheries was evaluated by running a model in which the selectivity of both commercial fisheries was fixed to an asymptotic shape.

The base model assumed time-varying catchability for each of the survey indices. This assumption was investigated by running a model in which catchability was assumed time-invariant for each of the survey indices.

Finally, a retrospective analysis was run to examine the consistency of estimates over time. This type of analysis gives an indication of how much recent data have changed our perspective of the past (Harley and Maunder 2003).

3.3.7 Results

3.3.7.1 Catch Curve Analysis

Catch curve estimates of total mortality ranged from 0.69 to 1.5 based on true cohorts (Figure 3.1) and ranged from 0.75 to 1.3 based on synthetic cohorts (Figure 3.2). The catch curve applied to true cohorts indicated that total mortality was highest for the 1998, 2001, 2007, 2008 and 2009 year classes (Figure 3.1). Total mortality rates were highest in 1992, 2004, and 2005 based on the analysis of synthetic cohorts (Figure 3.2). The estimates produced by the linearized catch curve approach were similar in trend and magnitude to the estimates computed using Heincke's approach for both true (Figure 3.3) and synthetic cohorts (Figure 3.4). The results of both the catch curve analysis and Heincke's method suggest that total mortality is variable across time, consistent with the results of Ellis (2013, 2014).

3.3.7.2 Stock Synthesis Model

A summary of the data that was input into the Stock Synthesis model base run is summarized in Table 3.4.

The base assessment model estimated that recruitment was variable without trend over the time series (Table 3.5; Figure 3.5). A decrease in recruitment was estimated in the final years of the time series. Estimated SSB was also variable over the time series (Table 3.5; Figure 3.6). There was a pronounced increase in SSB that occurred from the early to late 2000s. Virgin SSB was predicted to equal 2,223 mt.

Stock Synthesis allows several options for reporting F . Based on a recommendation from the model developer (R. Methot, pers. comm.), the F values reported here represent a real annual F calculated as a numbers-weighted F (see Methot 2012) for ages 1–4, the age range that comprises the majority (92.8%) of the total catch. Note that the F that is traditionally reported is apical F —the maximum F over all ages. Predicted F values ranged from a low of 0.134 in 2010 to a high of 0.638 in 1999 (Table 3.5; Figure 3.7). The highest estimated F values matched up with known cold-stun years in 1995, 1999, 2000, and 2009.

Estimated population numbers at age for females and males are presented in Tables 3.6 through 3.9. There is some indication that the age and length distributions may be showing evidence of an expansion in recent years.

The fitted selectivity patterns suggest the commercial estuarine fishing gear selects for larger size spotted seatrout than the commercial ocean gear (Figure 3.8). The estimated selectivity patterns for the various components of the Program 915 survey are nearly identical (Figure 3.9). Recall that the index derived from Program 120 was input as an index of age-0 relative abundance so selectivity for age-0 fish was equal to 1.0 for this survey.

The assessment model provided near perfect fits to the survey indices (Figures 3.10–3.14); for this reason, standardized residuals and normal quantile plots were not developed. The extremely good fits are attributed to the time-varying catchability (Figures 3.15–3.19). When catchability was not allowed to vary over time, the fits were reasonable but not as good as in the base run.

The model performed well in predicting the length-frequency distributions of the fisheries (Figures 3.20–3.23) and the surveys (Figures 3.24–3.27). The fit to the tag-recapture data was considered poor (Figure 3.28).

The model estimates of SSB and F were relatively insensitive to removal of various sources of survey data (Figure 3.29). Removal of the length data had the most impact of all the sensitivity analysis and resulted in dramatic changes in the magnitude of estimated SSB and F (Figure 3.30). The model did not converge when the age data were removed. De-emphasizing the tagging data essentially had no impact on the model results (Figure 3.31). Changing the assumption regarding the shape of the selectivity curve for the commercial fisheries from dome-shaped (base run) to asymptotic slightly impacted the magnitude of results and resulted in a much higher terminal F (Figure 3.32). Changing the assumption of time-varying catchability coefficients to time-constant catchabilities had a minor impact on estimated F and SSB in the most recent years (Figure 3.33); though not shown here, the fit to the survey indices degraded when catchabilities were fixed over time. The model appeared insensitive to changing assumptions about the steepness value (Figure 3.34), though an error message indicated poor convergence when steepness was equal to 1.

For the retrospective analysis, the model would not converge when “peeled” back to 2011 and 2008. Based on the runs that did converge, there is indication of overestimation of SSB in the terminal year (Figure 3.35). There is no clear pattern of over- or underestimation in terminal F .

3.4 Discussion of Results

The results of the catch curve analyses and Stock Synthesis suggest that mortality of spotted seatrout is variable over time. This result is consistent with the results of work by Ellis (2013, 2014). The estimates of fishing mortality from the base run of the assessment model were lower than those estimated by Ellis (2013, 2014) for the years in which comparisons could be made (Figure 3.36).

The spotted seatrout resource is a difficult stock to assess. The population is subject to intermittent cold-stun events, which greatly increases the variance in natural mortality experienced by the stock during these episodes. Despite exhaustive efforts, it was not possible to get a working model that incorporated annual variation in natural mortality for the current assessment. Future assessment work should continue to attempt to account for these cold-stun events and the associated increases in natural mortality. Most stock assessments do not have such strong evidence for such variation in natural mortality, a critical factor to consider in a stock assessment.

There is evidence from the last decade of the assessment that there are a higher proportion of larger (Figures 2.28–2.31) and older (Figures 2.32–2.35) individuals, suggesting that the age structure of the stock is likely to be expanding. However, an abrupt decline is evident in the estimated recruitment after 2010 (Table 3.5; Figure 3.5), although this is not mirrored in the survey data (Figure 2.19). Spawning stock biomass increased to its maximum in 2007 but has since declined to close to the average (Table 3.5; Figure 3.6). Fishing mortality has varied without apparent trend, but periods of high fishing mortality seem to coincide with SSB decline and this is probably related to cold stun events (Table 3.5; Figures 3.6 and 3.7).

Results from the current assessment were considerably different than the previous assessment (Figure 3.37; Jensen 2009). The F reported in the previous assessment represented a numbers-weighted fishing mortality for ages 1 to 6+ while the F reported in this assessment represents a numbers-weighted fishing mortality for ages 1 to 4; however, this minor difference does not explain the on average 4-fold difference in predicted values between the two assessments. Likewise, estimates of SSB in the current assessment are on average 4.5 times higher than SSB estimates from the previous assessment. These differences are in part, at least, attributable to the difference in the model inputs. The previous assessment used two fisheries-dependent indices of abundance, which are associated with numerous biases (see section 1.6.2, number 5). There was no index of juvenile abundance available for the previous model. The current model incorporates both length and age data, which includes thousands of length samples. Estimates of growth and maturity are slightly improved and the current model incorporates tagging data. The current model is sex-specific, which can account for differences in growth and mortality between the sexes. Some differences may also result from differences in how the assessment models operate. For example, the Stock Synthesis performs better with regard to accounting for errors in the observation process and so likely produces more realistic estimates of error. Both assessments used the best available data at the time and should be considered the best available science when conducted.

4 STATUS DETERMINATION CRITERIA

The General Statutes of North Carolina define overfished as “the condition of a fishery that occurs when the spawning stock biomass of the fishery is below the level that is adequate for the recruitment class of a fishery to replace the spawning class of the fishery” (NCGS § 113-129). The General Statutes define overfishing as “fishing that causes a level of mortality that prevents a fishery from producing a sustainable harvest.”

The NCDMF FMP for spotted seatrout defines the stock’s thresholds in terms of 20% spawning potential ratio (SPR; NCDMF 2012b). Targets for the stock are based on 30% SPR. The Stock Synthesis model was used to estimate reference points for the stock. The model estimated $SSB_{20\%}$ at 394 mt and $SSB_{30\%}$ at 623 mt. The estimate of SSB for 2012—the terminal year of the assessment—was 1,140 mt. Based on these results, the stock is not currently overfished ($SSB_{2012} < SSB_{20\%}$) and has not been overfished during the 1991 to 2012 time period (Figure 4.1).

Estimated $F_{20\%}$ is 0.656 and $F_{30\%}$ is 0.422. The estimate of terminal year F was 0.401, suggesting the stock is not experiencing overfishing ($F_{2012} < F_{20\%}$). Evaluation of the time series indicates the stock has not experienced overfishing during the assessment time period (Figure 4.2).

5 SUMMARY OF PEER REVIEW COMMENTS

Stocks assessments performed by the NCDMF in support of management plans are subject to an extensive review process. Internal reviews are conducted by various groups within the NCDMF including the species Plan Development Team, the Biological Review Team Technical Committee, and the Management Review Team. External reviews are designed to provide an independent peer review and are conducted by experts in stock assessment science and experts in the biology and ecology of the species. The goal of the external review is to ensure the results are based on sound science and provide a valid basis for management.

The stock assessment was reviewed by a panel of three independent reviewers, representing experts in stock assessment or spotted seatrout biology. The peer reviewers agreed that the assessment provided a valid basis for management for at least the next five years, given the available data and current knowledge of the species stock dynamics and fisheries. One reviewer added the caveat that periodic mass mortalities have the potential to lead to population bottlenecks where added protections might be wise to let the population recover. He added that he didn't see anything in the SSB trajectory that suggests this problem occurred during the fairly frequent freeze events in the 1990s and 2000s. Another reviewer stated that, in general, using the terminal year of an assessment for status determination may be a requirement, but the terminal estimates of stock size, and especially recruitment estimates, tend to change after those cohorts have a stanza or two exposed to the fisheries. He continued that as the only index of recruitment is relatively short, there will be additional likelihood of variation in those estimates of recruitment with more time and data.

In March 2015, the NCDMF agreed that the stock assessment provided a valid basis for management.

6 RESEARCH RECOMMENDATIONS

The following research recommendations are offered (ranked by priority) to improve the next assessment of the North Carolina spotted seatrout stock:

High

- Histological maturity; fecundity evaluation/batch fecundity
- Validate juvenile abundance survey; improve juvenile abundance survey through expansion and addition of random stations (or replace fixed design with random or random stratified)
- Continue and expand tagging studies for estimating natural and fishing mortality, understanding stock structure, and examining migration (e.g., ocean vs. creeks)
- Collect data to characterize the length distribution of recreational releases
- Conduct further studies to identify appropriate unit stock
- Develop a custom model that allows for incorporation of variable natural mortality rates
- Develop a fishery-independent survey for Virginia waters

Medium

- Initiate surveys that assess spotted seatrout winter and spawning habitats
- Compare maturity ogives between North Carolina and Virginia
- Improve discard estimates
- Conduct further studies to estimate discard mortality by gear and sector
- Investigate relationship between environmental variables and adult and juvenile mortality
- Selectivity of program 915 indices—gear/availability

Low

- Collect more age and sex samples from the recreational fishery
- Evaluate influences of salinity on release mortality
- Conduct marginal increment analysis
- Conduct an age validation study

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8 TABLES

Table 1.1. Estimated parameter values of the von Bertalanffy age-length model fit to spotted seatrout data from this and previous studies, where length is measured in centimeters.

Location	Collection Dates	Gear	Structure	Sex	n	L_{∞}	K	t_0	Reference
Galveston Bay, Texas	October 1981–September 1982	exp gill nets (most) and hook and line	sectioned otoliths	Male		66.4	0.179	1.939	Maceina et al. 1987
Galveston Bay, Texas	October 1981–September 1982	exp gill nets (most) and hook and line	sectioned otoliths	Female		68.7	0.512	-0.260	Maceina et al. 1987
Charlotte Harbor, Florida	February 1986–January 1988	hook and line, seine, gill and trammel nets	sectioned otoliths	Female	1,102	69.8	0.363	0.39	Murphy and Taylor 1994
Indian River Lagoon, Florida	February 1986–January 1988	hook and line, seine, gill and trammel nets	sectioned otoliths	Female	1,195	83.9	0.362	0.74	Murphy and Taylor 1994
Apalachicola Bay, Florida	March 1986–January 1988	hook and line, seine, gill and trammel nets	sectioned otoliths	Female	797	81.8	0.350	0.68	Murphy and Taylor 1994
Virginia/North Carolina	1991–2013	various	otolith	Male	6,764	66.9	0.3142	-0.938	This study
Virginia/North Carolina	1991–2013	various	otolith	Female	10,914	79.4	0.3406	-0.588	This study

Table 1.2. Estimated parameter values of the allometric length-weight function fit to spotted seatrout data from this and previous studies, where length is measured in centimeters and weight is measured in kilograms.

Location	Collection Dates	Gear	Sex	n	<i>a</i>	<i>b</i>	Reference
Indian River Lagoon, Florida	February 1986-January 1988	hook and line, seine, gill and trammel nets	Female	1,194	5.75E-06	3.12	Murphy and Taylor 1994
Indian River Lagoon, Florida	February 1986-January 1988	hook and line, seine, gill and trammel nets	Male	605	4.76E-06	3.17	Murphy and Taylor 1994
Apalachicola Bay, Florida	March 1986-January 1988	hook and line, seine, gill and trammel nets	Female	1,229	1.47E-05	2.86	Murphy and Taylor 1994
Apalachicola Bay, Florida	March 1986-January 1988	hook and line, seine, gill and trammel nets	Male	608	1.68E-05	2.81	Murphy and Taylor 1994
southeastern Louisiana coastal areas	January 1975-December 1978	trawl, cast net, hook and line, hoop net, gill net, seine, and trammel net	All	1,208	5.40E-06	3.15	Hein et al. 1980
Virginia/North Carolina	1991-2013	various	Male	6,909	8.59E-06	3.05	This study
Virginia/North Carolina	1991-2013	various	Female	10,242	1.07E-05	3.00	This study

Table 1.3. Total mortality of spotted seatrout in commercial gill nets by mesh size reported in Price and Gearhart (2002).

Mesh Size (in)	n	Mortality
2.5	48	90.0%
3.0	70	90.0%
3.5	71	77.0%
4.0	57	67.0%
4.5	29	66.0%

Table 1.4. Total, at-net, and delayed mortality of spotted seatrout in commercial small-mesh gill nets by season reported in Price and Gearhart (2002).

	Spring/Summer	Fall/Winter
Total Mortality	82.7%	73.8%
At-Net Mortality	76.2%	61.7%
Delayed Mortality	28.9%	31.7%

Table 1.5. At-net mortality of spotted seatrout caught in Program 915 (mesh sizes 3"-4.5" combined) by month reported in NCDMF (2012a).

Month	Mortality	n
February	20.0%	15
March	35.0%	31
April	40.0%	95
May	53.0%	185
June	75.0%	134
July	76.0%	110
August	74.0%	99
September	87.0%	224
October	64.0%	198
November	37.0%	186
December	17.0%	63
Total	60.0%	1,340

Table 1.6. Delayed mortality rates of spotted seatrout for high salinity (Outer Banks) and low salinity (rivers) areas reported in Price and Gearhart (2002).

	Outer Banks	Rivers
Spring/Summer	41.7%	23.1%
Fall/Winter	36.4%	26.3%

Table 1.7. Summary of recreational fishery release mortality estimates from a review of the literature.

Location	Mortality Estimate	Notes	Reference
Texas	up to 55.6%	artificial and natural baits	Matlock and Dailey 1981
Texas	7.30%	artificial and natural baits	Matlock et al. 1993
Texas	37.0%	artificial and natural baits	Hegen and Green 1983
Texas	11.0%	artificial and natural baits	Stunz and McKee 2006
Florida	4.60%	hook and line	Murphy et al. 1995
Louisiana	17.5%	artificial and natural baits	Thomas et al. 1997
Alabama	14.1%	treble hooks (1994)	Duffy 2002
Alabama	16.3%	single hooks (1994)	Duffy 2002
Alabama	9.10%	treble hooks (1995)	Duffy 2002
Alabama	14.6%	single hooks (1995)	Duffy 2002
North Carolina (River & Outer Banks sites in Pamlico, Core, & Roanoke sounds)	14.8%	artificial and natural baits	Gearhart 2002
North Carolina (Neuse River)	25.2%	artificial and natural baits	Brown 2007

Table 1.8. Regulatory history for the management of spotted seatrout in Virginia's commercial fishery since 1992 (as of March 2015).

Regulation	Date	Measures
450-01-0037	5/1/1992	Established 14-inch minimum size
450-01-0037	7/25/1995	Established commercial quota of 51,104 pounds
		Established seasonal management as Sept 1 through Aug 31

Table 1.9. Regulatory history of the management of spotted seatrout in Virginia's recreational fishery since 1992 (as of March of 2015).

Regulation	Date	Measures
450-01-0037	5/1/1992	Established 14-inch minimum size
		10-fish bag limit
4VAC20-280-10	4/1/2011	Bag limit of 10 fish April 1 though November 30.
		Bag limit of 5 fish December 1 through March 31 with one 24 inches or greater.
4VAC20-280-10	4/1/2014	Bag limit of 5 fish with one greater than 24 inches.
		Seasonal closure from March 1, 2014 through July 31, 2014.

Table 1.10. Proclamation history for management of spotted seatrout in North Carolina's commercial fishery since 2009 (as of February 2014).

Proclamation	Date	Measures
FF-53-2009	9/29/2009	14-inch size limit
		10-fish hook-and-line limit
		10-12-2009 deadline for dealers to be rid of unfrozen spotted seatrout
FF-82-2010	11/23/2010	Year-round weekend restriction for possession or sale
		Dealers exempted
FF-7-2011	1/12/2011	No possession
		1-20-2011 deadline for dealers to be rid of unfrozen spotted seatrout taken in the fishery, pre-closure
FF-30-2011	2/14/2011	Bycatch allowance of 10% up to 50 pounds
		Year-round weekend restriction for possession or sale
FF-56-2011	6/6/2011	14-inch size limit
		Year-round weekend restriction for possession or sale
		Dealers exempted from weekend restriction
FF-74-2011	11/10/2011	14-inch size limit
		75-fish trip limit
		Year-round weekend restriction for possession or sale in joint fishing waters
		Unlawful to set gill nets in joint fishing waters on weekends
		Albemarle and Currituck sounds exempt from both weekend restrictions
FF-9-2014	2/5/2014	No possession February 5–June 15

Table 1.11. Proclamation history for management of spotted seatrout in North Carolina's recreational fishery since 2009 (as of February 2014).

Proclamation	Date	Measures
FF-53-2009	9/29/2009	14-inch size limit
		10-fish bag limit
FF-81-2010	11/23/2010	14-inch size limit
		6-fish bag limit
		Of the six fish, only two greater than 24 inches
FF-7-2011	1/12/2011	No possession
FF-30-2011	2/14/2011	No possession
FF-57-2011	6/6/2011	14-inch size limit
		6-fish bag limit
		Of the six fish, only two greater than 24 inches
FF-75-2011	11/10/2011	14-inch size limit
		4-fish bag limit
FF-9-2014	2/5/2014	No possession February 5–June 15

Table 2.1. Number of spotted seatrout biological samples taken from Virginia's commercial fisheries by area, 1991–2012.

Biological Year	Estuarine		Ocean	
	Lengths	Ages	Lengths	Ages
1991	4	0	0	0
1992	283	0	28	0
1993	231	0	23	0
1994	668	0	20	0
1995	257	0	0	0
1996	70	0	10	0
1997	103	0	92	0
1998	373	173	3	0
1999	770	140	10	4
2000	178	63	5	5
2001	192	192	15	14
2002	452	315	2	1
2003	63	63	34	34
2004	183	182	1	1
2005	187	186	24	24
2006	794	304	18	2
2007	276	129	8	7
2008	204	192	1	1
2009	347	227	1	1
2010	230	173	1	1
2011	500	256	2	2
2012	742	252	34	3

Table 2.2. Number of spotted seatrout biological samples taken from North Carolina's commercial fisheries by area, 1991–2012.

Biological Year	Estuarine		Ocean	
	Lengths	Ages	Lengths	Ages
1991	53	67	106	105
1992	80	159	105	60
1993	79	253	136	80
1994	37	196	67	237
1995	64	246	58	27
1996	15	55	66	20
1997	83	141	70	13
1998	106	141	74	31
1999	213	150	77	29
2000	147	34	76	64
2001	122	65	61	0
2002	151	89	65	16
2003	129	38	47	19
2004	161	195	63	94
2005	180	159	67	109
2006	386	224	79	87
2007	355	197	90	8
2008	320	71	76	0
2009	384	29	47	1
2010	241	17	48	3
2011	177	51	37	29
2012	452	89	32	38

Table 2.3. Annual commercial fishery landings (metric tons) of spotted seatrout by state and area, 1991–2012.

Biological Year	Virginia		North Carolina	
	Estuarine	Ocean	Estuarine	Ocean
1991	2.48	7.57	145	190
1992	0.965	3.04	101	118
1993	2.79	13.7	127	94.5
1994	3.78	16.0	129	88.4
1995	1.71	10.8	131	114
1996	0.548	1.25	46.2	18.5
1997	0.521	4.76	67.2	36.7
1998	0.504	9.21	128	41.3
1999	2.86	13.1	221	85.3
2000	2.98	3.85	59.6	27.5
2001	7.55	1.36	31.0	9.72
2002	0.0830	3.62	85.1	15.9
2003	0.117	2.29	46.9	18.5
2004	1.47	3.43	44.6	13.3
2005	0.938	2.36	42.6	13.5
2006	2.42	12.0	140	34.8
2007	2.03	13.0	115	32.3
2008	4.42	15.6	123	21.7
2009	1.53	9.50	150	14.5
2010	1.95	5.52	44.4	5.88
2011	2.80	4.07	35.0	3.02
2012	8.61	26.0	135	7.59

Table 2.4. Numbers of spotted seatrout sampled and measured by MRIP by state, 1991–2012.

Biological Year	North Carolina		Virginia	
	Number Sampled	Number Measured	Number Sampled	Number Measured
1991	1,318	742	53	46
1992	930	543	62	57
1993	672	485	93	69
1994	1,569	1,076	311	195
1995	1,308	853	190	152
1996	642	307	93	72
1997	880	622	164	109
1998	923	551	52	46
1999	934	699	121	97
2000	535	330	87	75
2001	478	326	19	18
2002	414	283	29	23
2003	211	130	117	80
2004	582	294	77	71
2005	1,143	712	21	17
2006	1,417	658	47	30
2007	1,328	529	168	103
2008	1,099	792	152	108
2009	1,045	772	56	45
2010	441	333	42	32
2011	770	652	86	67
2012	1,473	988	164	85

Table 2.5. Numbers of spotted seatrout ages sampled from Virginia's recreational fisheries, 2004–2012.

Biological Year	Ages
2004	272
2008	8
2009	35
2010	84
2011	13
2012	12

Table 2.6. Annual recreational fishery catches of spotted seatrout in Virginia, 1991–2012.

Biological Year	Harvest (A+B1)				Released Alive (B2)	Dead Discards
	Number	PSE[Num]	Metric Tons	PSE[mt]	Number	Number
1991	72,587	41.6	61.6	42.9	33,420	3,342
1992	31,641	46.3	28.7	50.4	16,364	1,636
1993	108,442	41.8	102	44.1	54,564	5,456
1994	120,949	28.1	88.7	30.0	202,345	20,235
1995	95,516	35.6	75.2	36.3	270,877	27,088
1996	48,472	47.1	39.1	47.0	136,363	13,636
1997	97,500	41.7	133	46.6	139,255	13,926
1998	36,406	46.9	31.3	50.3	61,458	6,146
1999	145,624	46.7	147	47.9	125,373	12,537
2000	94,777	44.9	99.0	45.9	218,034	21,803
2001	14,140	66.7	13.5	43.6	90,974	9,097
2002	17,143	51.1	14.6	64.3	112,306	11,231
2003	107,762	42.2	110	42.7	170,826	17,083
2004	68,409	32.1	63.0	33.2	257,996	25,800
2005	22,062	55.8	25.4	55.2	197,904	19,790
2006	43,530	42.2	48.9	47.9	82,935	8,294
2007	159,244	26.4	172	27.1	362,936	36,294
2008	103,880	39.2	109	33.1	366,734	36,673
2009	22,635	28.8	20.3	28.0	171,028	17,103
2010	17,417	32.5	13.7	33.1	550,118	55,012
2011	247,736	38.2	250	39.3	1,214,620	121,462
2012	125,627	26.8	103	27.2	428,540	42,854

Table 2.7. Annual recreational fishery catches of spotted seatrout in North Carolina, 1991–2012.

Biological Year	Harvest (A+B1)				Released Alive (B2)	Dead Discards
	Number	PSE[Num]	Metric Tons	PSE[mt]	Number	Number
1991	336,164	18.7	216	17.9	227,412	22,741
1992	355,713	20.2	234	18.6	149,528	14,953
1993	219,955	16.2	141	14.5	173,675	17,368
1994	487,401	14.4	312	13.9	274,411	27,441
1995	347,126	17.3	220	17.3	296,580	29,658
1996	161,226	28.4	90.6	23.6	243,110	24,311
1997	273,416	19.8	143	18.1	216,508	21,651
1998	313,656	21.4	204	20.2	171,519	17,152
1999	437,009	21.8	317	20.4	429,254	42,925
2000	266,740	25.8	177	25.7	305,307	30,531
2001	193,970	24.4	98.0	21.7	424,078	42,408
2002	210,329	26.7	126	25.8	480,684	48,068
2003	113,336	31.5	67.0	28.6	179,054	17,905
2004	288,603	20.1	176	20.9	436,780	43,678
2005	629,683	19.6	327	17.0	1,362,962	136,296
2006	541,606	14.2	360	14.3	933,433	93,343
2007	547,312	14.8	421	15.0	1,413,350	141,335
2008	623,834	15.0	425	16.5	1,546,601	154,660
2009	602,096	16.2	427	16.5	1,409,926	140,993
2010	193,275	23.7	183	24.9	1,792,190	179,219
2011	229,184	12.1	198	12.7	1,995,717	199,572
2012	503,592	9.75	368	10.0	1,609,133	160,913

Table 2.8. GLM-standardized indices of abundance used as input into the stock assessment model.

	Program 120 (age-0)	Program 915	Program 915	Program 915	Program 915 (southern)
Year	June–July	May–June	July–August	September– November	May–June
2003		0.0368	0.0163	0.0459	
2004	0.188	0.0169	0.0242	0.0361	
2005	0.539	0.0125	0.0188	0.0342	
2006	1.57	0.0482	0.0295	0.0979	
2007	1.26	0.0535	0.0273	0.0432	
2008	3.55	0.0471	0.0307	0.0558	0.442
2009	1.31	0.0818	0.0395	0.0590	1.18
2010	0.435	0.0370	0.0271	0.0484	0.984
2011	0.875	0.0151	0.0270	0.0387	0.162
2012	3.05	0.0644	0.0291	0.0761	0.560

Table 2.9. Number of biological samples collected in Program 915, 2001–2012.

Biological Year	Spring (May–Jun)		Summer (Jul–Aug)		Fall (Sep–Nov)		Southern (May–Jun)	
	Lengths	Ages	Lengths	Ages	Lengths	Ages	Lengths	Ages
2001		8		6		8		
2002		15		16		29		
2003	26	18	13	9	74	31		
2004	17	10	26	10	65	31		
2005	18	12	23	13	58	26		
2006	82	39	51	25	204	79		
2007	87	41	50	21	127	64		
2008	90	63	70	42	166	100	32	28
2009	164	80	70	41	197	109	29	27
2010	51	41	41	22	126	86	24	23
2011	15	12	37	19	84	57	4	4
2012	102	81	40	27	176	157	13	13

Table 2.10. Results of Mann-Kendall trend analyses applied to the full time period for each index. *P*-value is the one-tailed probability for the trend test. Trend indicates the direction of the trend if a statistically significant temporal trend was detected (two-tailed test: $P\text{-value} < \alpha/2$; $\alpha = 0.05$); NS = not significant.

Survey Index	n	<i>P</i> -value	Trend
P120	9	0.179	NS
P915 Spring	10	0.190	NS
P915 Summer	10	0.0779	NS
P915 Fall	10	0.190	NS
P915 South	5	0.408	NS

Table 2.11. Results of correlation analyses applied to the five fisheries-independent surveys used in the spotted seatrout stock assessment. An asterisk (*) indicates a significant correlation for the associated analysis ($\alpha = 0.05$).

Variable	by Variable	Pearson's <i>r</i>	<i>P</i>-value	Spearman <i>r</i>	Prob> <i>r</i>
P915 Spring	P120	0.535	0.137	0.617	0.0769
P915 Summer	P120	0.407	0.277	0.800	0.00963*
P915 Summer	P915 Spring	0.732	0.0160*	0.806	0.00486*
P915 Fall	P120	0.516	0.155	0.750	0.0199*
P915 Fall	P915 Spring	0.584	0.0762	0.794	0.00610*
P915 Fall	P915 Summer	0.452	0.189	0.758	0.0111*
P915 South	P120	-0.329	0.589	-0.200	0.747
P915 South	P915 Spring	0.685	0.202	0.700	0.188
P915 South	P915 Summer	0.631	0.254	0.600	0.285
P915 South	P915 Fall	0.252	0.683	0.500	0.391
P120 (lag 1)	P915 Spring	0.787	0.0205*	0.714	0.0465*
P120 (lag 1)	P915 Summer	0.842	0.00879*	0.619	0.102
P120 (lag 1)	P915 Fall	0.016	0.969	0.310	0.456
P120 (lag 1)	P915 South	0.827	0.0840	0.900	0.0374*

Table 3.1. Sex-specific estimates of age-specific, instantaneous natural mortality for spotted seatrout calculated using the method of Lorenzen (1996).

Age	Male	Female
0	0.948	1.09
1	0.585	0.546
2	0.464	0.412
3	0.405	0.353
4	0.371	0.321
5	0.350	0.302
6	0.336	0.290
7	0.327	0.282
8	0.320	0.277
9	0.316	0.273

Table 3.2. Number of spotted seatrout released in the Ellis (2013, 2014) tagging study, 2008–2012.

Tag Group	Year	n Released
1	2008	818
2	2009	975
3	2010	2,006
4	2011	2,209
5	2012	574

Table 3.3. Number of spotted seatrout recaptured in the Ellis (2013, 2014) tagging study.

Tag Group	Year	Fleet	n Recaptured
1	2008	Commercial Estuarine	6
1	2008	Recreational	16
1	2009	Commercial Estuarine	13
1	2009	Recreational	31
1	2010	Recreational	1
2	2009	Commercial Estuarine	23
2	2009	Commercial Ocean	1
2	2009	Recreational	30
2	2010	Commercial Estuarine	3
2	2010	Recreational	13
2	2011	Recreational	1
3	2010	Commercial Estuarine	11
3	2010	Recreational	62
3	2011	Commercial Estuarine	4
3	2011	Commercial Ocean	3
3	2011	Recreational	9
3	2012	Commercial Estuarine	1
3	2012	Recreational	1
4	2011	Commercial Estuarine	29
4	2011	Recreational	105
4	2012	Commercial Estuarine	25
4	2012	Commercial Ocean	3
4	2012	Recreational	89
5	2012	Commercial Estuarine	12
5	2012	Commercial Ocean	1
5	2012	Recreational	36

Table 3.4. Summary of spotted seatrout fisheries and survey data used in the base run of the assessment model.

	Removals	Index	Length	Age
Commercial Estuarine Fishery				
Landings	1991–2012		1991–2012	1991–2012
Discards	1994–2012		1992–2012	
Commercial Ocean Fishery				
Landings	1991–2012		1992–2012	1991–2012
Discards	1994–2012		1991–2009	
Recreational Fishery				
Landings	1991–2012		1991–2012	2004–2012
Discards	1991–2012			
Program 120				
Age-0 Abundance		2004–2012		
Program 915				
Abundance--Spring		2003–2012	2003–2012	2001–2012
Abundance--Summer		2003–2012	2003–2012	2001–2012
Abundance--Fall		2003–2012	2003–2012	2001–2012
Abundance--Southern		2008–2012	2008–2012	2008–2012

Table 3.5. Annual predicted recruitment, SSB, and fishing mortality (numbers-weighted, ages 1–4) from the base run of the assessment model.

Year	Age-0 Recruits (000s of fish)	SSB (mt)	<i>F</i>
1991	3,742	885	0.401
1992	3,349	983	0.278
1993	1,879	1,096	0.263
1994	1,688	1,105	0.400
1995	3,073	933	0.490
1996	3,135	829	0.139
1997	2,635	974	0.225
1998	1,440	1,037	0.255
1999	1,750	998	0.638
2000	1,904	710	0.368
2001	2,114	635	0.153
2002	3,872	717	0.207
2003	2,876	868	0.141
2004	5,089	1,063	0.147
2005	3,392	1,315	0.152
2006	4,041	1,504	0.229
2007	2,652	1,564	0.282
2008	1,891	1,450	0.304
2009	3,119	1,257	0.347
2010	3,640	1,108	0.134
2011	1,039	1,223	0.214
2012	902	1,140	0.401

Table 3.6. Predicted numbers (thousands) of females at age at the beginning of the year from the base run of the assessment model.

Biological Year	Age									
	0	1	2	3	4	5	6	7	8	9
1991	1,871	805	456	46	11	6	5	15	9	16
1992	1,675	791	301	207	24	6	4	3	9	16
1993	939	710	336	149	114	14	4	2	2	16
1994	844	399	305	168	83	67	8	2	1	11
1995	1,537	357	146	133	83	44	37	5	1	7
1996	1,567	648	115	59	63	43	24	21	3	5
1997	1,318	667	323	64	35	39	28	16	14	5
1998	720	560	304	166	36	20	24	17	10	12
1999	875	306	244	152	91	21	12	14	10	13
2000	952	368	84	84	62	42	10	6	7	12
2001	1,057	403	143	37	41	32	22	5	3	11
2002	1,936	450	198	78	22	25	20	14	4	9
2003	1,438	824	208	104	45	13	16	13	9	8
2004	2,545	612	411	115	61	28	8	10	8	11
2005	1,696	1,083	304	226	68	37	17	5	6	13
2006	2,021	722	535	166	131	41	23	11	3	12
2007	1,326	859	326	273	92	76	24	14	7	10
2008	946	563	367	157	142	50	43	14	8	9
2009	1,560	401	234	173	81	77	28	24	8	10
2010	1,820	662	159	106	86	43	42	16	14	10
2011	519	775	332	88	63	53	27	27	10	16
2012	451	221	360	170	48	35	31	16	16	15

Table 3.7. Predicted numbers (thousands) of males at age at the beginning of the year from the base run of the assessment model.

Biological Year	Age									
	0	1	2	3	4	5	6	7	8	9
1991	1,871	777	435	40	9	4	3	9	5	8
1992	1,675	766	287	174	18	4	2	2	5	7
1993	939	686	320	130	86	10	2	1	1	7
1994	844	385	290	146	65	46	5	1	1	5
1995	1,537	346	140	113	63	30	22	3	1	3
1996	1,567	628	111	49	45	28	14	11	1	2
1997	1,318	644	305	59	27	26	17	9	7	2
1998	720	541	288	147	30	15	15	9	5	5
1999	875	295	233	133	73	16	8	8	5	6
2000	952	357	84	68	45	27	6	3	4	5
2001	1,057	390	138	34	30	21	13	3	2	5
2002	1,936	434	187	71	19	17	12	8	2	4
2003	1,438	795	198	91	37	10	10	7	5	4
2004	2,545	590	386	104	51	22	6	6	4	5
2005	1,696	1,045	286	202	57	29	13	4	4	6
2006	2,021	696	504	148	111	33	17	8	2	6
2007	1,326	829	310	239	76	59	18	10	4	5
2008	946	544	351	139	115	38	31	10	5	5
2009	1,560	388	225	154	66	57	20	16	5	6
2010	1,820	639	154	93	69	31	28	10	8	6
2011	519	747	313	81	52	40	19	17	6	9
2012	451	213	341	152	42	28	22	10	10	9

Table 3.8. Predicted numbers (thousands) of females at age at mid-year from the base run of the assessment model.

Biological Year	Age									
	0	1	2	3	4	5	6	7	8	9
1991	1,216	492	307	33	8	5	4	12	7	13
1992	1,091	516	212	153	18	5	3	2	7	13
1993	612	465	238	111	87	11	3	2	1	12
1994	549	241	201	118	60	50	6	2	1	8
1995	997	203	93	92	60	33	28	4	1	5
1996	1,023	457	86	46	50	35	19	17	2	4
1997	859	451	231	48	27	30	22	12	11	4
1998	469	370	215	123	27	16	18	13	8	9
1999	568	160	143	97	62	14	9	10	7	10
2000	620	229	56	58	45	30	7	5	5	9
2001	690	283	106	29	32	26	18	4	3	9
2002	1,263	306	143	59	17	20	16	11	3	8
2003	938	582	155	80	35	11	12	10	7	7
2004	1,660	431	305	88	48	22	7	8	7	9
2005	1,107	761	224	172	52	29	14	4	5	10
2006	1,317	485	382	123	100	31	18	8	3	10
2007	864	562	226	197	68	57	18	11	5	7
2008	616	363	252	112	104	37	32	10	6	7
2009	1,016	252	157	122	59	57	21	18	6	8
2010	1,188	469	118	81	68	34	34	13	11	8
2011	339	528	237	65	47	40	21	21	8	12
2012	293	135	235	117	34	26	22	12	12	11

Table 3.9. Predicted numbers (thousands) of males at age at mid-year from the base run of the assessment model.

Biological Year	Age									
	0	1	2	3	4	5	6	7	8	9
1991	1,197	472	275	27	6	3	2	7	4	6
1992	1,072	495	193	123	13	3	2	1	4	6
1993	602	446	216	92	63	7	2	1	1	6
1994	540	232	181	96	44	32	4	1	1	4
1995	982	196	83	71	42	21	16	2	0	2
1996	1,004	438	81	36	34	21	11	9	1	2
1997	844	430	212	42	20	20	13	7	5	2
1998	461	355	196	104	22	11	11	7	4	4
1999	559	157	126	77	45	10	5	5	4	4
2000	609	222	53	46	31	19	5	2	3	4
2001	677	270	99	25	23	16	10	3	1	4
2002	1,240	293	131	52	14	13	9	6	2	3
2003	921	554	143	68	28	8	8	6	4	3
2004	1,630	411	279	77	39	17	5	5	3	4
2005	1,087	725	206	149	43	22	10	3	3	5
2006	1,294	464	347	106	81	24	13	6	2	4
2007	849	539	208	166	54	43	13	7	3	4
2008	605	350	232	96	81	27	22	7	4	4
2009	999	244	145	103	45	40	14	12	4	4
2010	1,166	447	112	70	53	24	22	8	7	5
2011	333	505	218	58	38	30	14	13	5	7
2012	289	131	213	99	28	19	15	7	7	6

9 FIGURES

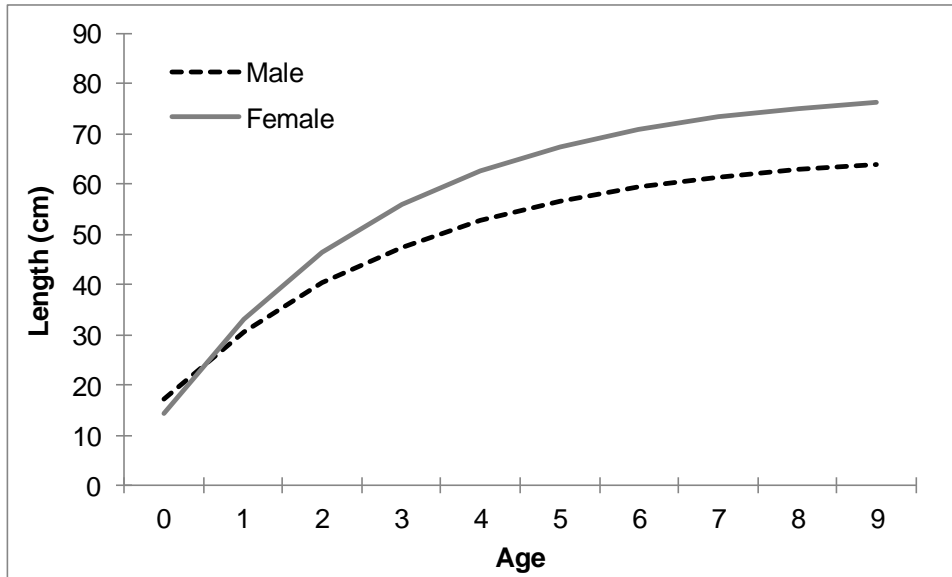


Figure 1.1. Predicted von Bertalanffy age-length relation for spotted seatrout by sex.

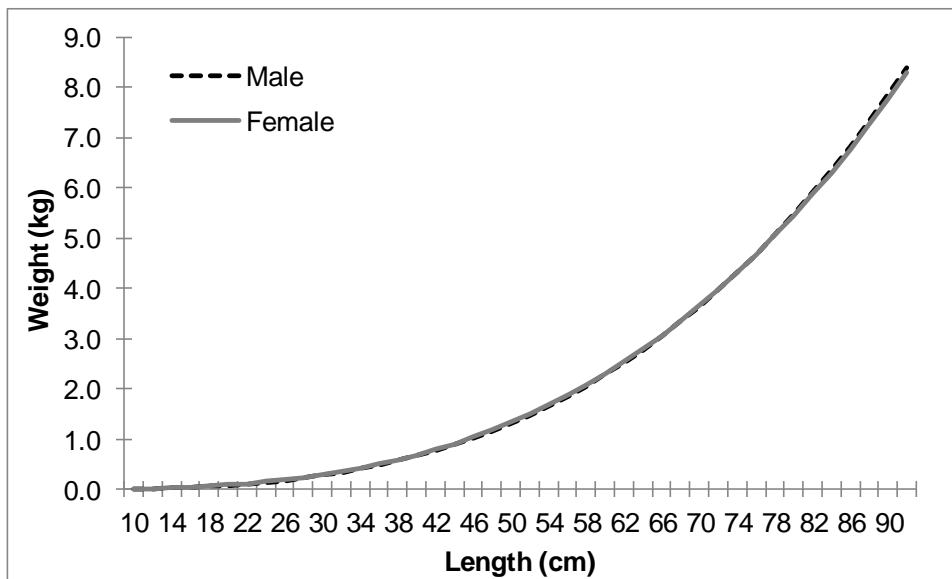


Figure 1.2. Predicted allometric length-weight relation for spotted seatrout by sex.

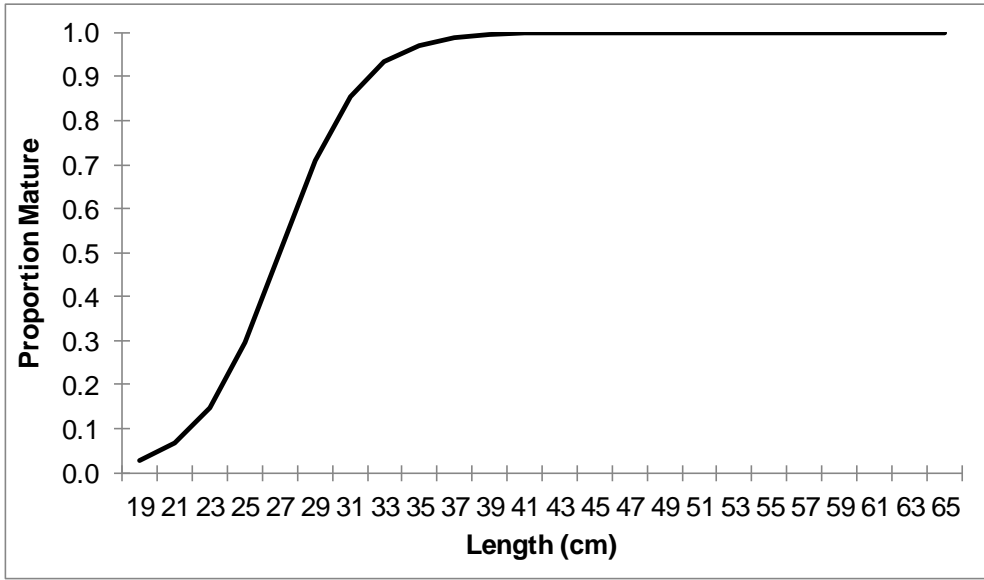


Figure 1.3. Predicted maturity curve for female spotted seatrout collected in North Carolina.

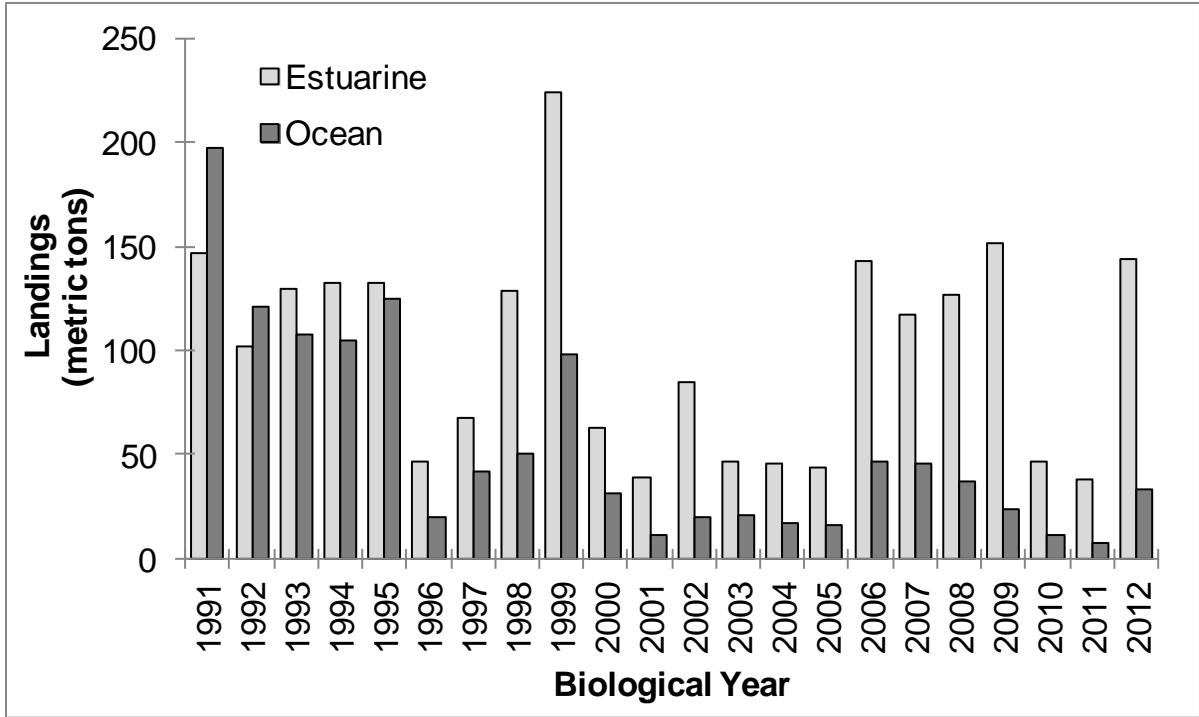


Figure 2.1. Annual commercial fishery landings of spotted seatrout in Virginia and North Carolina by area, 1991–2012.

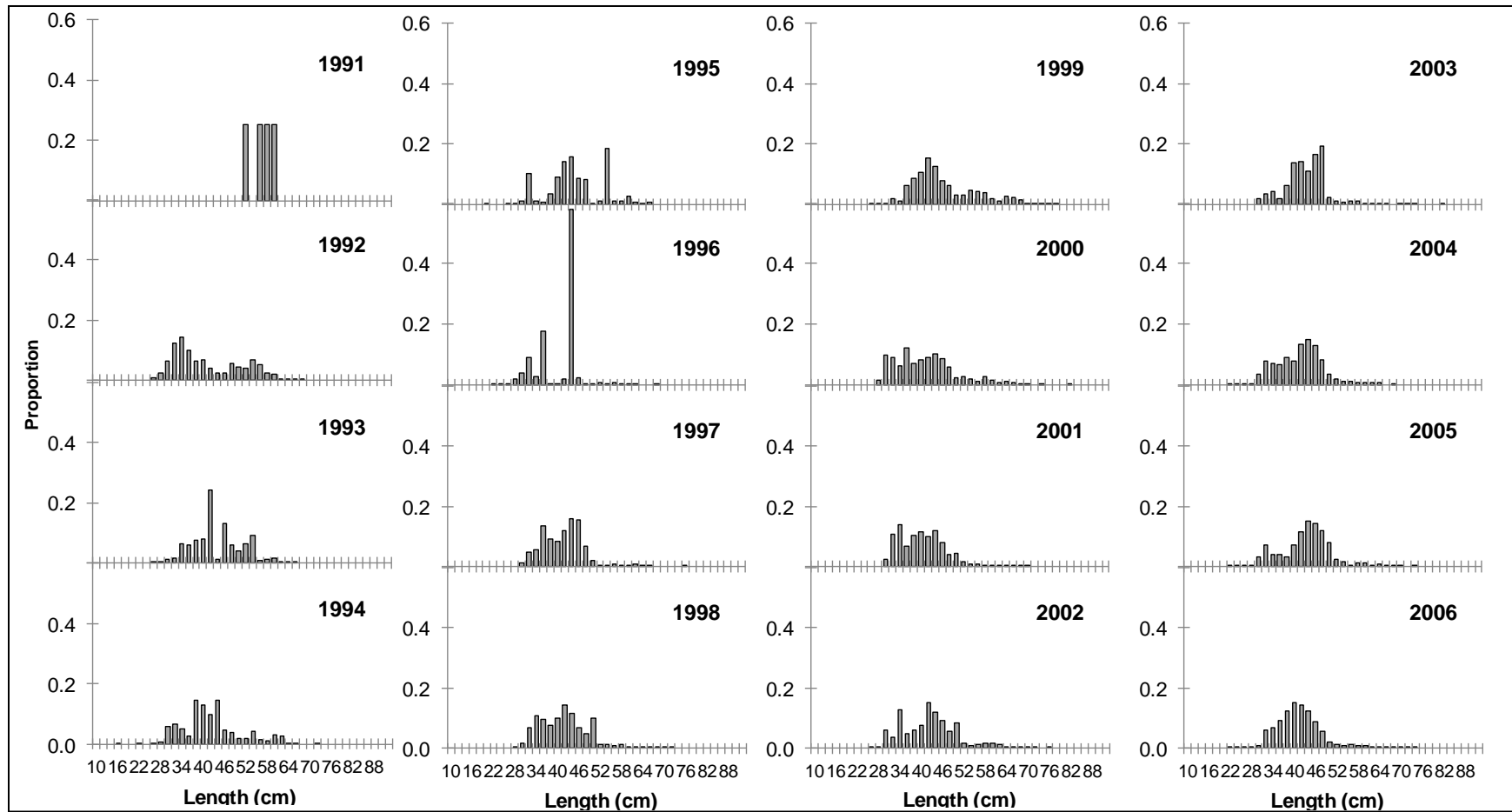


Figure 2.2. Annual length-frequency distributions of spotted seatrout sampled from Virginia and North Carolina commercial estuarine fishery landings, 1991–2006.

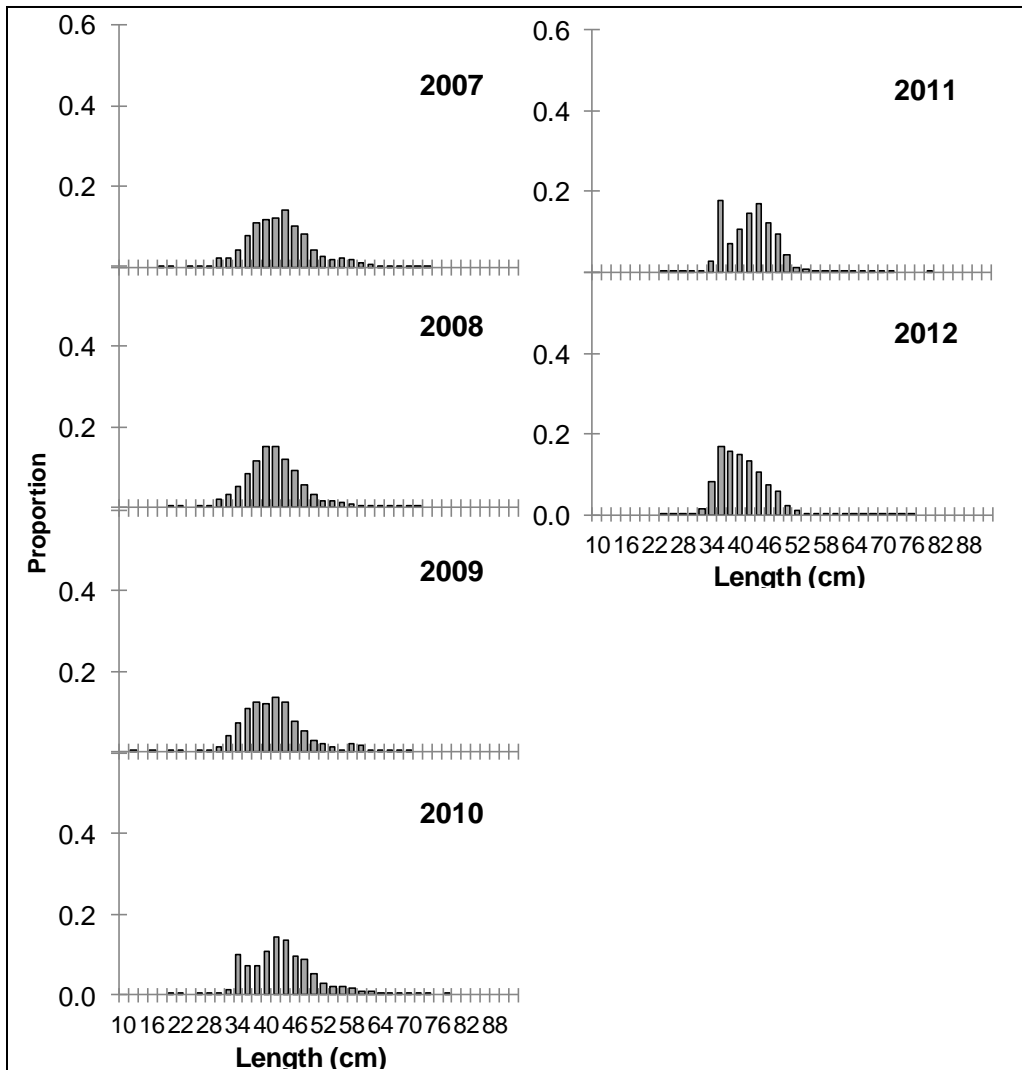


Figure 2.3. Annual length-frequency distributions of spotted seatrout sampled from Virginia and North Carolina commercial estuarine fishery landings, 2007–2012.

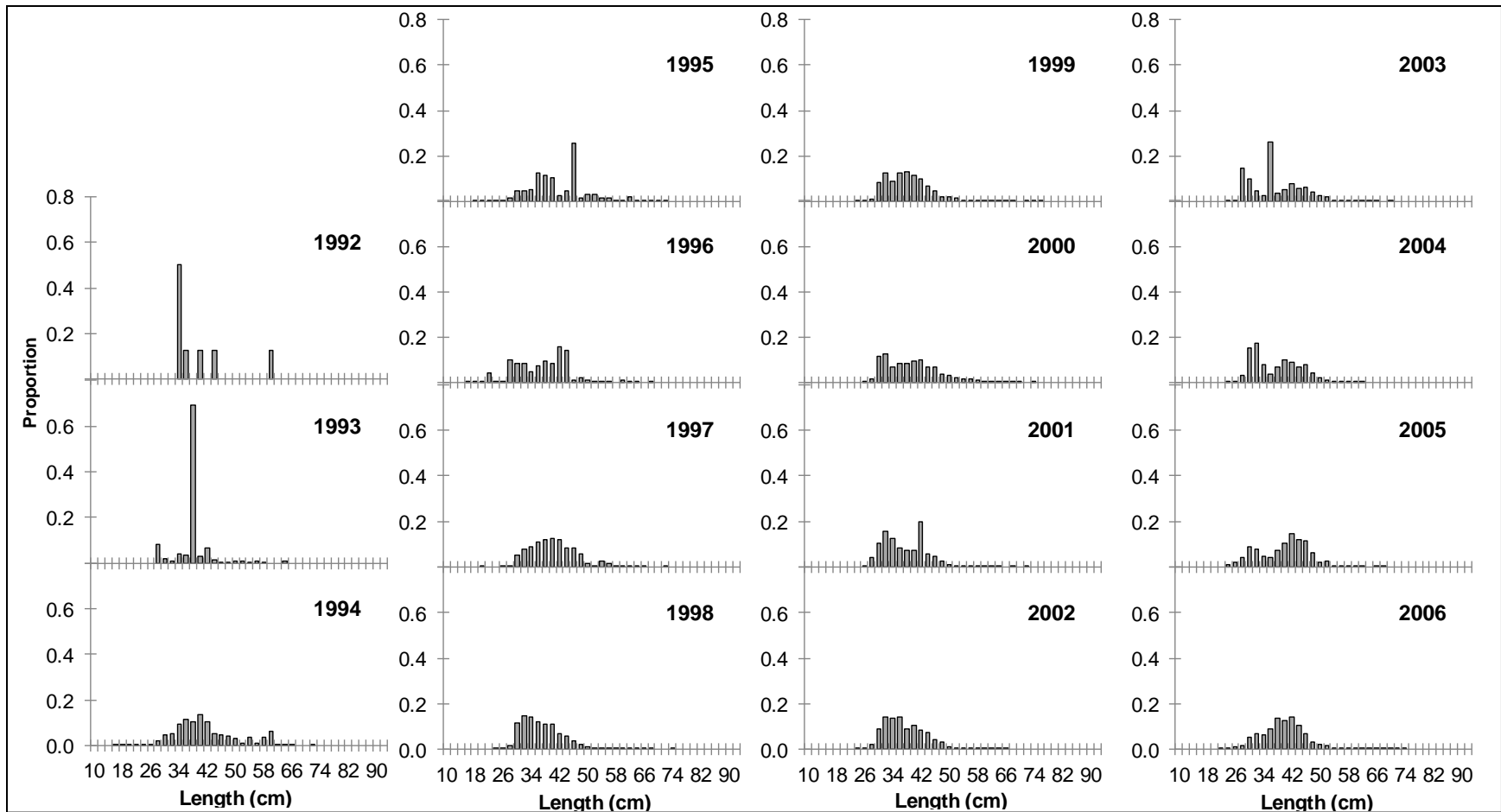


Figure 2.4. Annual length-frequency distributions of spotted seatrout sampled from Virginia and North Carolina commercial ocean fishery landings, 1992–2006. No spotted seatrout were available for sampling from the commercial ocean fishery in 1991.

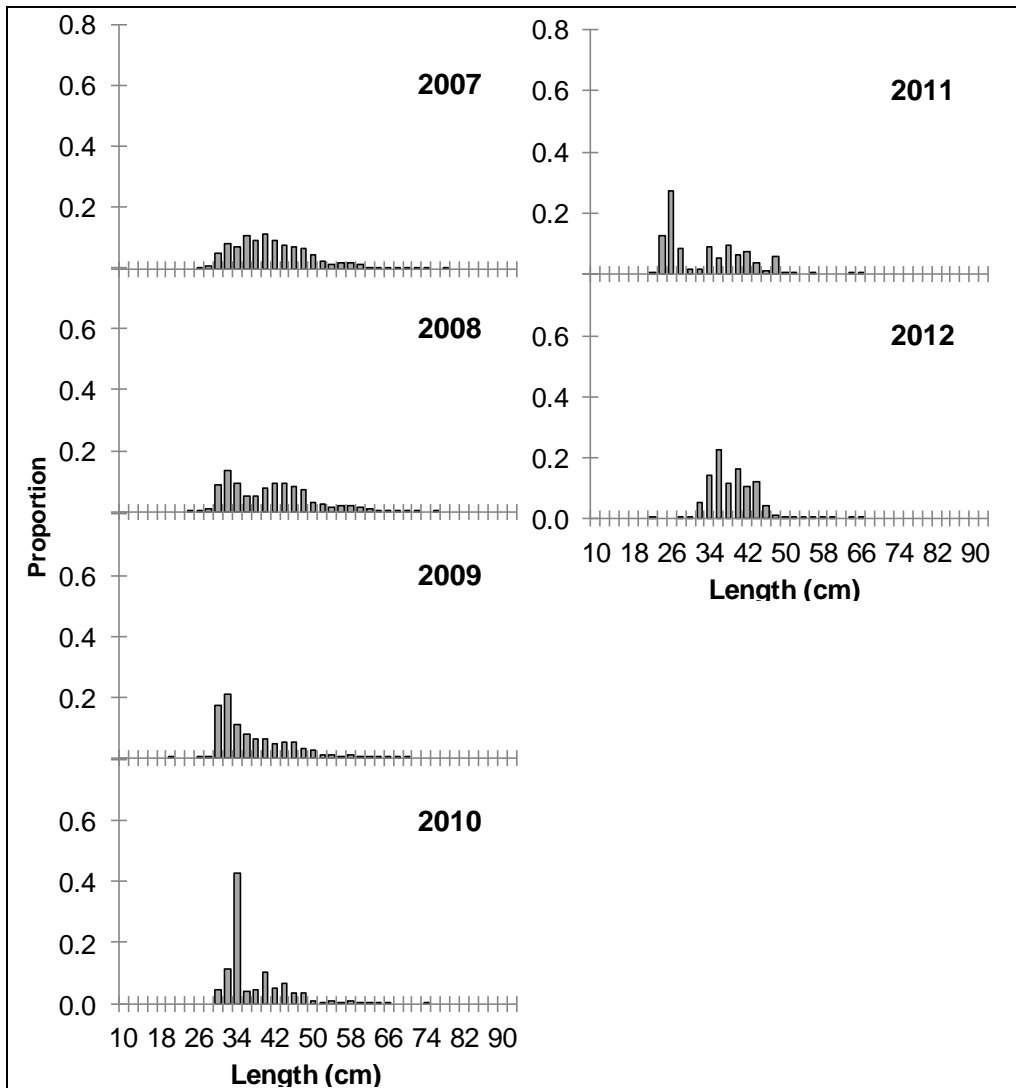


Figure 2.5. Annual length-frequency distributions of spotted seatrout sampled from Virginia and North Carolina commercial ocean fishery landings, 2007–2012.

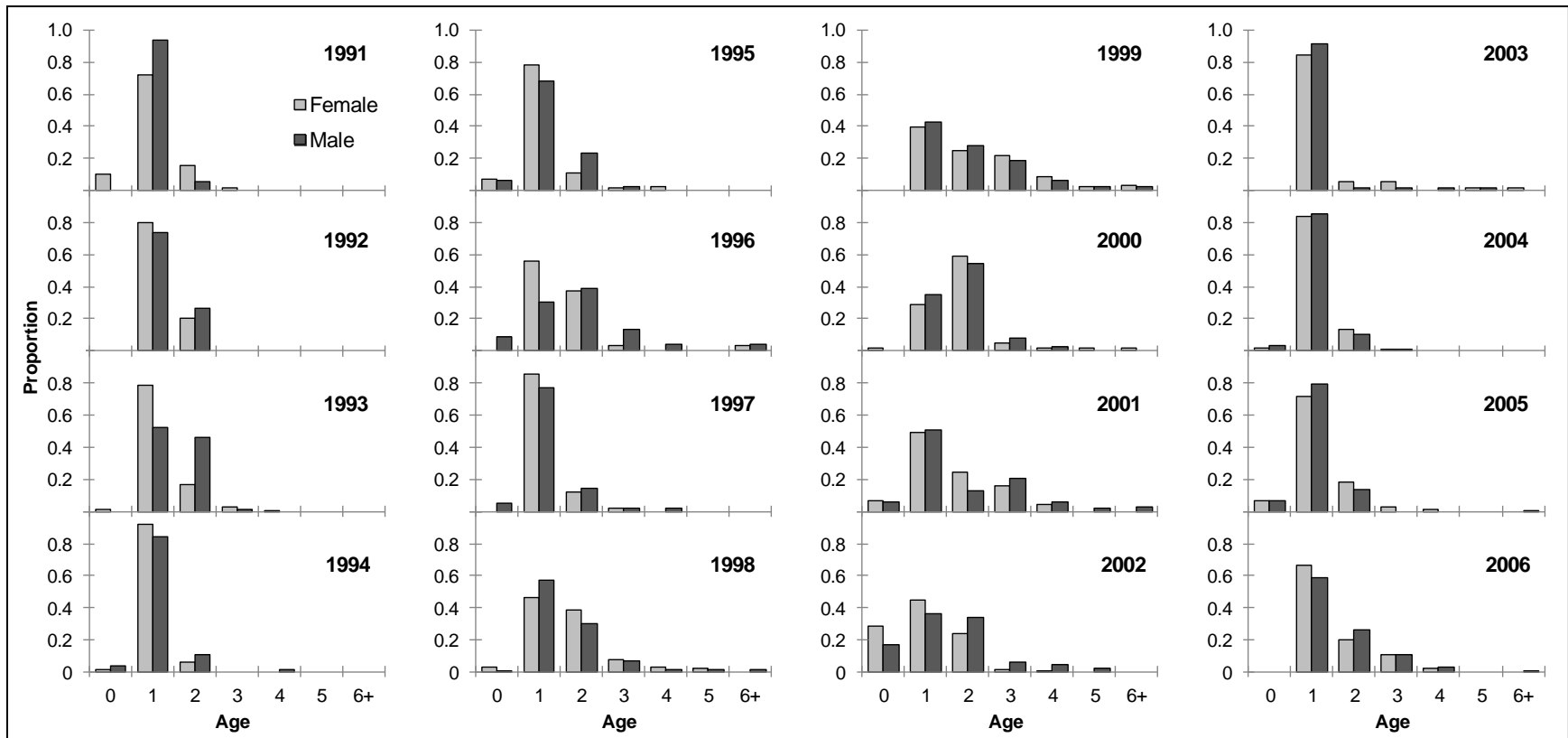


Figure 2.6. Annual age-frequency distributions of spotted seatrout sampled from Virginia and North Carolina commercial estuarine fishery landings by sex, 1991–2006.

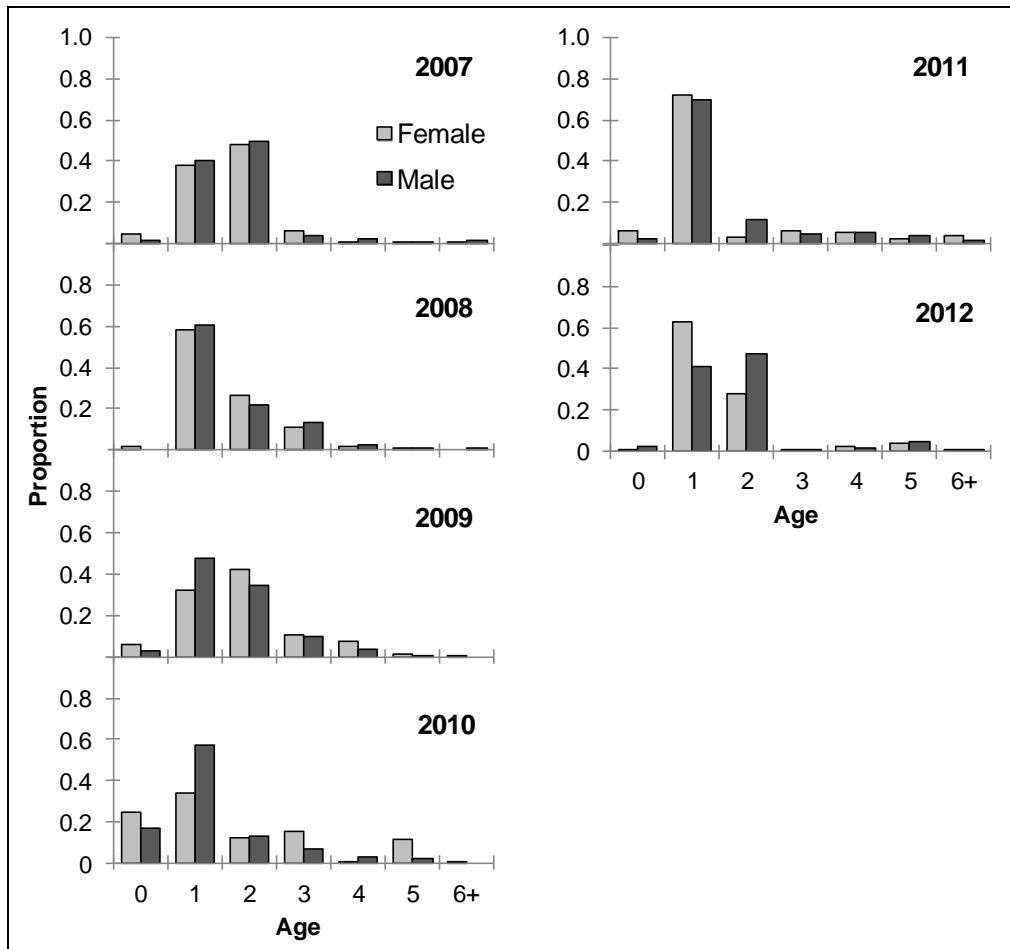


Figure 2.7. Annual age-frequency distributions of spotted seatrout sampled from Virginia and North Carolina commercial estuarine fishery landings by sex, 2007–2012.

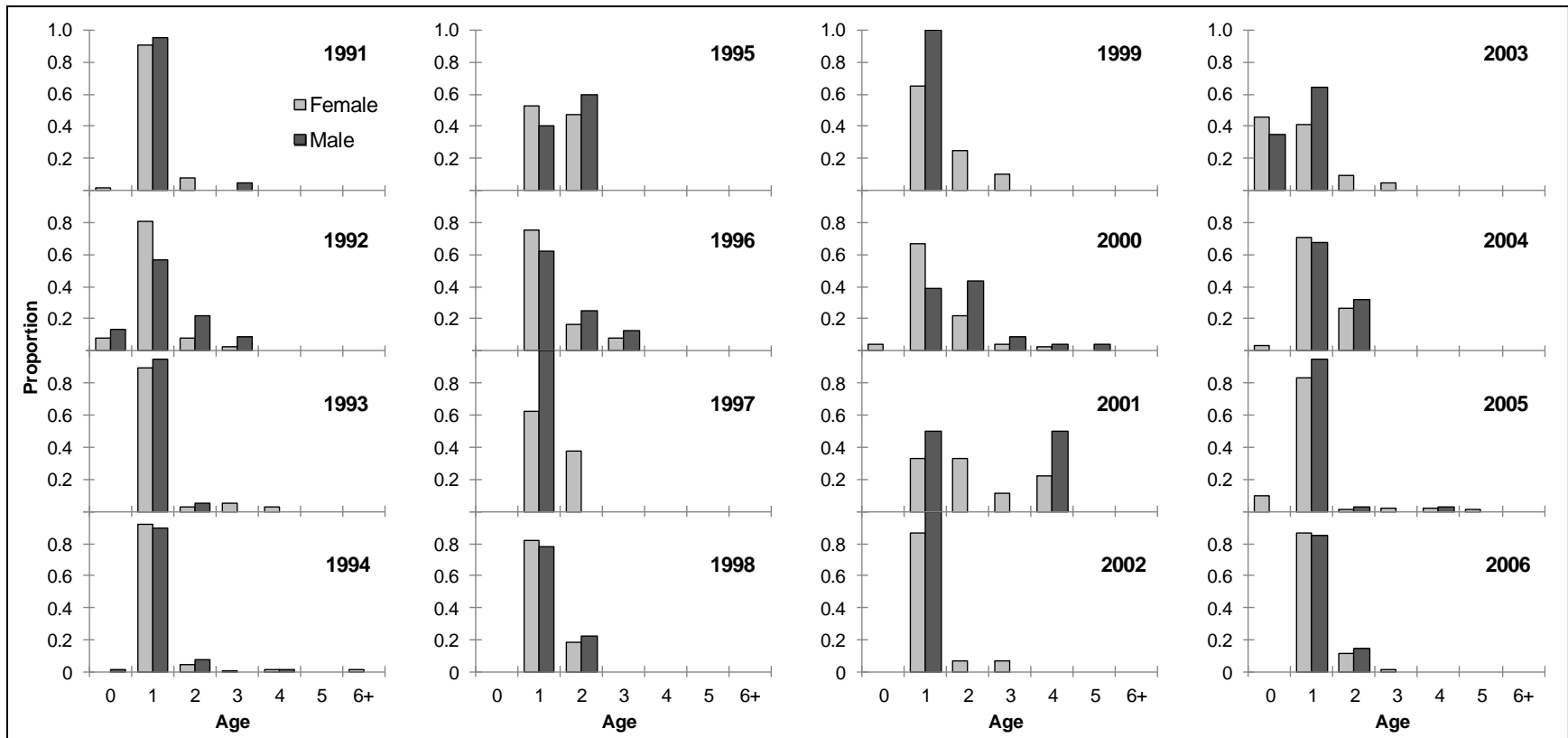


Figure 2.8. Annual age-frequency distributions of spotted seatrout sampled from Virginia and North Carolina commercial ocean fishery landings by sex, 1991–2006.

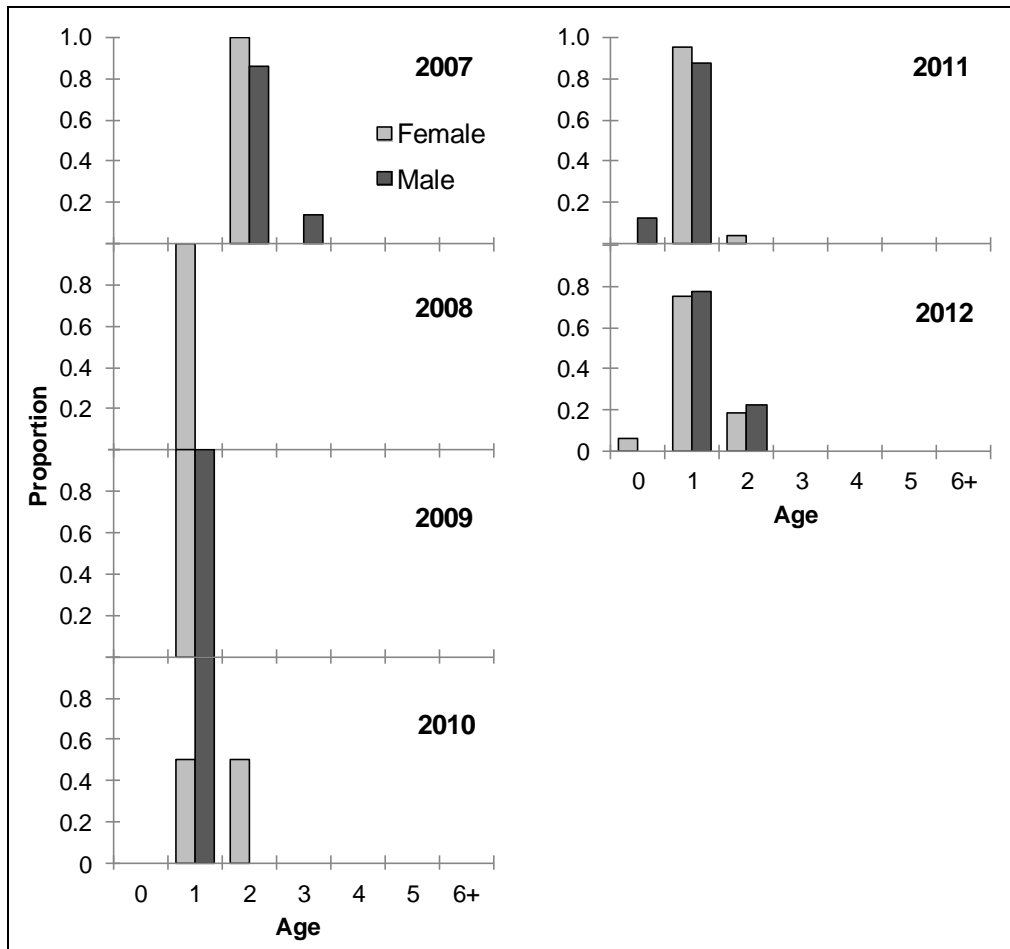


Figure 2.9. Annual age-frequency distributions of spotted seatrout sampled from Virginia and North Carolina commercial ocean fishery landings by sex, 2007–2012.

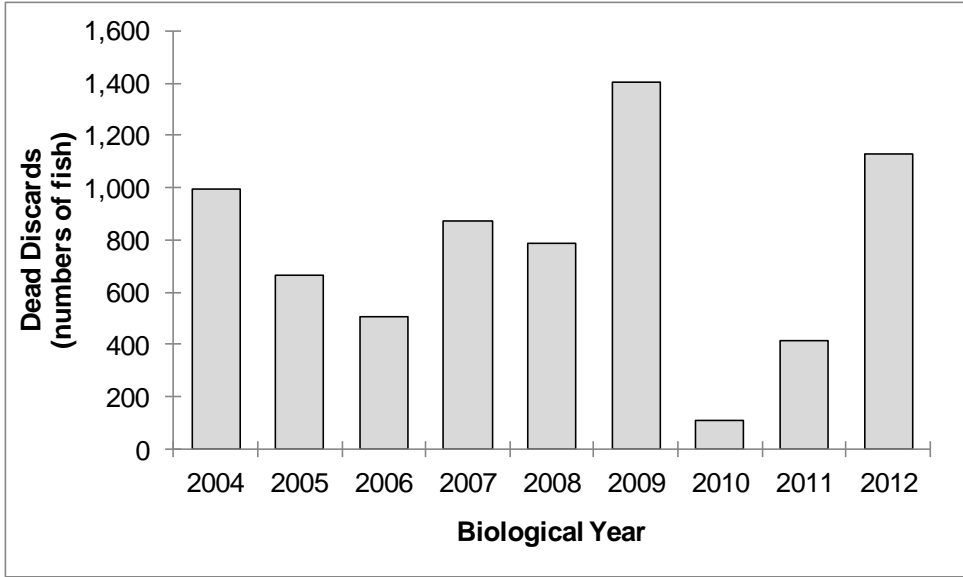


Figure 2.10. Annual commercial gill-net estuarine fishery dead discards of spotted seatrout in North Carolina, 2004–2012.

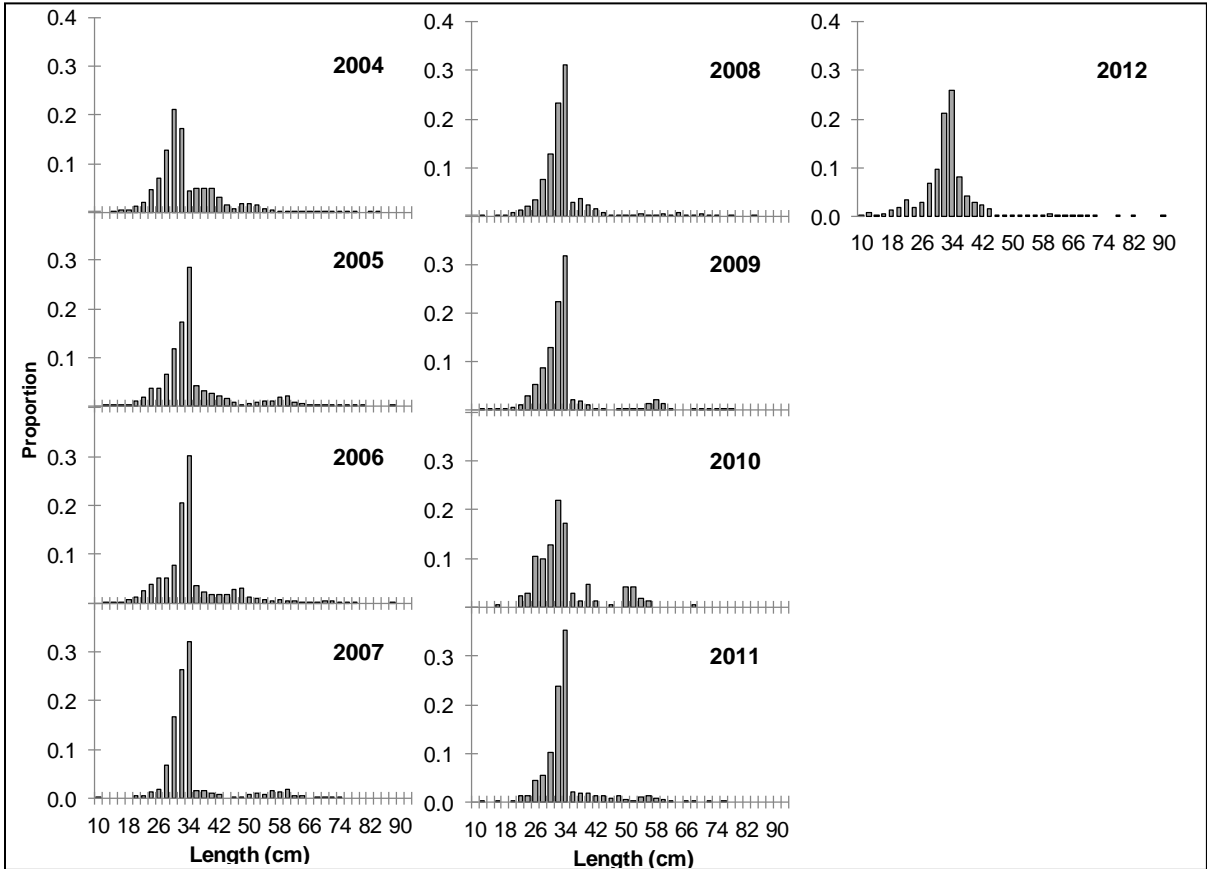


Figure 2.11. Annual length-frequency distributions of spotted seatrout sampled from North Carolina commercial gill-net estuarine fishery discards, 2004–2012.

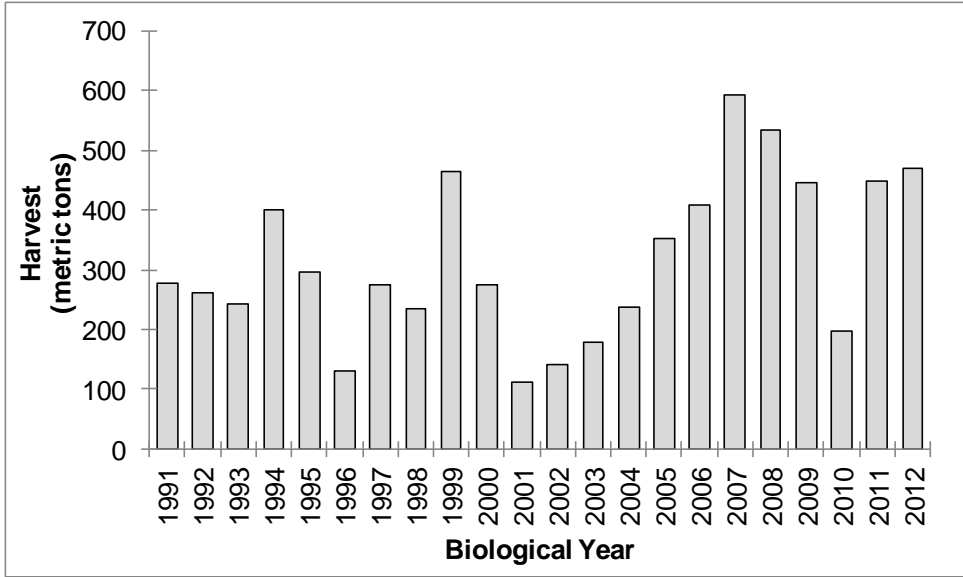


Figure 2.12. Annual recreational fishery harvest (Type A+B1) of spotted seatrout in Virginia and North Carolina, 1991–2012.

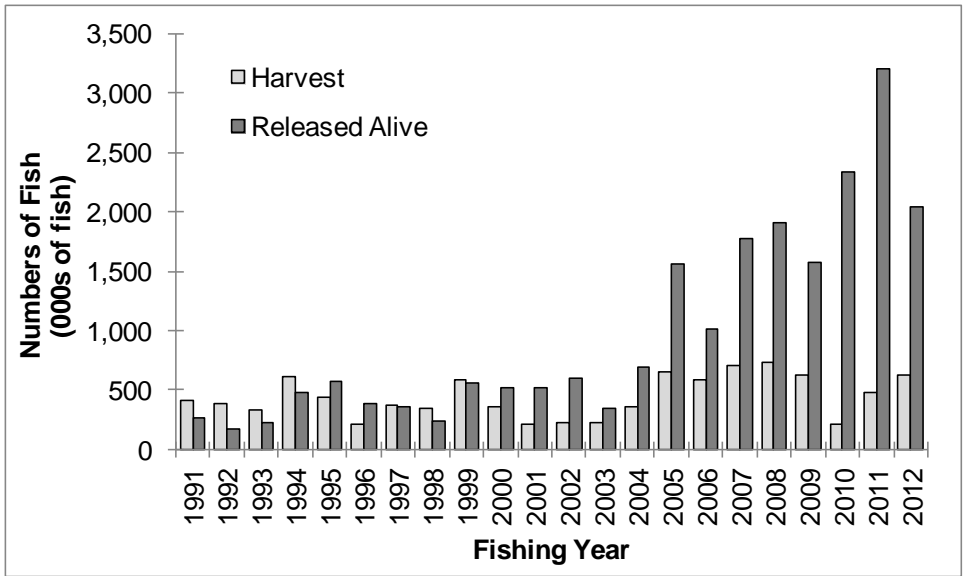


Figure 2.13. Annual recreational fishery harvest (Type A+B1) and live releases (Type B2) of spotted seatrout in Virginia and North Carolina, 1991–2012.

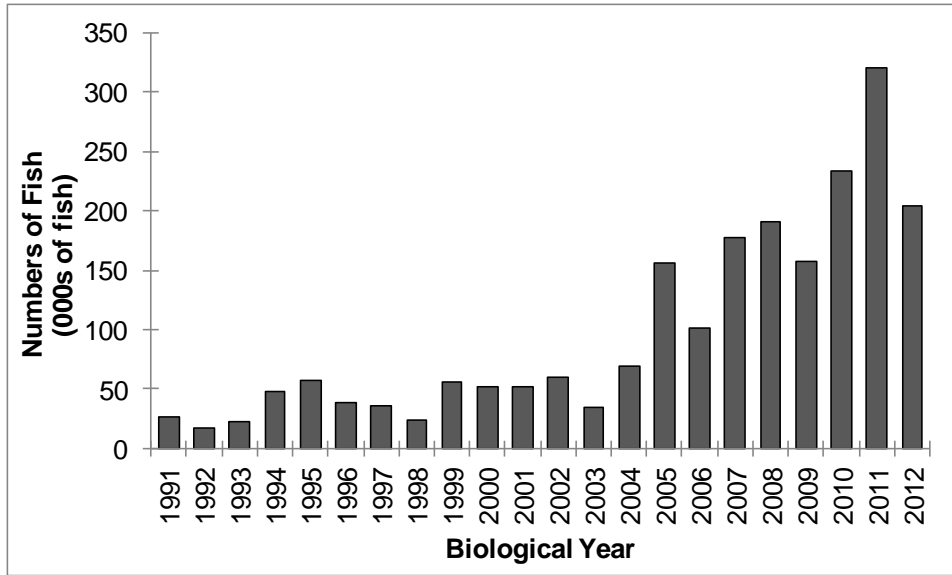


Figure 2.14. Annual recreational fishery dead discards of spotted seatrout in Virginia and North Carolina, 1991–2012.

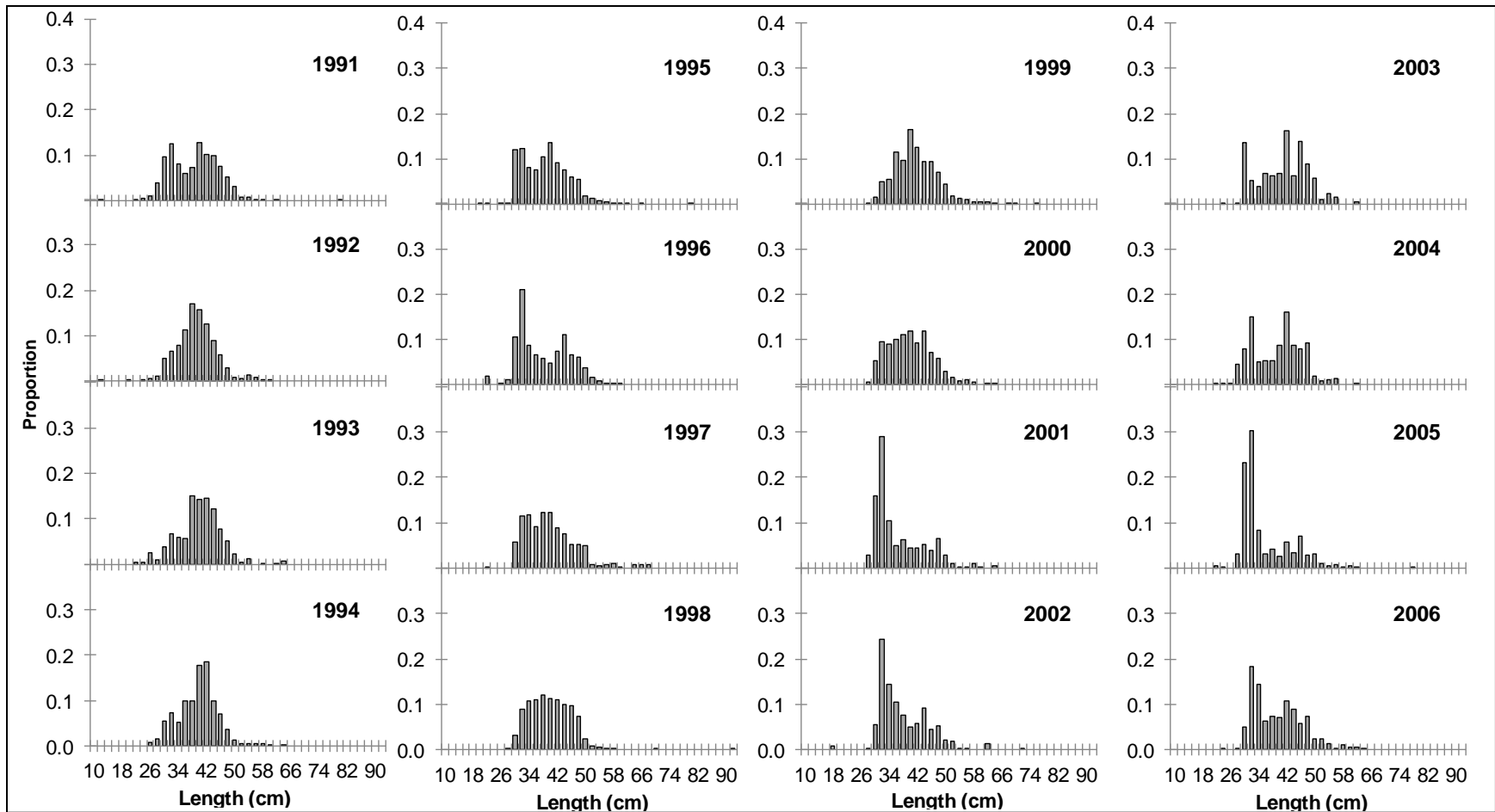


Figure 2.15. Annual length-frequency distributions of spotted seatrout sampled from Virginia and North Carolina recreational fishery landings, 1991–2006.

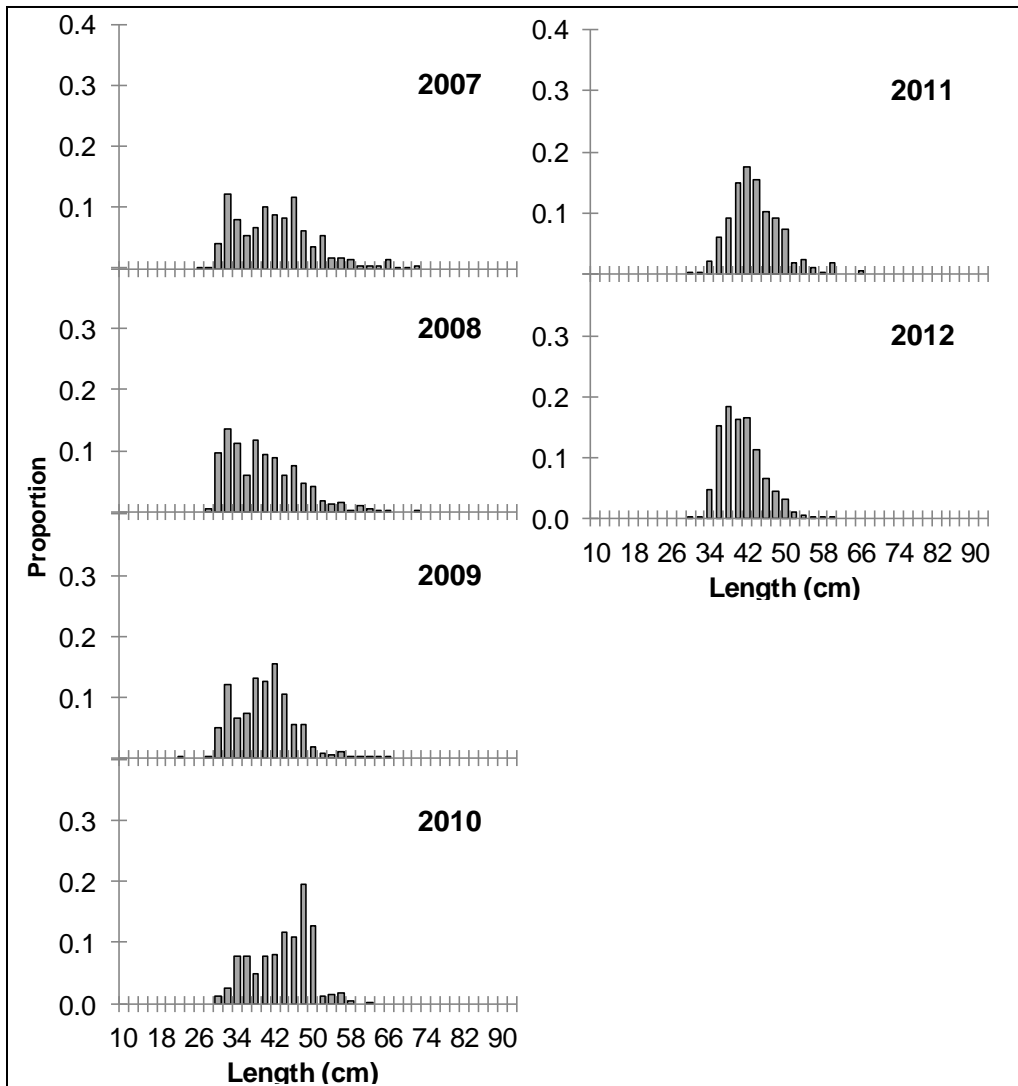


Figure 2.16. Annual length-frequency distributions of spotted seatrout sampled from Virginia and North Carolina recreational fishery landings, 2007–2012.

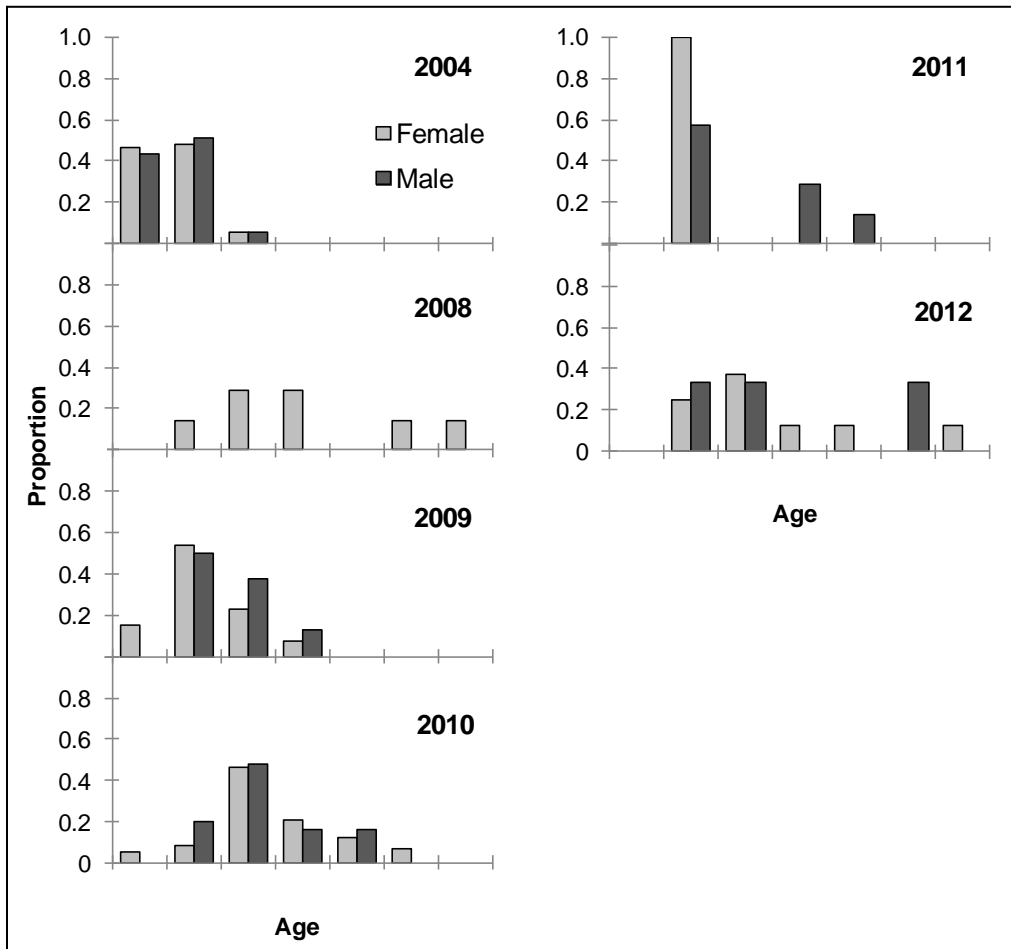


Figure 2.17. Annual age-frequency distributions of spotted seatrout sampled from Virginia's recreational fishery landings by sex, 2004–2012.

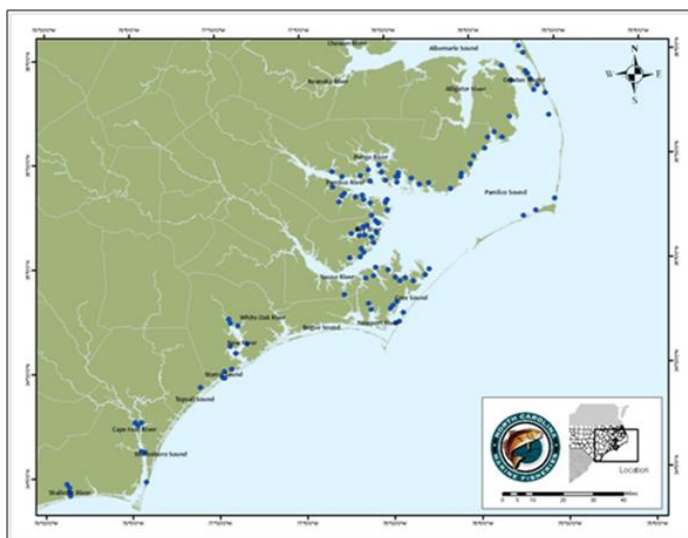


Figure 2.18. Locations of core stations sampled by NCDMF Program 120.

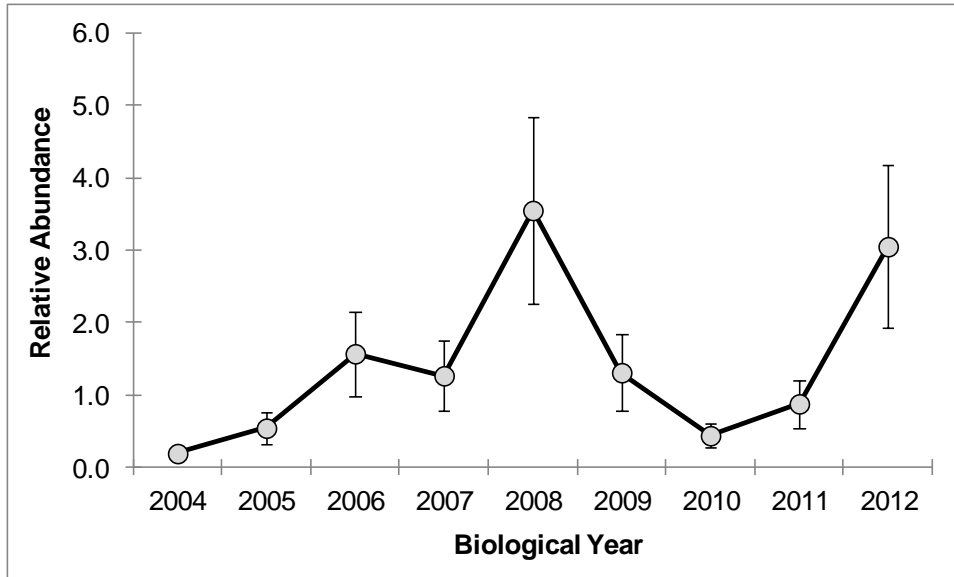


Figure 2.19. GLM-standardized index of relative abundance for age-0 spotted seatrout collected from Program 120 during June and July, 2004–2012. Error bars represent ± 1 standard error.

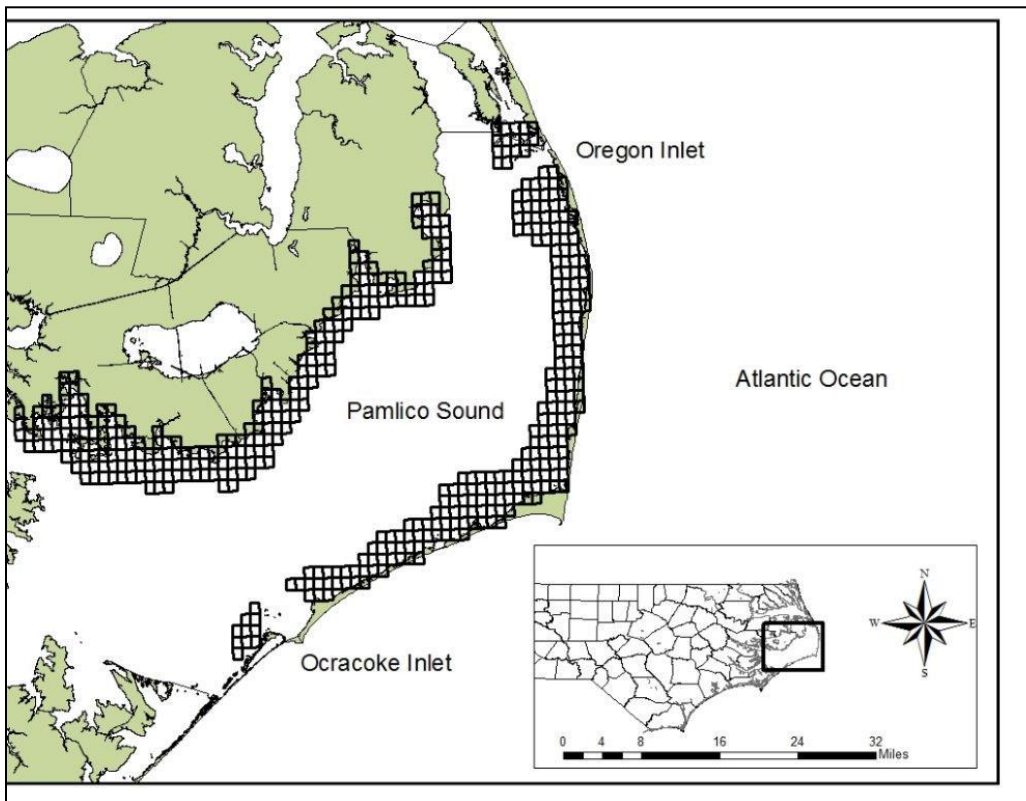


Figure 2.20. The sample regions and grid system for the Pamlico Sound portion of NCDMF Program 915.

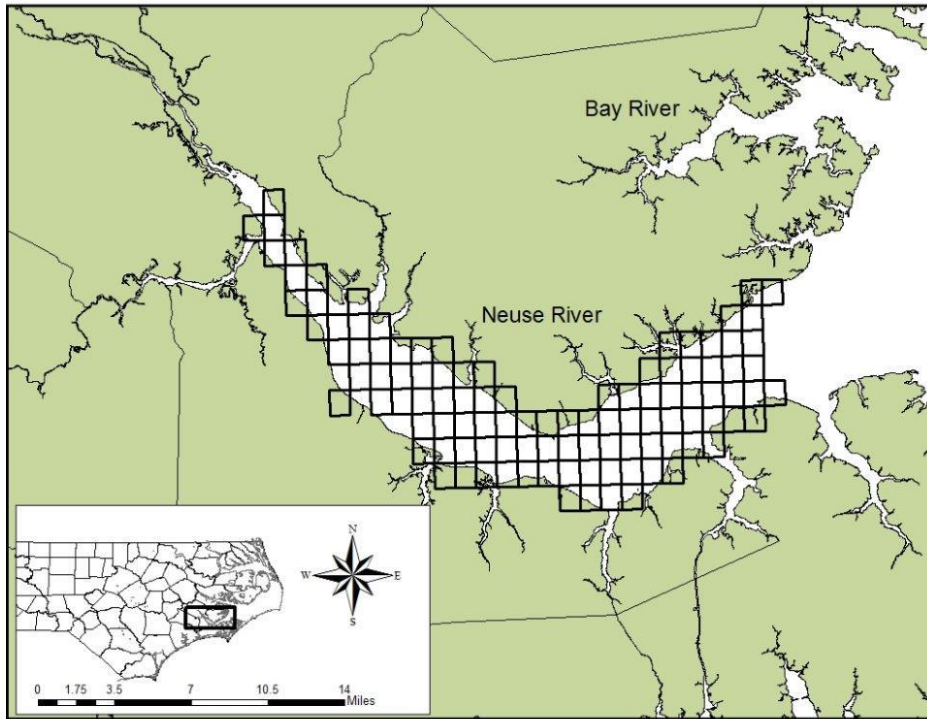


Figure 2.21. The sample regions and grid system for the Neuse River portion of NCDMF Program 915.

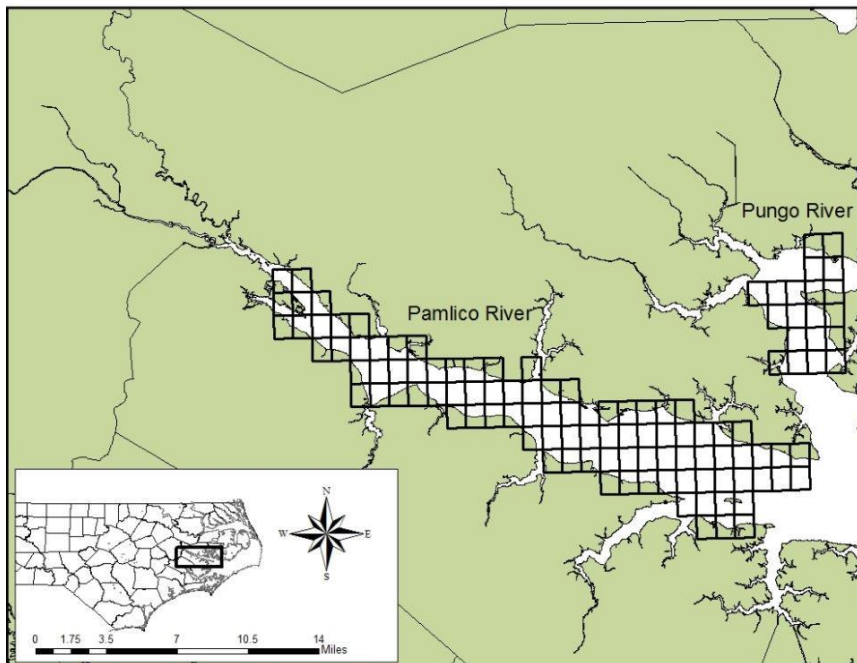


Figure 2.22. The sample regions and grid system for the Pamlico and Pungo river portions of NCDMF Program 915.

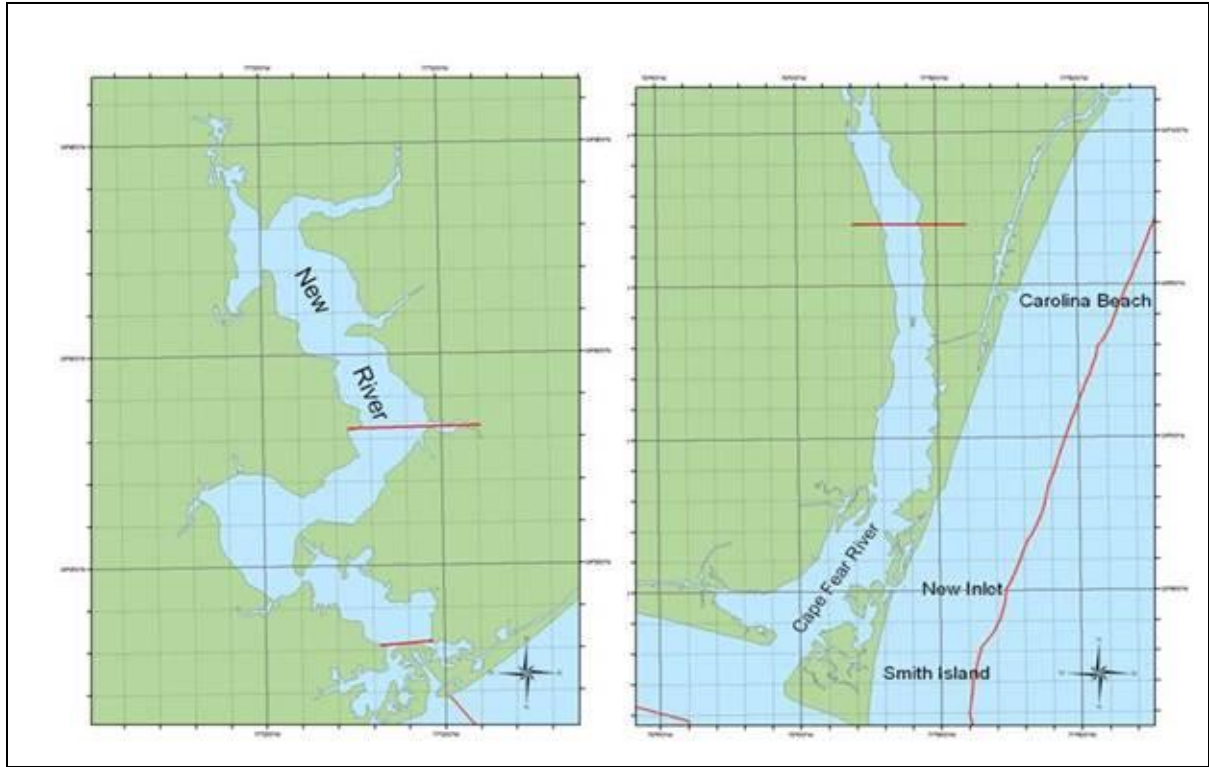


Figure 2.23. The sample regions and grid system for the Southern District portion of NCDMF Program 915.

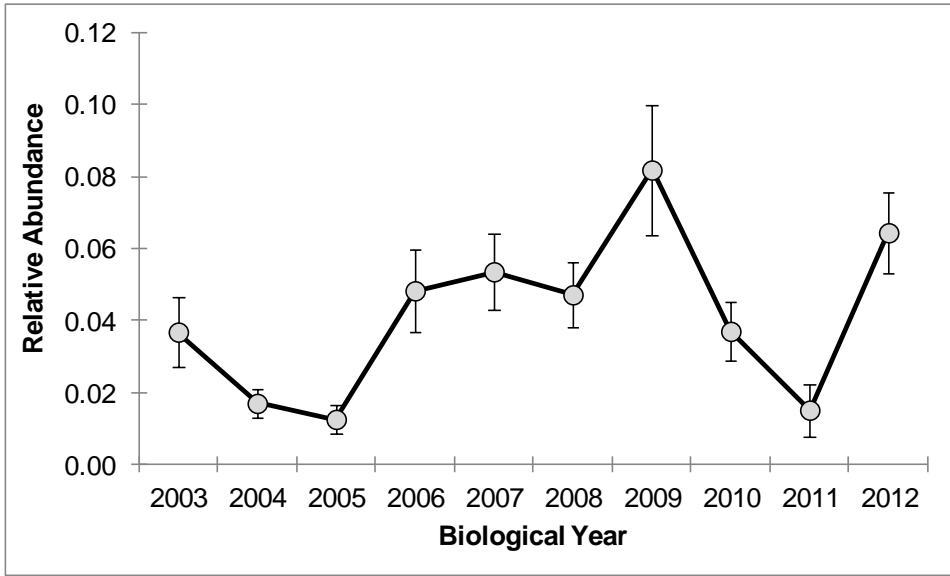


Figure 2.24. GLM-standardized index of relative abundance for spotted seatrout collected from Program 915 during spring (May–June), 2003–2012. Error bars represent ± 1 standard error.

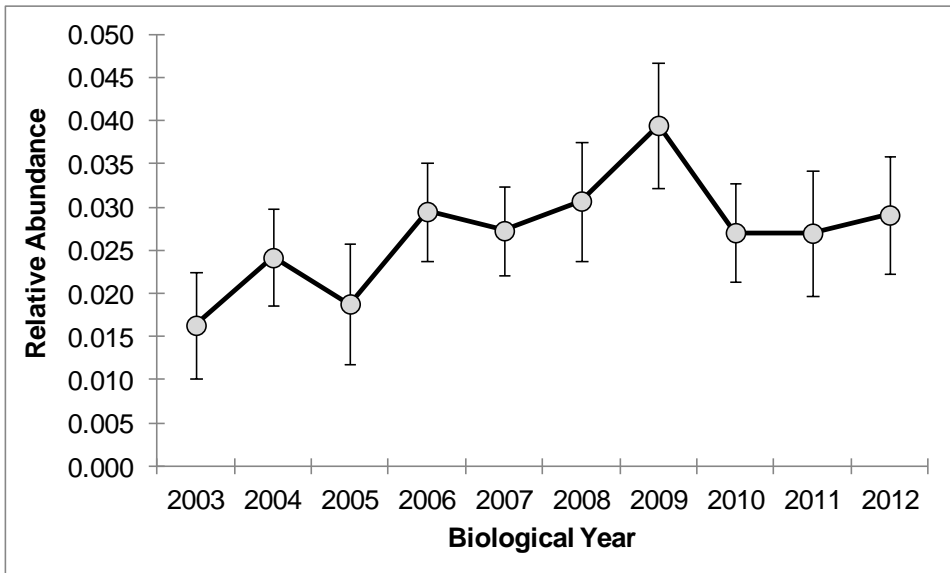


Figure 2.25. GLM-standardized index of relative abundance for spotted seatrout collected from Program 915 during summer (July–August), 2003–2012. Error bars represent ± 1 standard error.

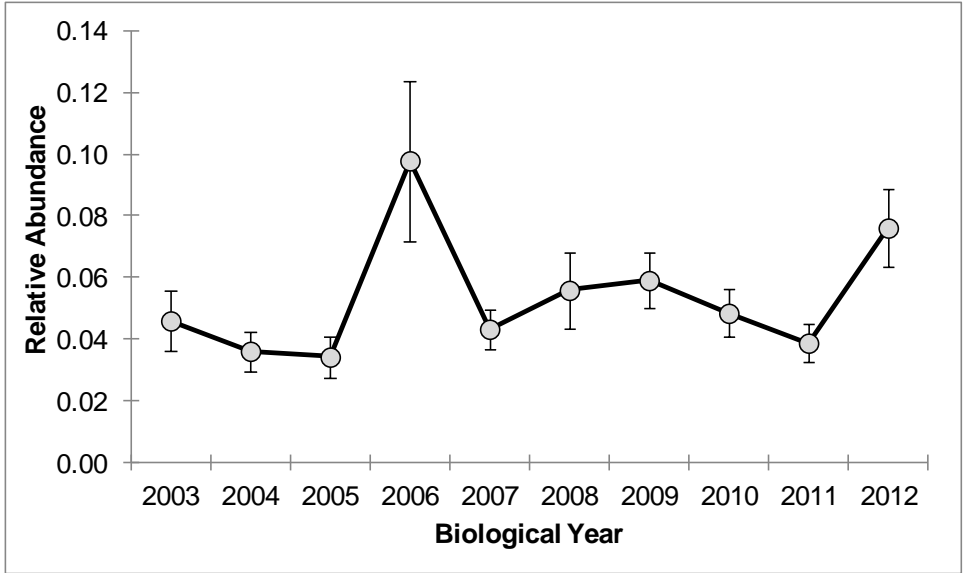


Figure 2.26. GLM-standardized index of relative abundance for spotted seatrout collected from Program 915 during fall (September–November), 2003–2012. Error bars represent ± 1 standard error.

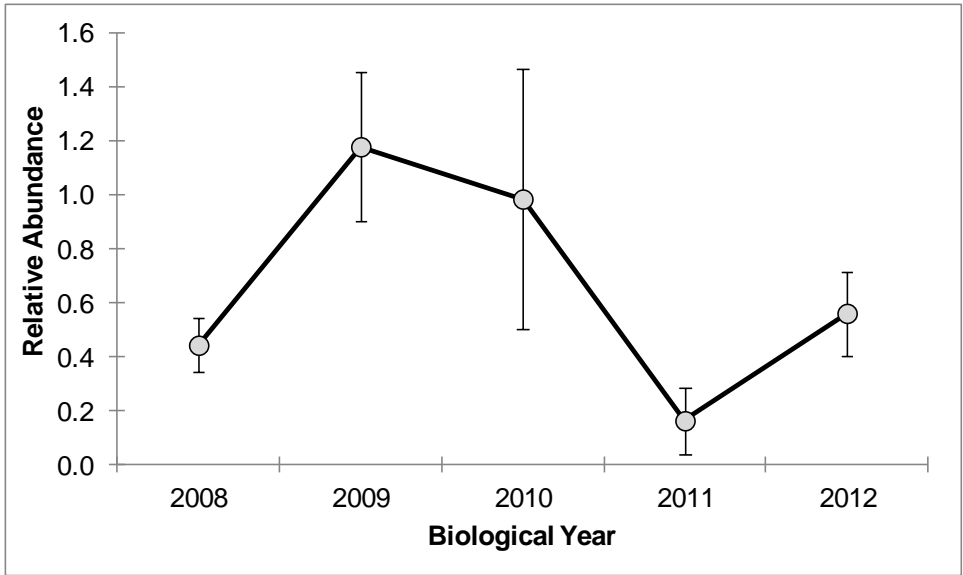


Figure 2.27. GLM-standardized index of relative abundance for spotted seatrout collected from Program 915 during spring (May–June) in the southern sampling stations, 2008–2012. Error bars represent ± 1 standard error.

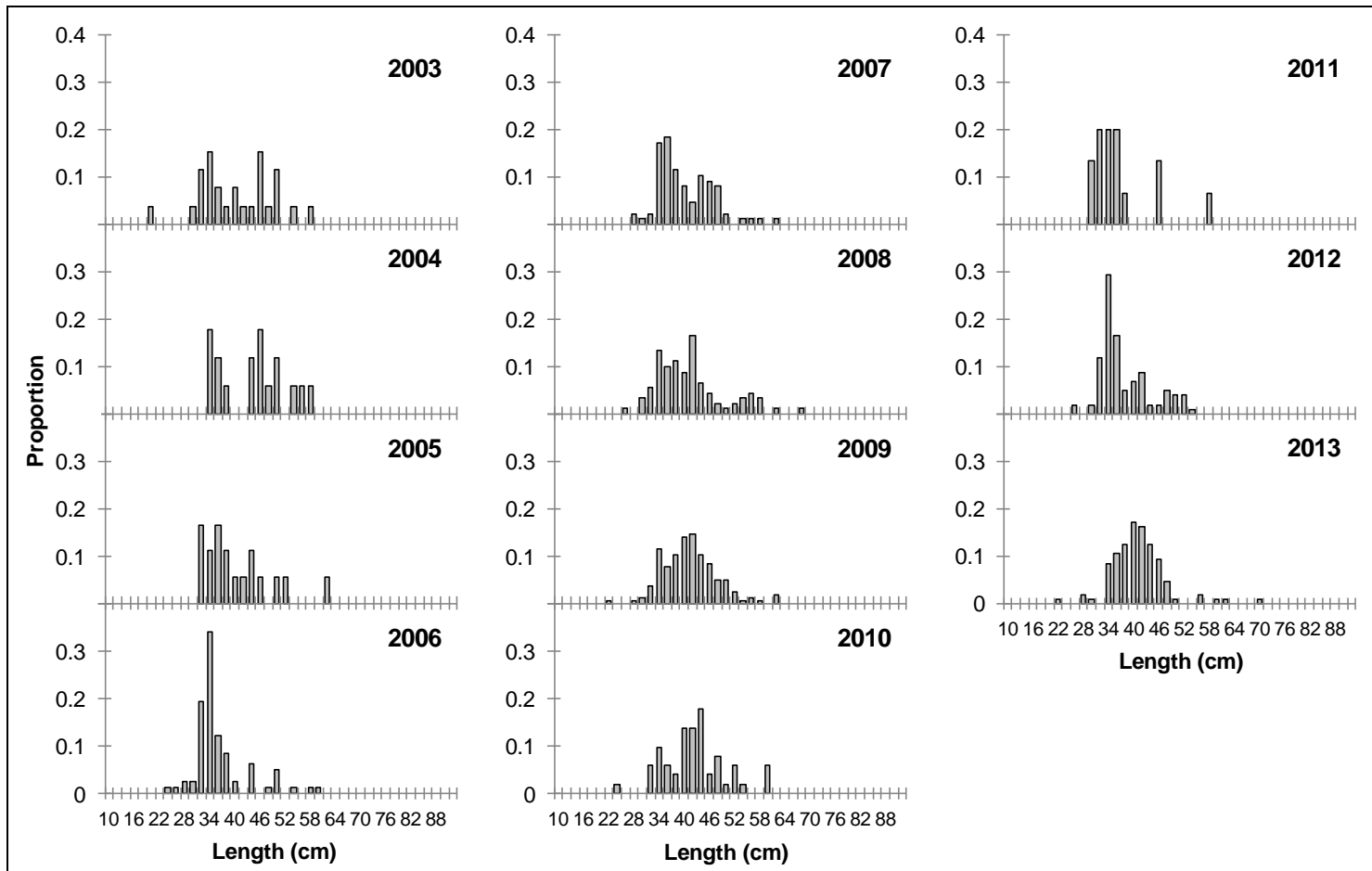


Figure 2.28. Annual length-frequency distributions of spotted seatrout collected by NCDMF Program 915 during spring (May–June), 2003–2012.

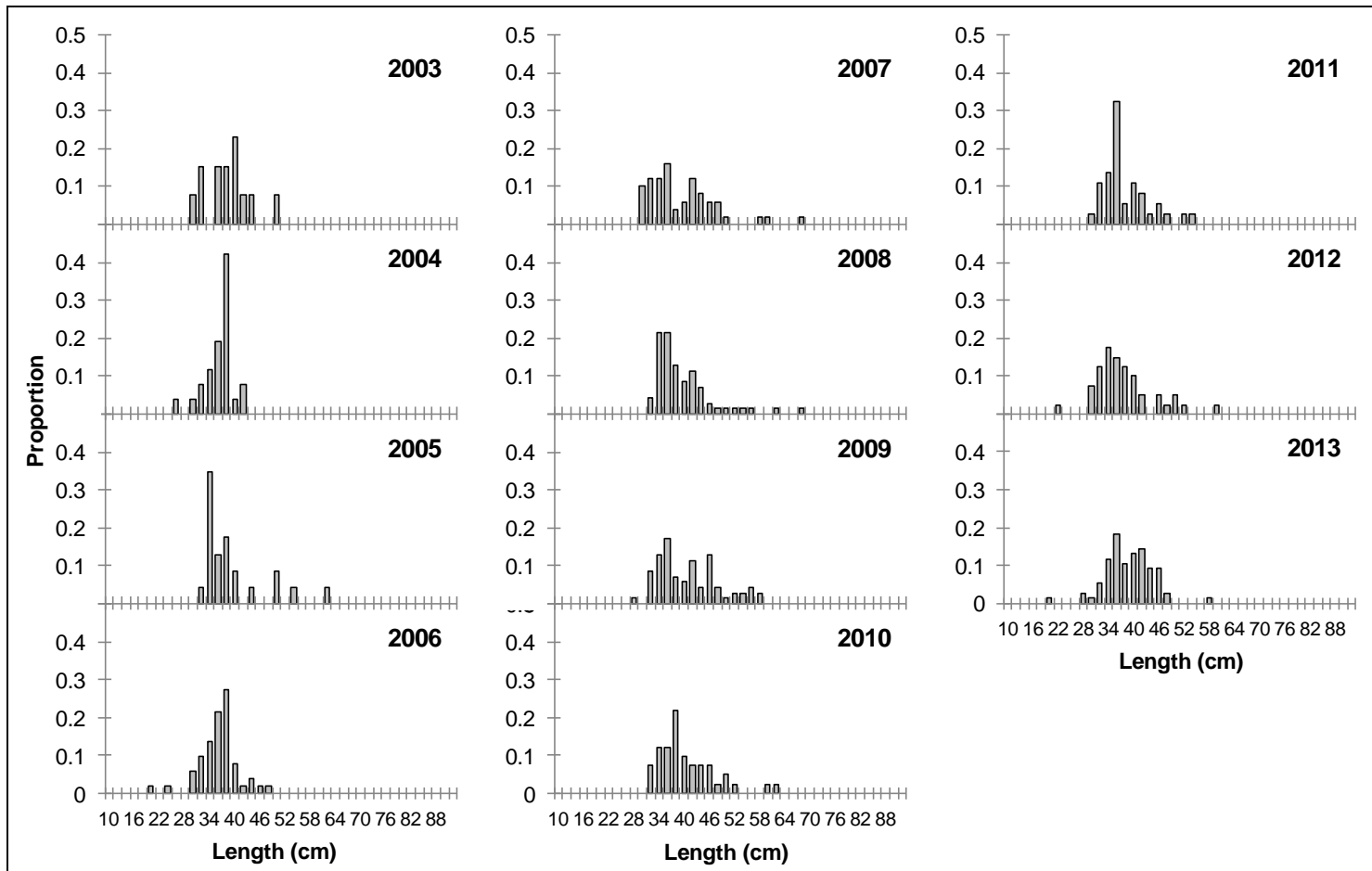


Figure 2.29. Annual length-frequency distributions of spotted seatrout collected by NCDMF Program 915 during summer (July–August), 2003–2012.

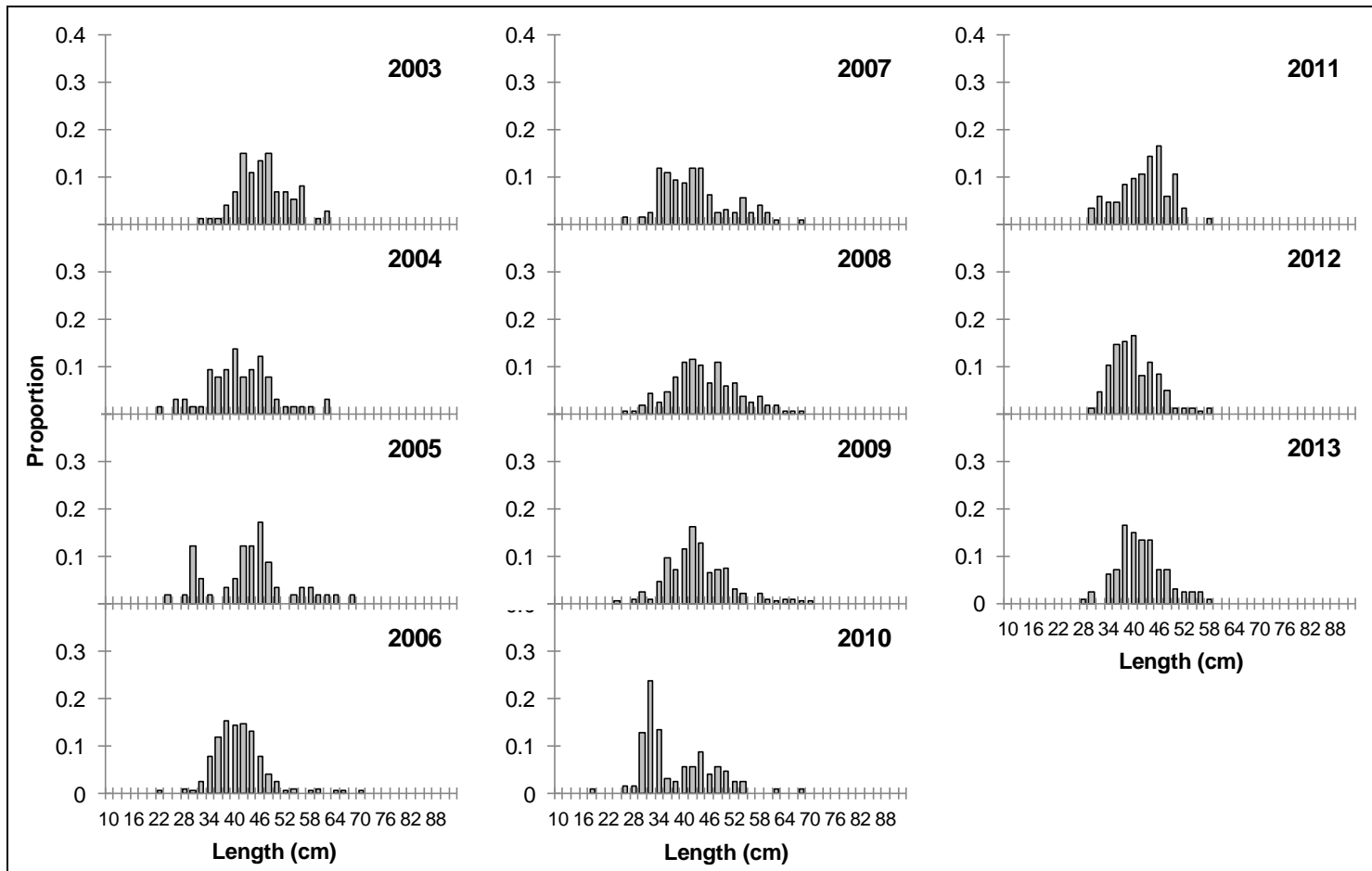


Figure 2.30. Annual length-frequency distributions of spotted seatrout collected by NCDMF Program 915 during fall (September–November), 2003–2012.

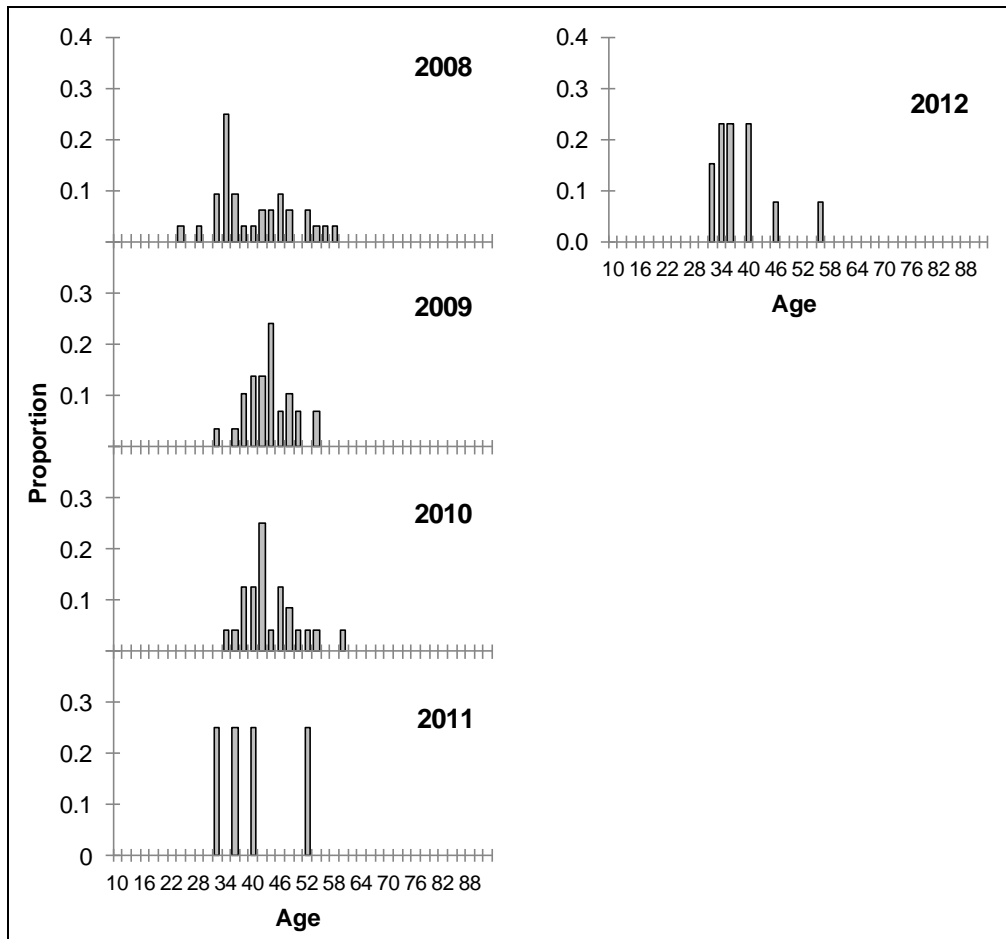


Figure 2.31. Annual length-frequency distributions of spotted seatrout collected by NCDMF Program 915 during spring (May–June) in the southern sampling stations, 2008–2012.

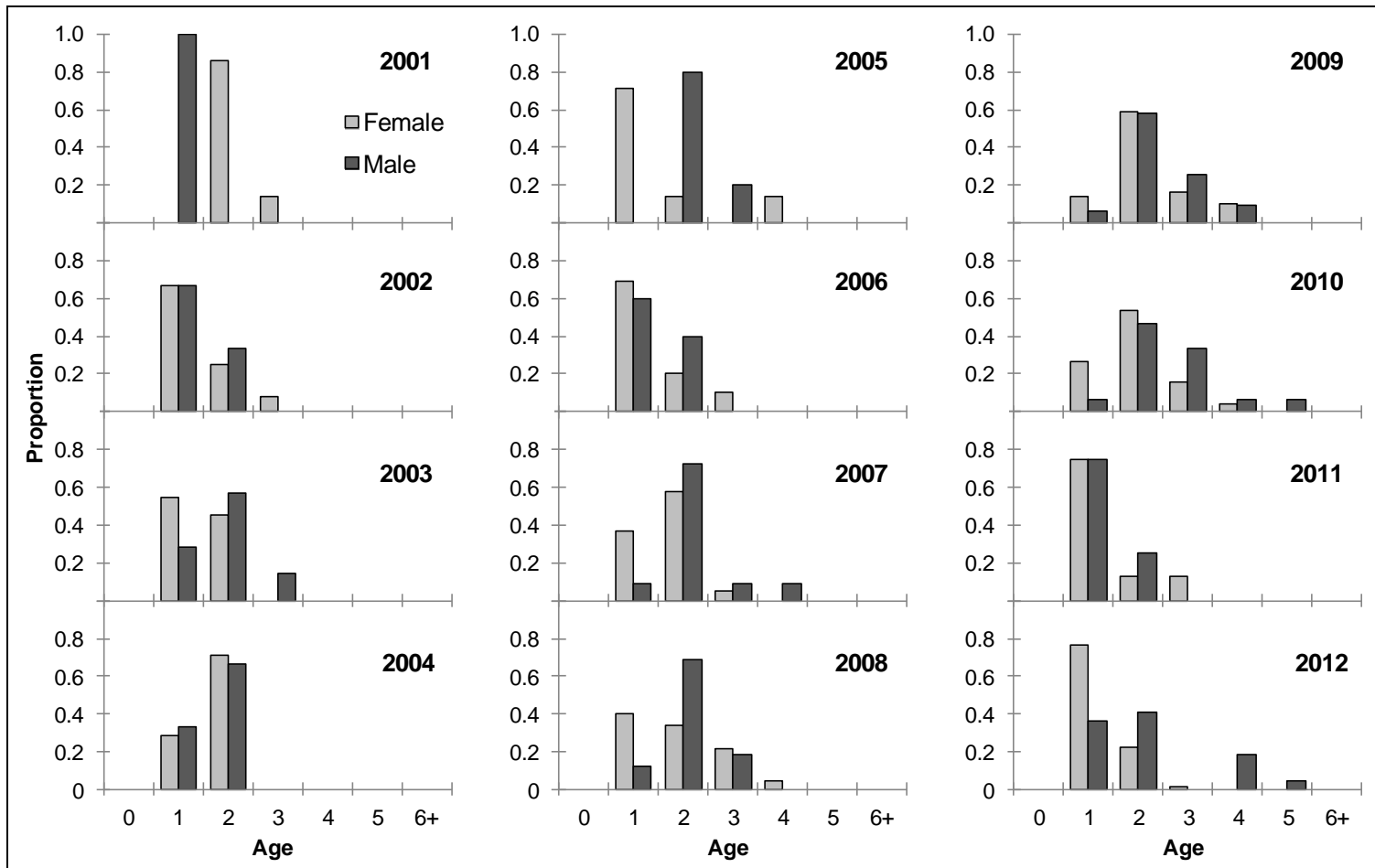


Figure 2.32. Annual age-frequency distributions of spotted seatrout collected by NCDMF Program 915 during spring (May–June) by sex, 2001–2012.

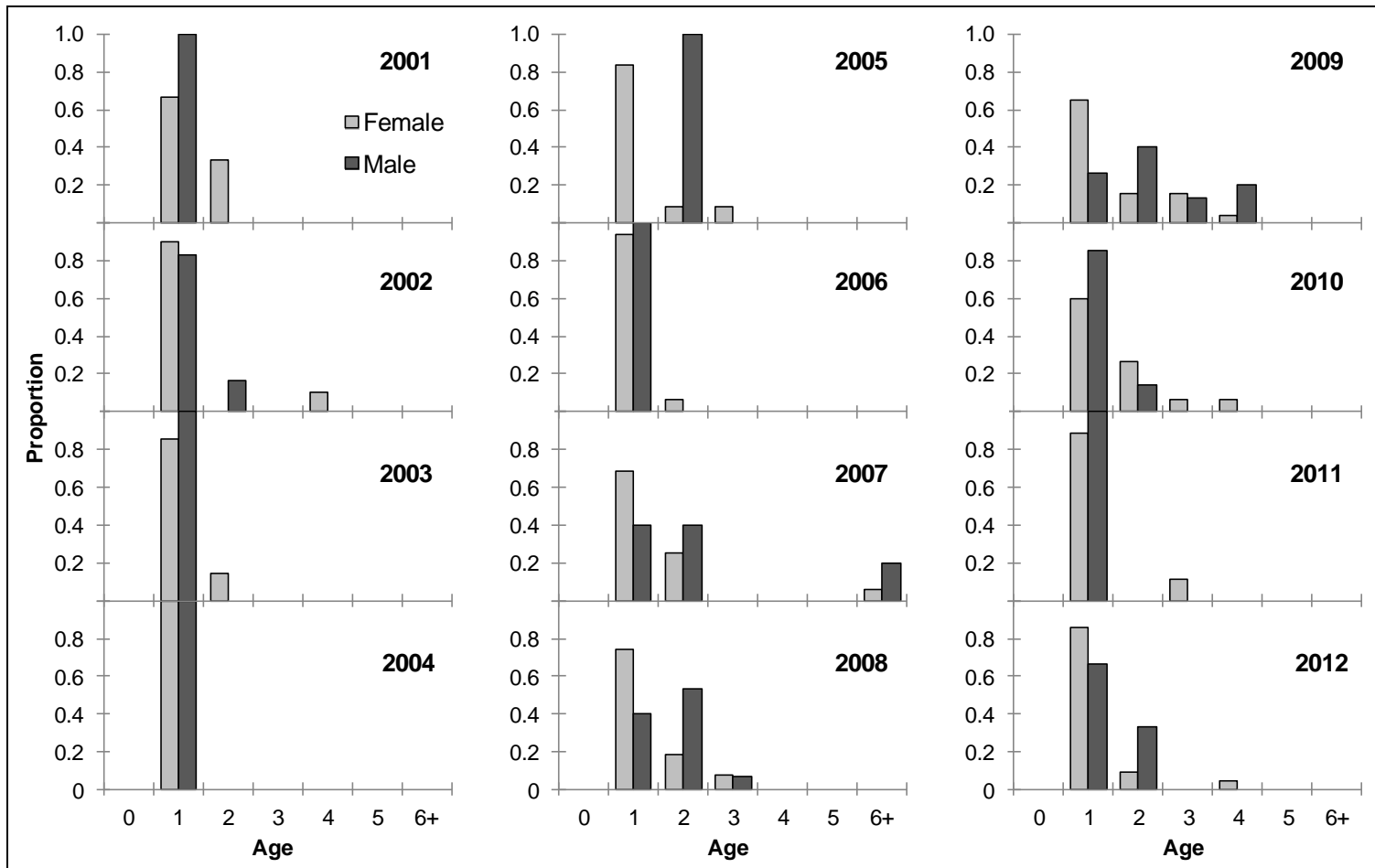


Figure 2.33. Annual age-frequency distributions of spotted seatrout collected by NCDMF Program 915 during summer (July–August) by sex, 2001–2012.

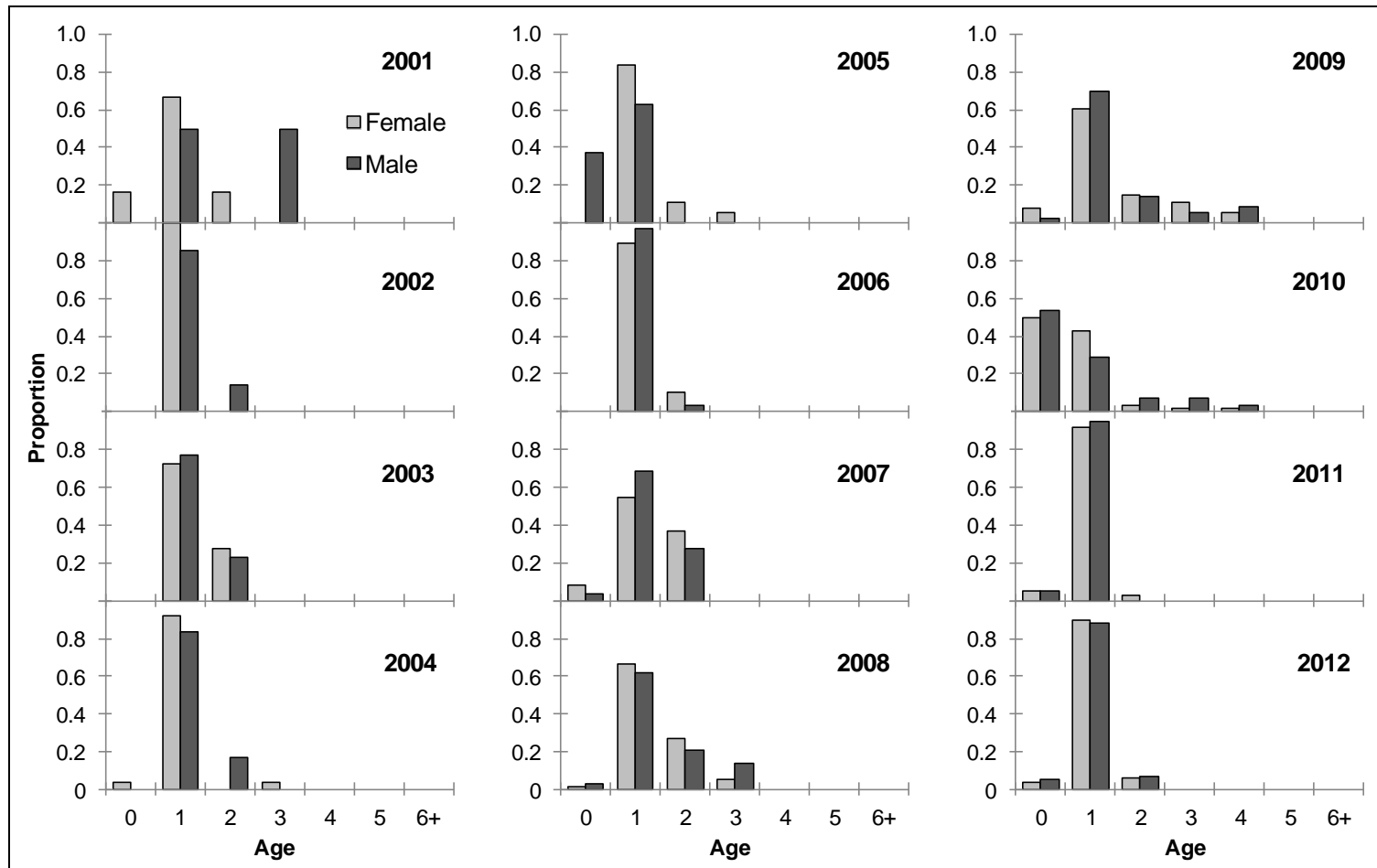


Figure 2.34. Annual age-frequency distributions of spotted seatrout collected by NCDMF Program 915 during fall (September–November) by sex, 2001–2012.

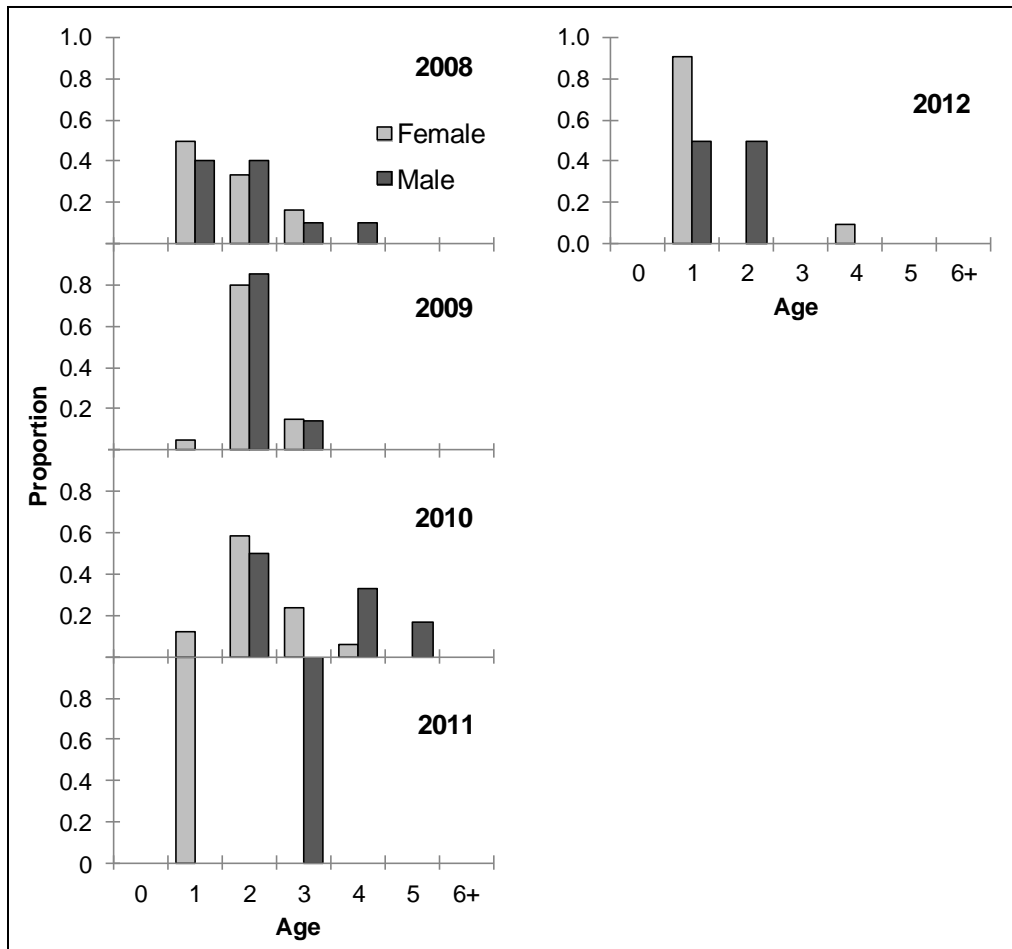


Figure 2.35. Annual age-frequency distributions of spotted seatrout collected by NCDMF Program 915 during spring (May–June) in the southern sampling stations by sex, 2008–2012.

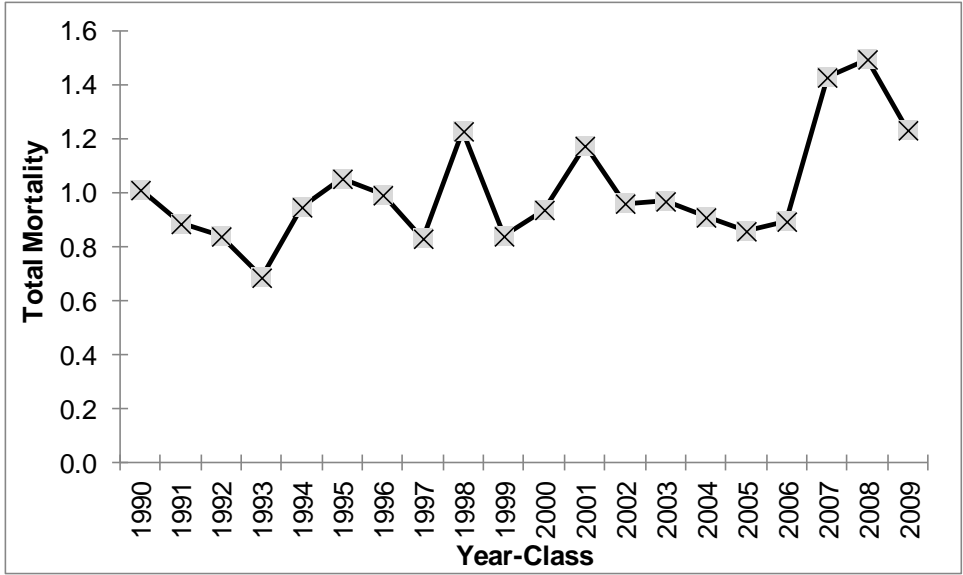


Figure 3.1. Catch curve estimates of instantaneous total mortality for true cohorts.

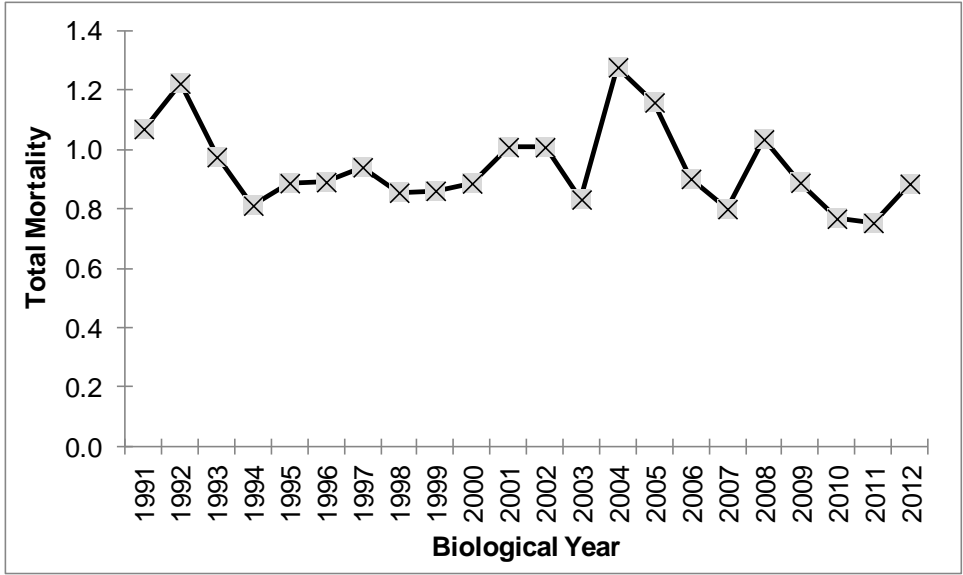


Figure 3.2. Catch curve estimates of instantaneous total mortality for synthetic cohorts.

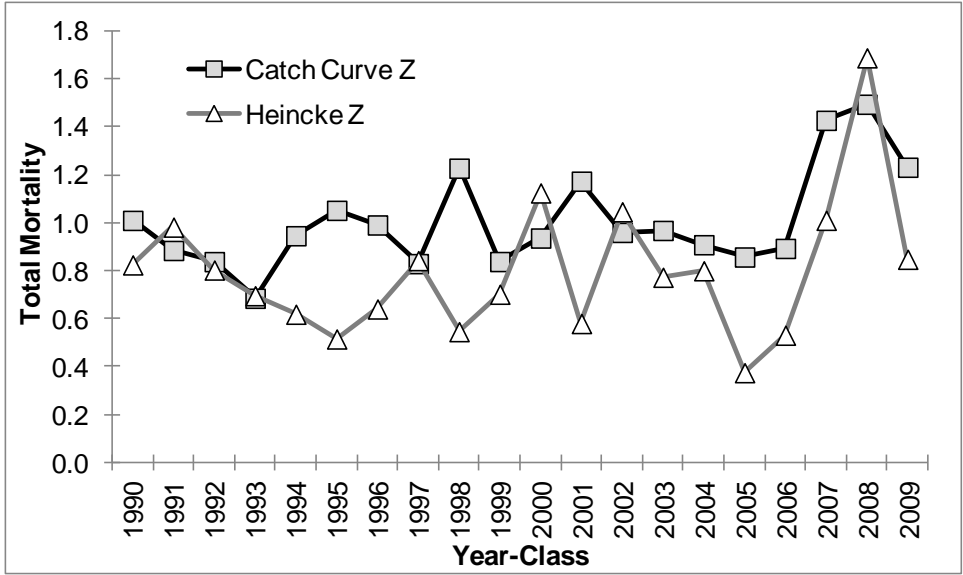


Figure 3.3. Comparison of total mortality rates estimated by catch curves and Heincke’s method for true cohorts.

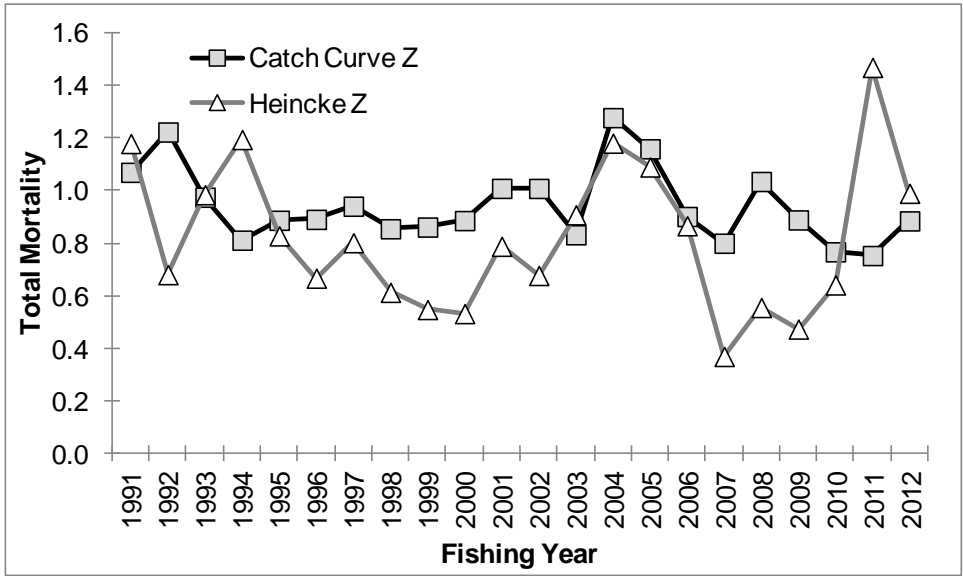


Figure 3.4. Comparison of total mortality rates estimated by catch curves and Heincke’s method for synthetic cohorts.

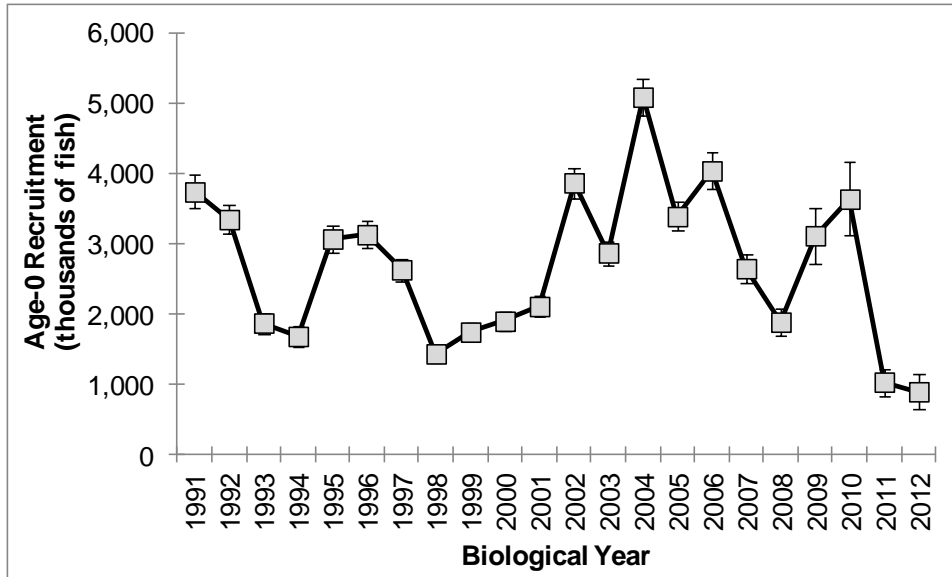


Figure 3.5. Annual estimates of age-0 recruitment from the base run of the assessment model, 1994–2012. Error bars represent +/- 1 standard deviation.

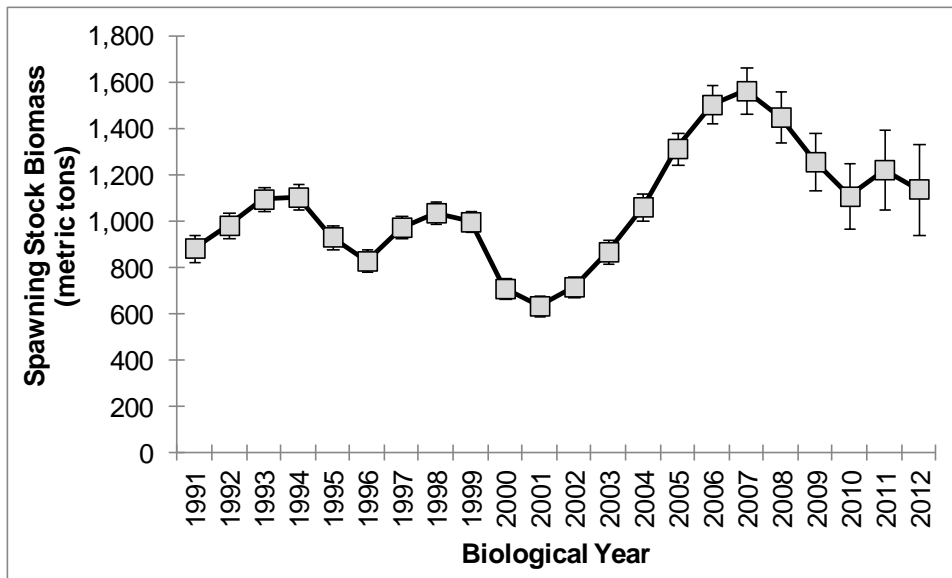


Figure 3.6. Annual estimates of spawning stock biomass from the base run of the assessment model, 1994–2012. Error bars represent +/- 1 standard deviation.

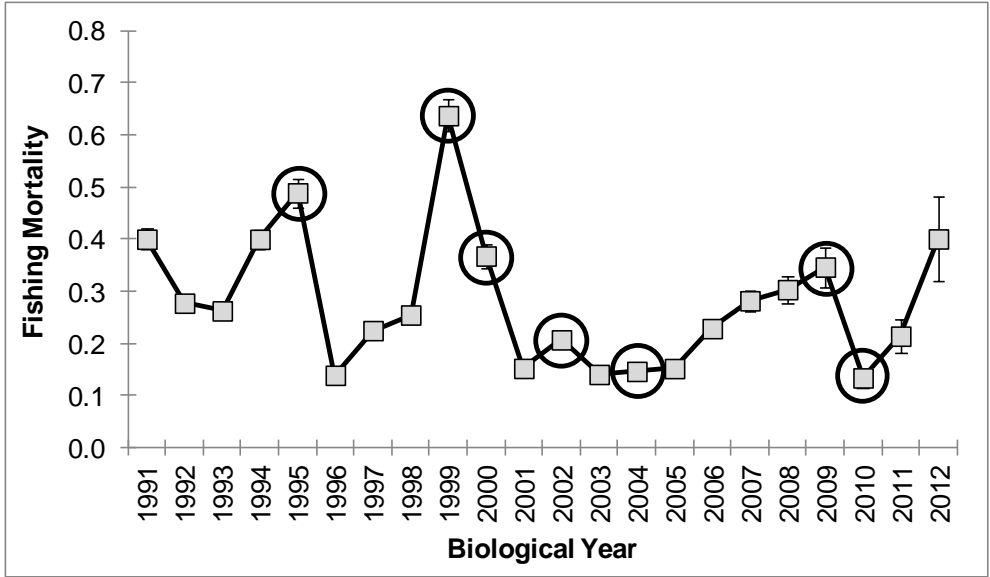


Figure 3.7. Annual estimates of fishing mortality (numbers-weighted, ages 1–4) from the base run of the assessment model, 1994–2012. Error bars represent ± 1 standard deviation. Circles indicate years associated with known cold-stun events.

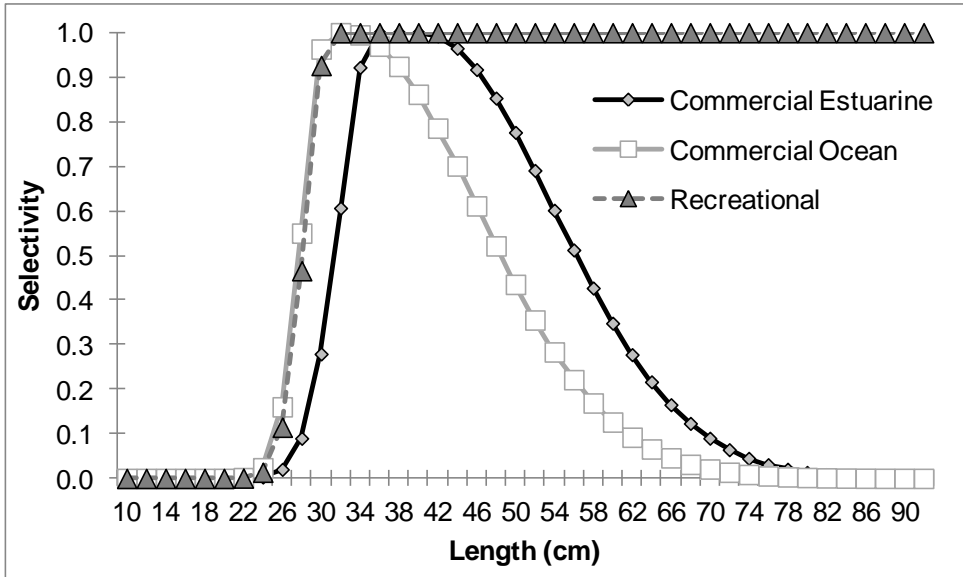


Figure 3.8. Predicted selectivity curves for the fishing fleets from the base run of the assessment model.

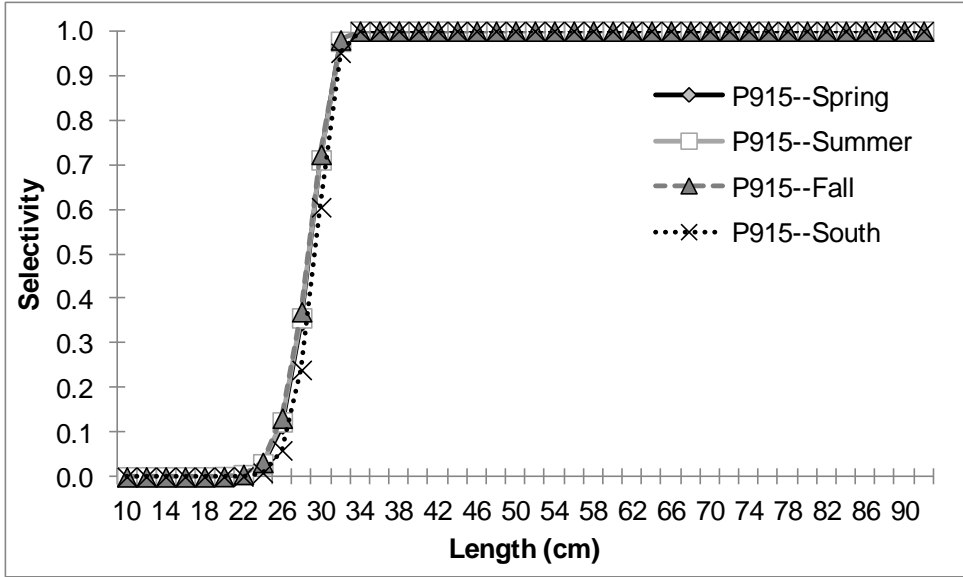


Figure 3.9. Predicted selectivity curves for the fisheries-independent surveys from the base run of the assessment model.

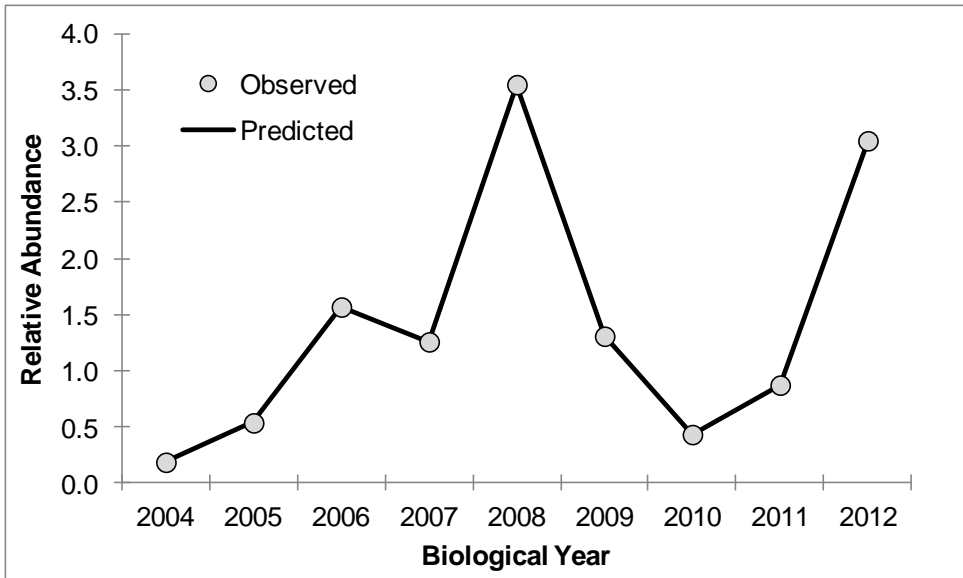


Figure 3.10. Observed and predicted values for the Program 120 index of age-0 relative abundance from the base run of the assessment model.

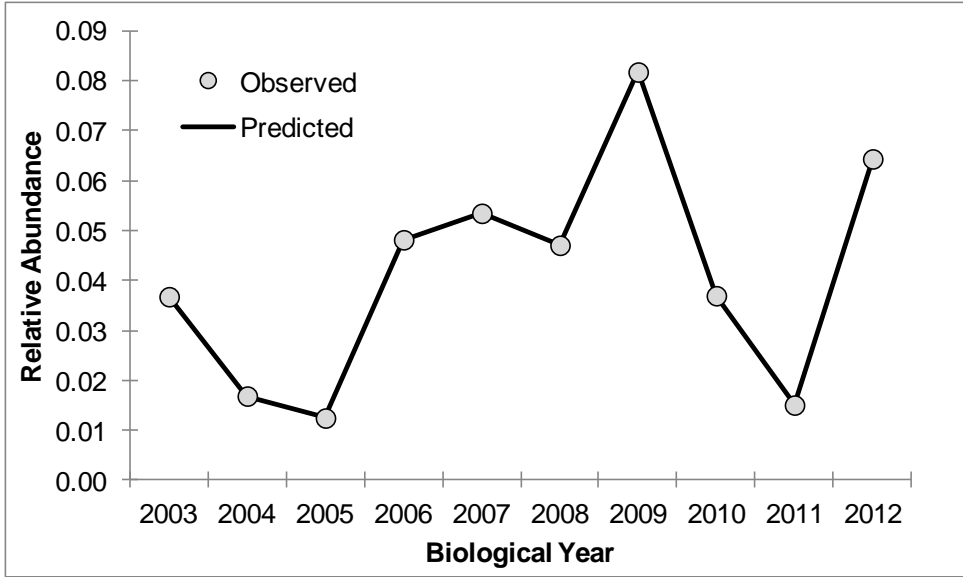


Figure 3.11. Observed and predicted values for the Program 915 spring (May–June) index of relative abundance from the base run of the assessment model.

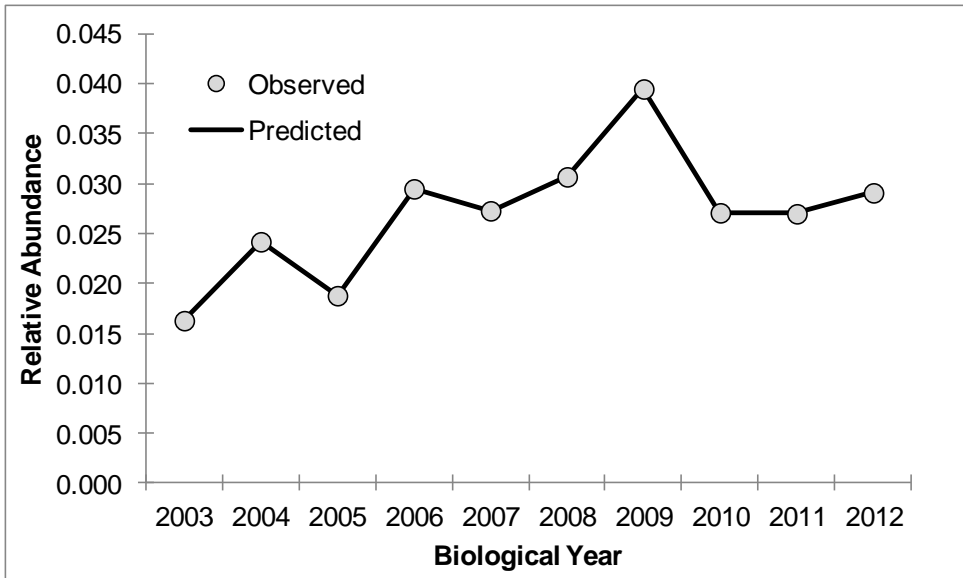


Figure 3.12. Observed and predicted values for the Program 915 summer (July–August) index of relative abundance from the base run of the assessment model.

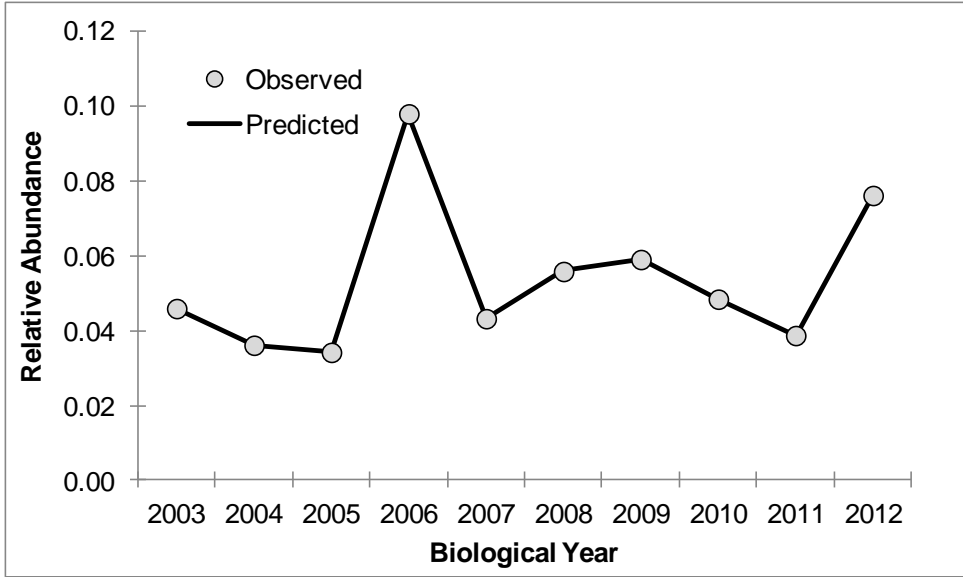


Figure 3.13. Observed and predicted values for the Program 915 fall (September–November) index of relative abundance from the base run of the assessment model.

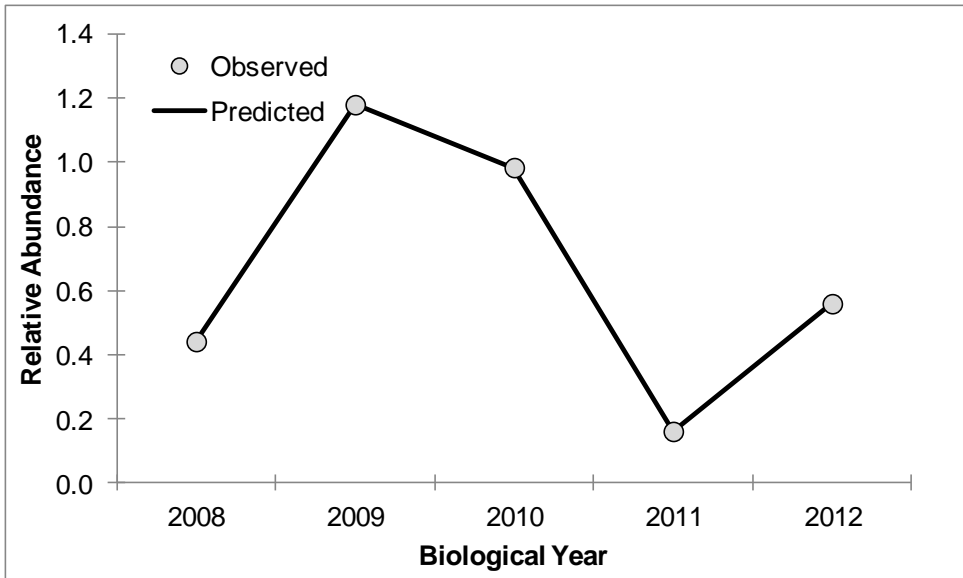


Figure 3.14. Observed and predicted values for the Program 915 southern (May–June) index of relative abundance from the base run of the assessment model.

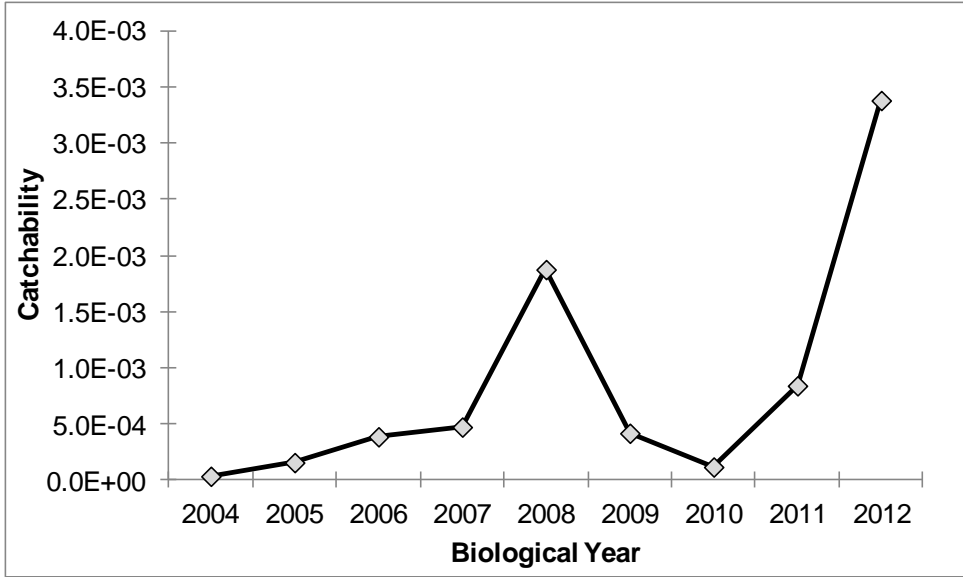


Figure 3.15. Annual predicted catchability for the Program 120 index of age-0 relative abundance from the base run of the assessment model.

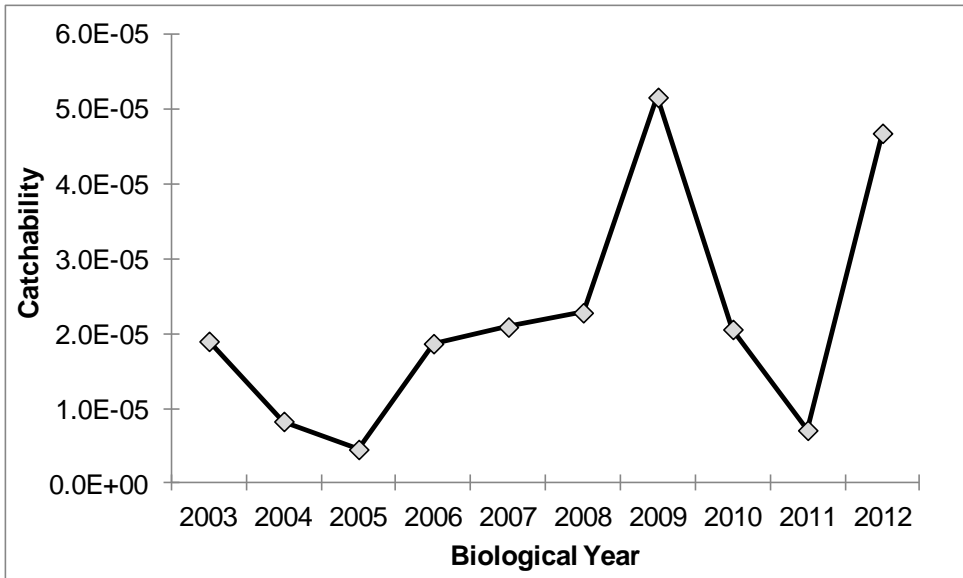


Figure 3.16. Annual predicted catchability for the Program 915 spring (May–June) index of relative abundance from the base run of the assessment model.

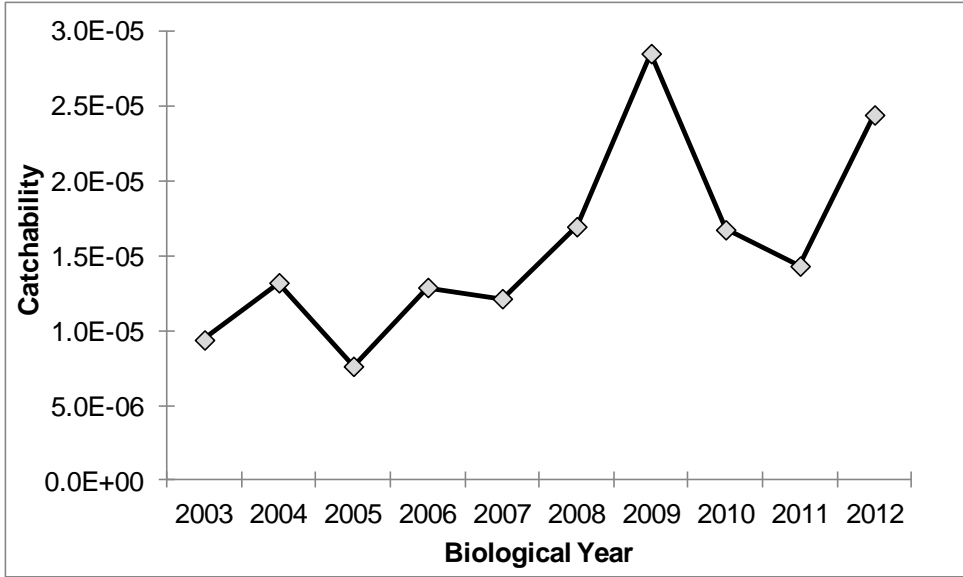


Figure 3.17. Annual predicted catchability for the Program 915 summer (July–August) index of relative abundance from the base run of the assessment model.

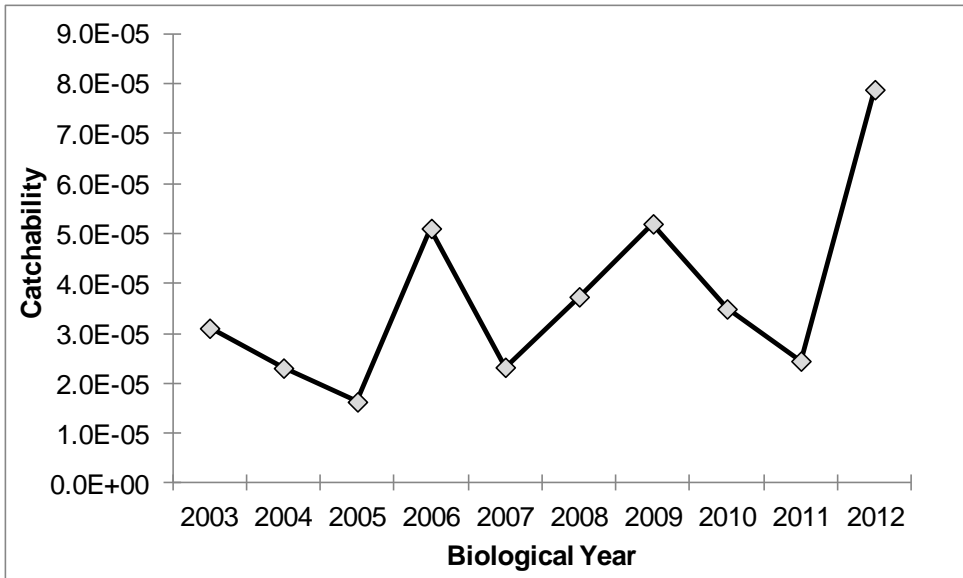


Figure 3.18. Annual predicted catchability for the Program 915 fall (September–November) index of relative abundance from the base run of the assessment model.

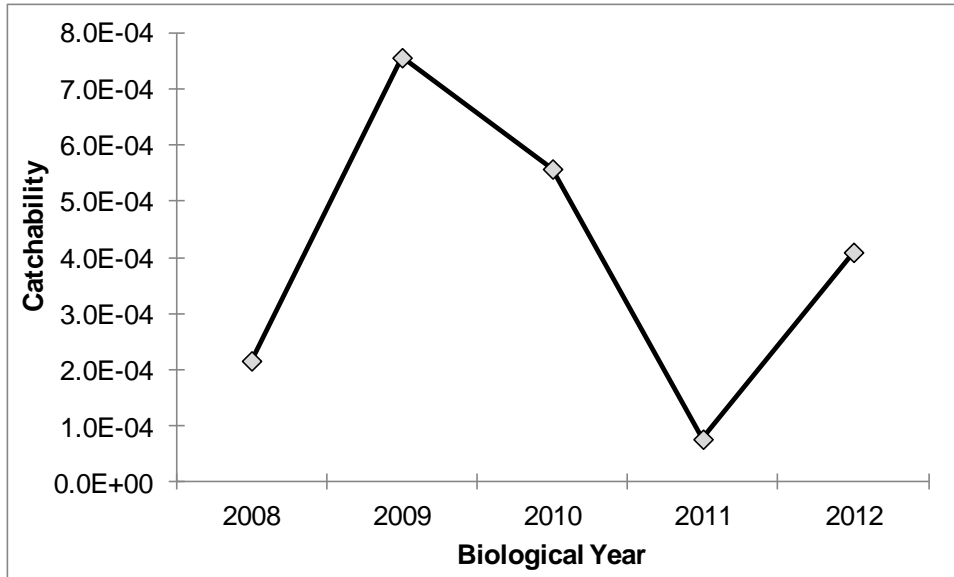


Figure 3.19. Annual predicted catchability for the Program 915 southern (May–June) index of relative abundance from the base run of the assessment model.

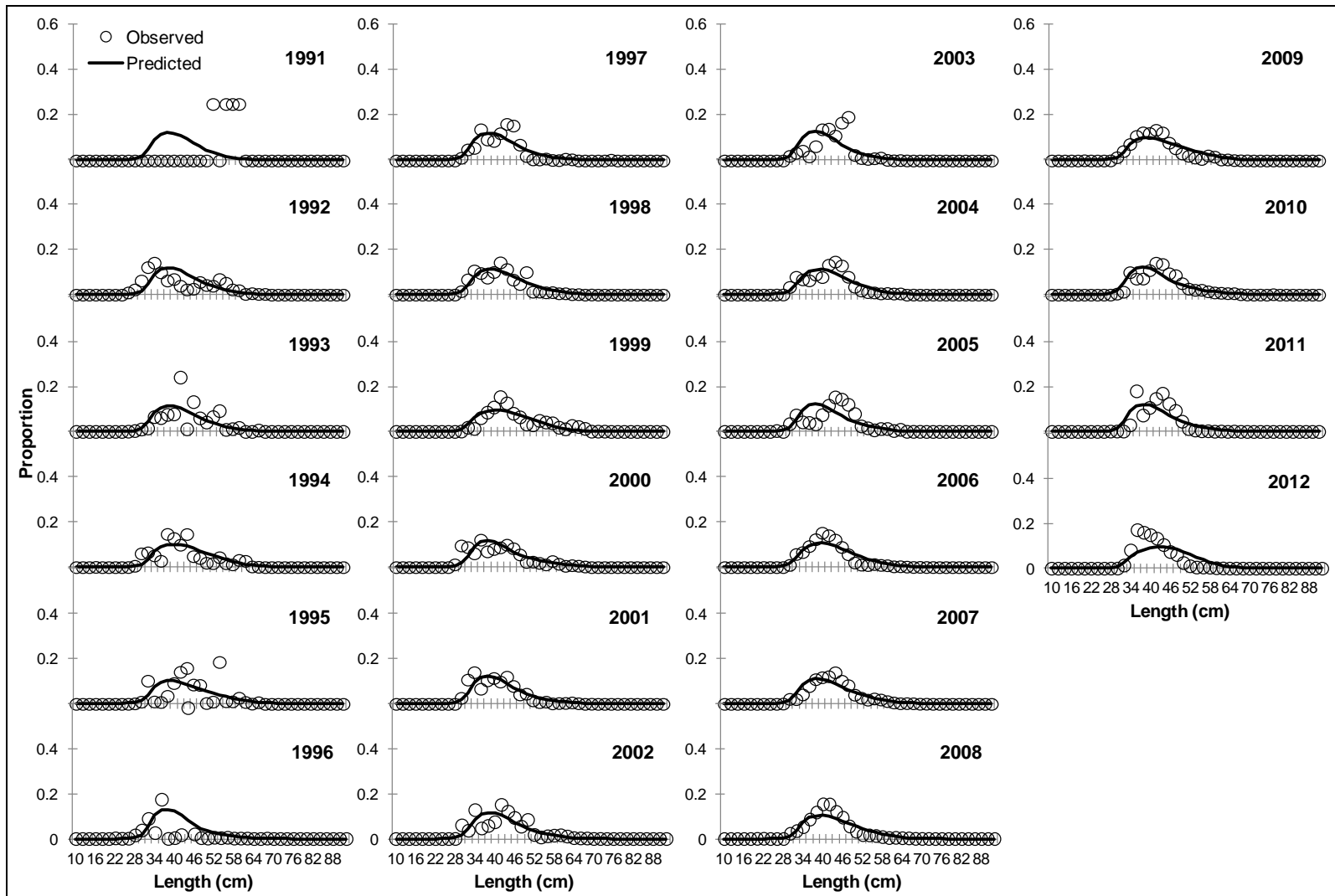


Figure 3.20. Observed and predicted length-frequency distributions for commercial estuarine landings from the base run of the assessment model.

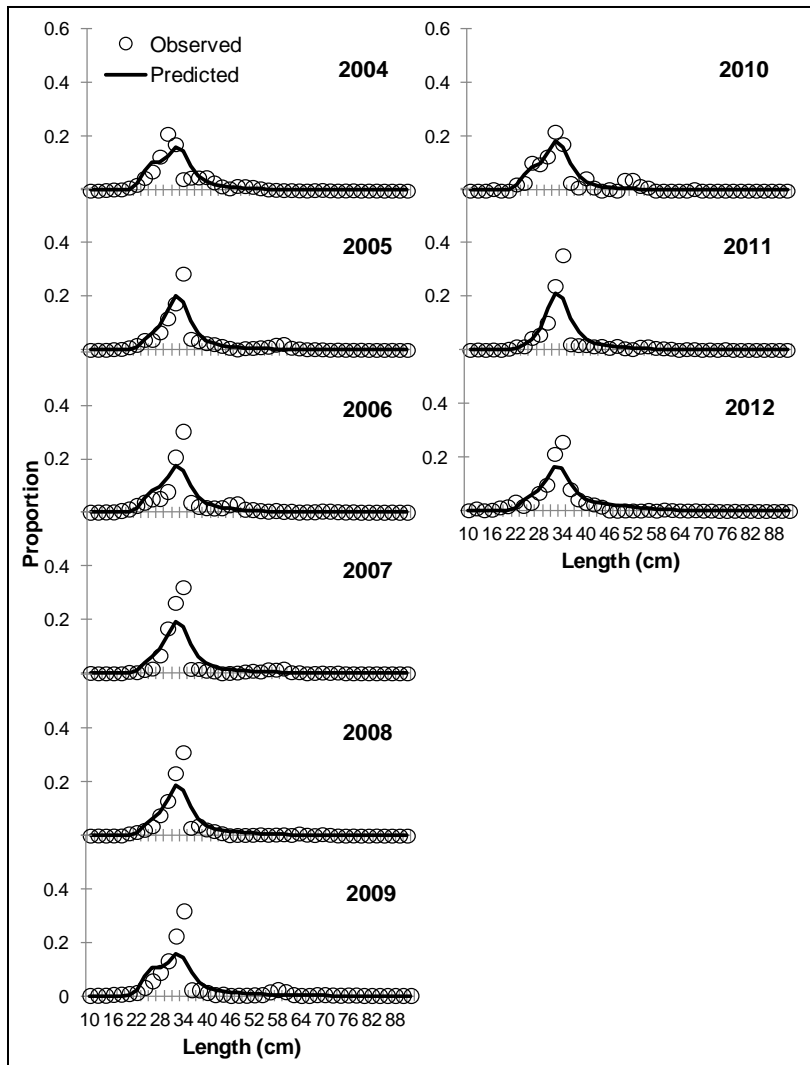


Figure 3.21. Observed and predicted length-frequency distributions for commercial estuarine dead discards from the base run of the assessment model.

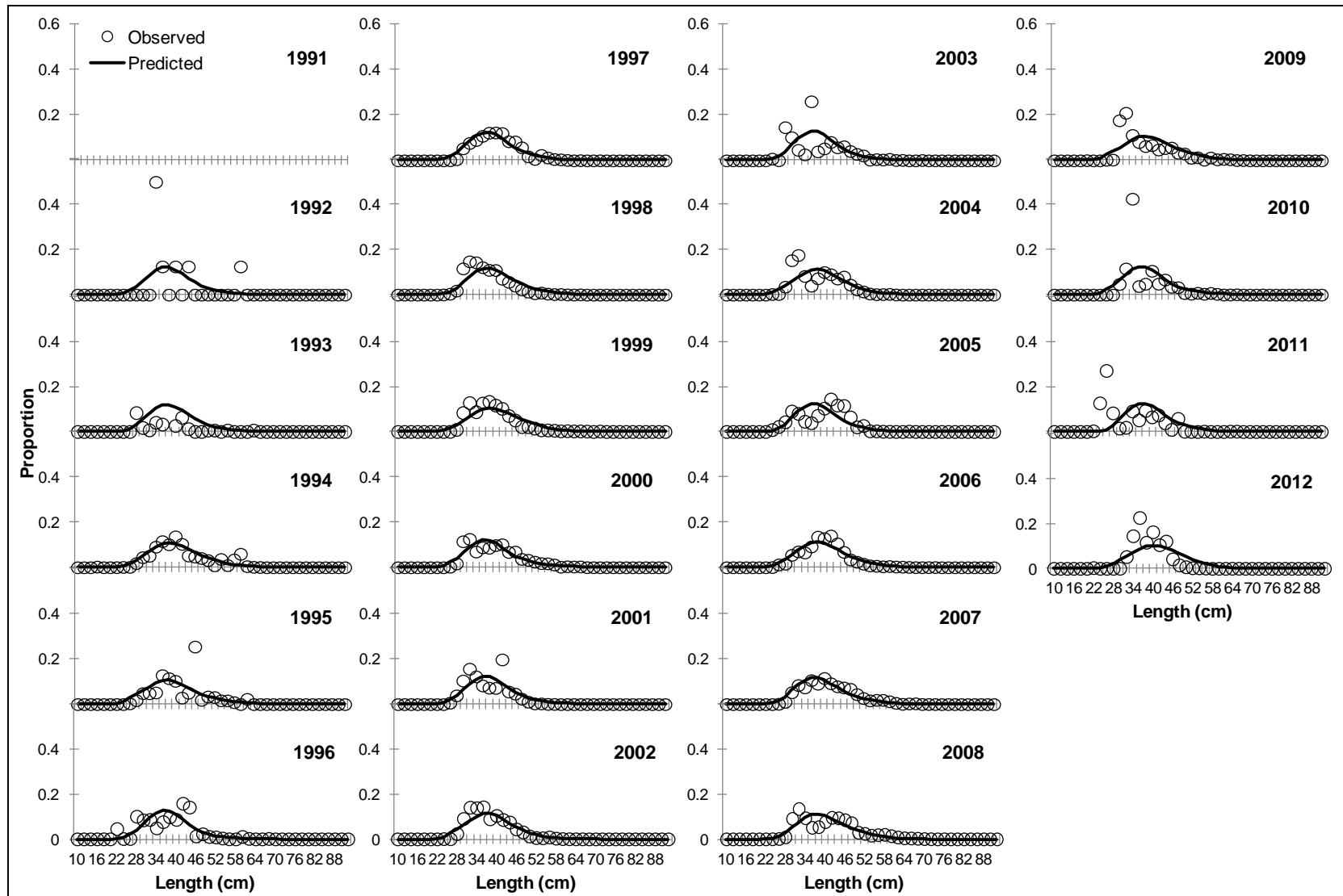


Figure 3.22. Observed and predicted length-frequency distributions for commercial ocean landings from the base run of the assessment model.

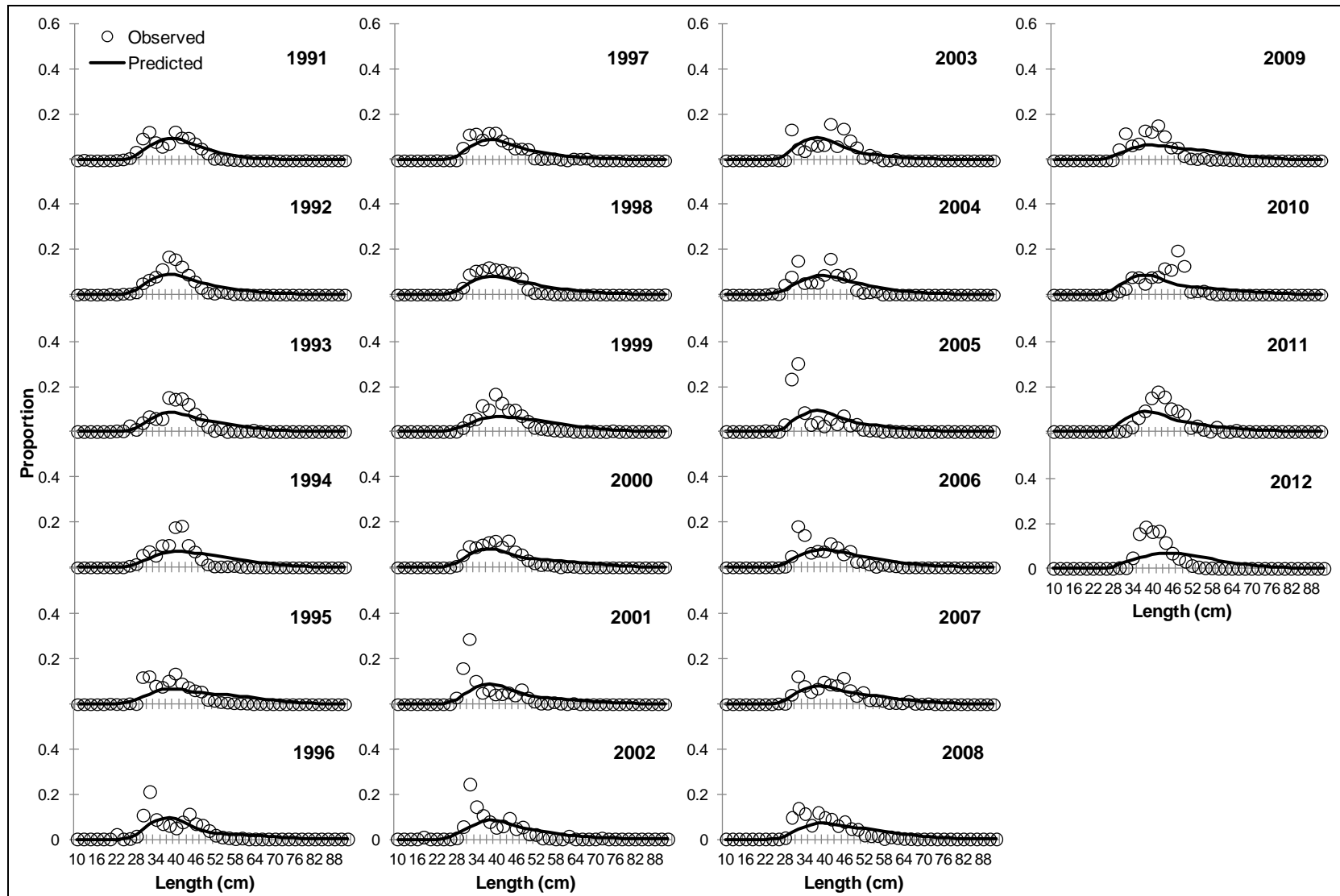


Figure 3.23. Observed and predicted length-frequency distributions for recreational landings from the base run of the assessment model.

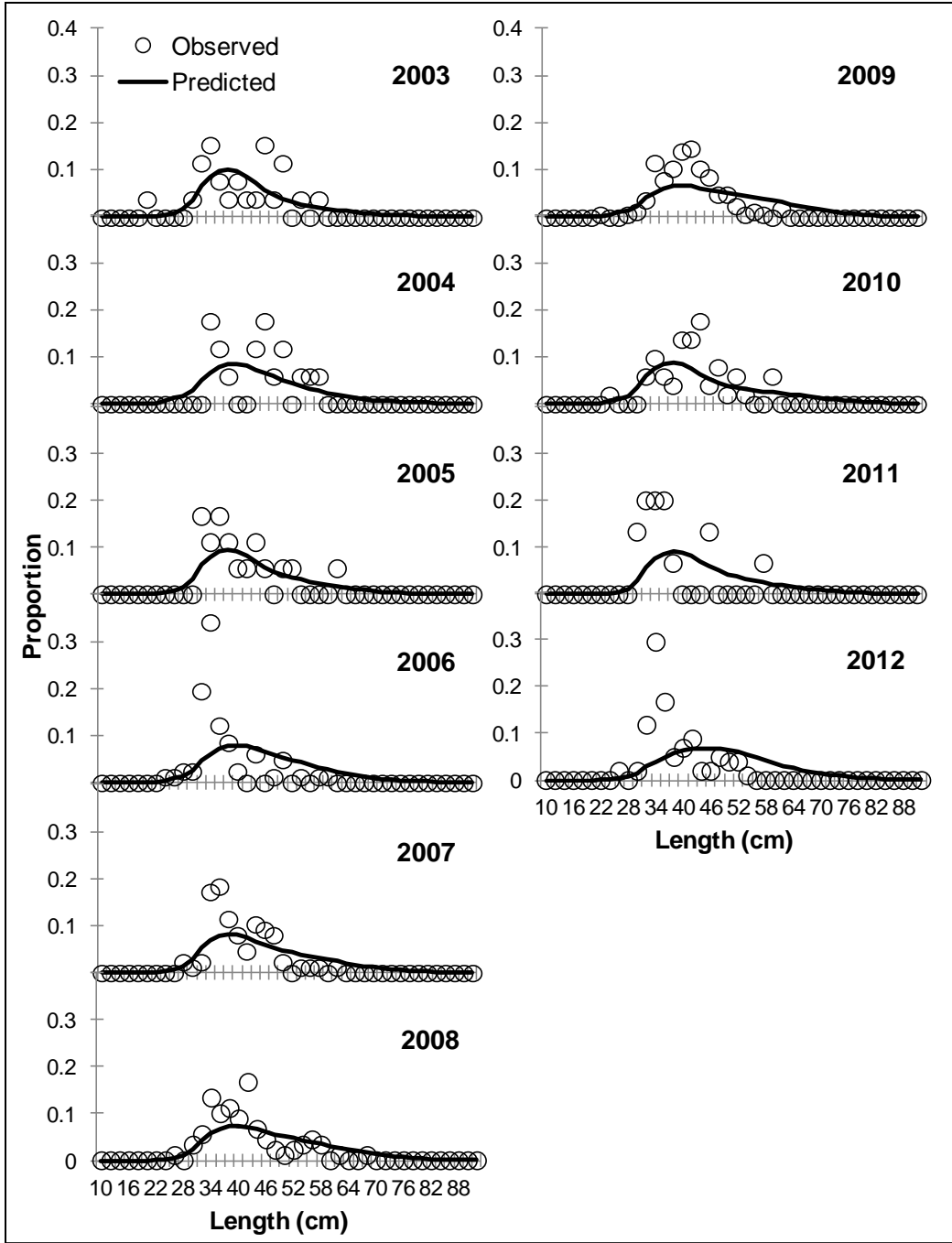


Figure 3.24. Observed and predicted length-frequency distributions for the spring component of Program 915 from the base run of the assessment model.

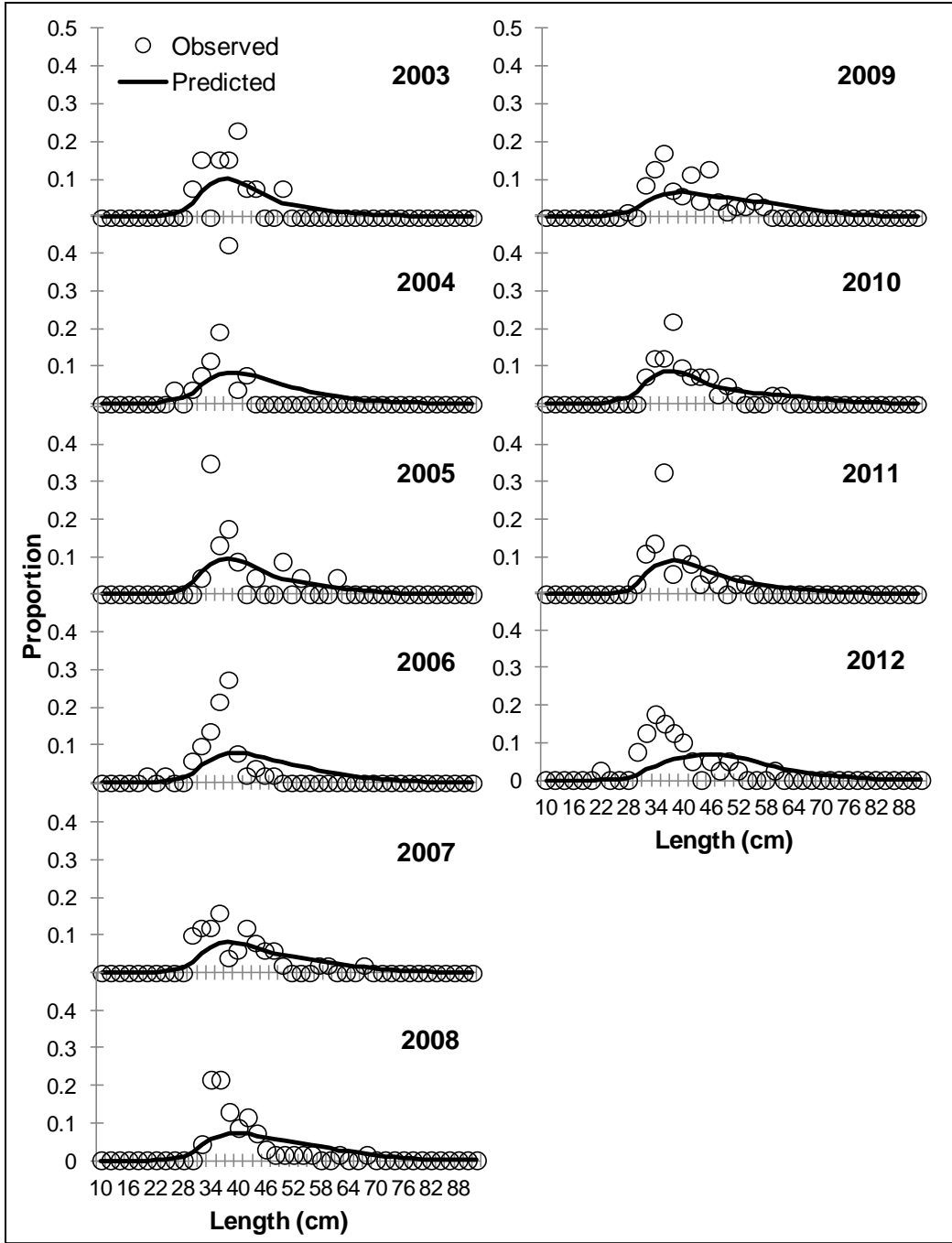


Figure 3.25. Observed and predicted length-frequency distributions for the summer component of Program 915 from the base run of the assessment model.

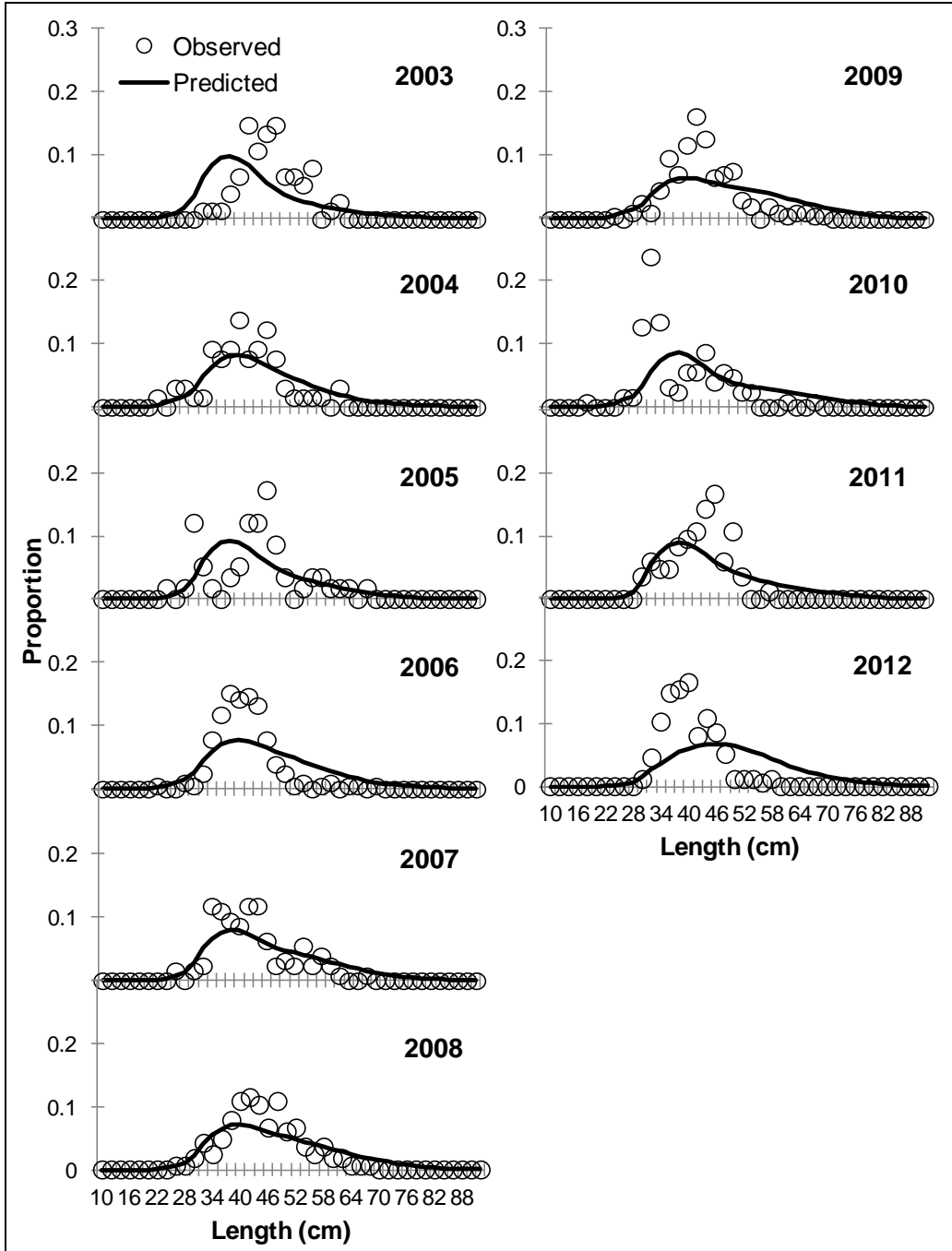


Figure 3.26. Observed and predicted length-frequency distributions for the fall component of Program 915 from the base run of the assessment model.

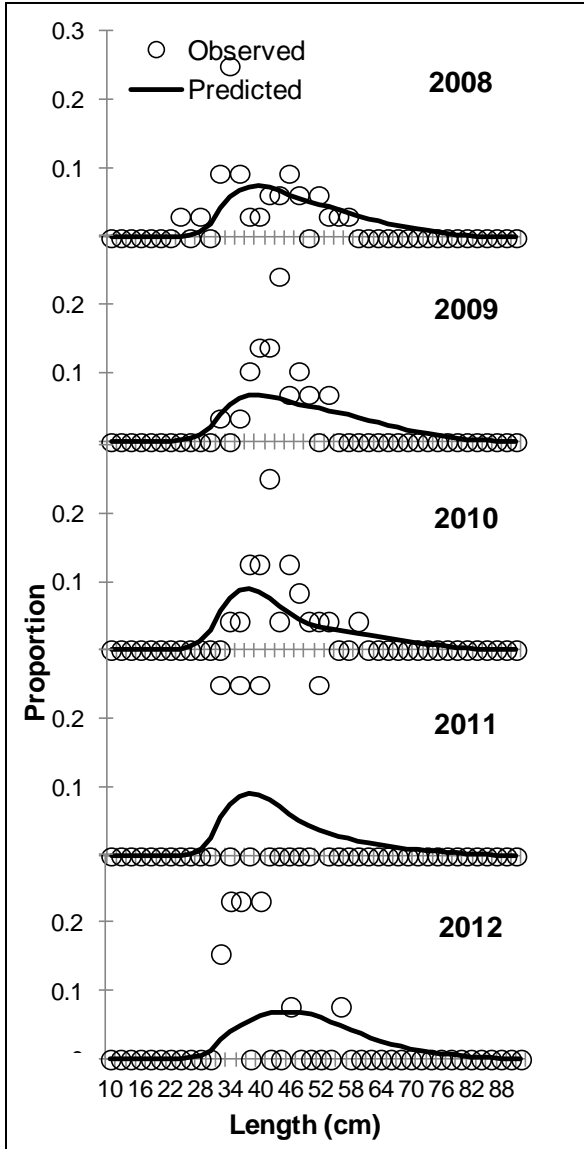


Figure 3.27. Observed and predicted length-frequency distributions for the southern component of Program 915 from the base run of the assessment model.

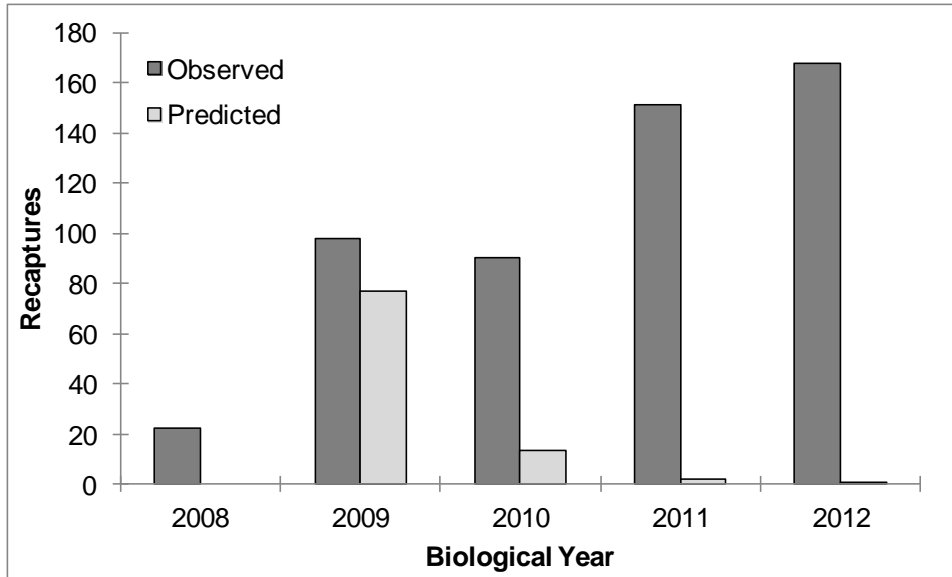


Figure 3.28. Observed and predicted tag recaptures aggregated across tag groups.

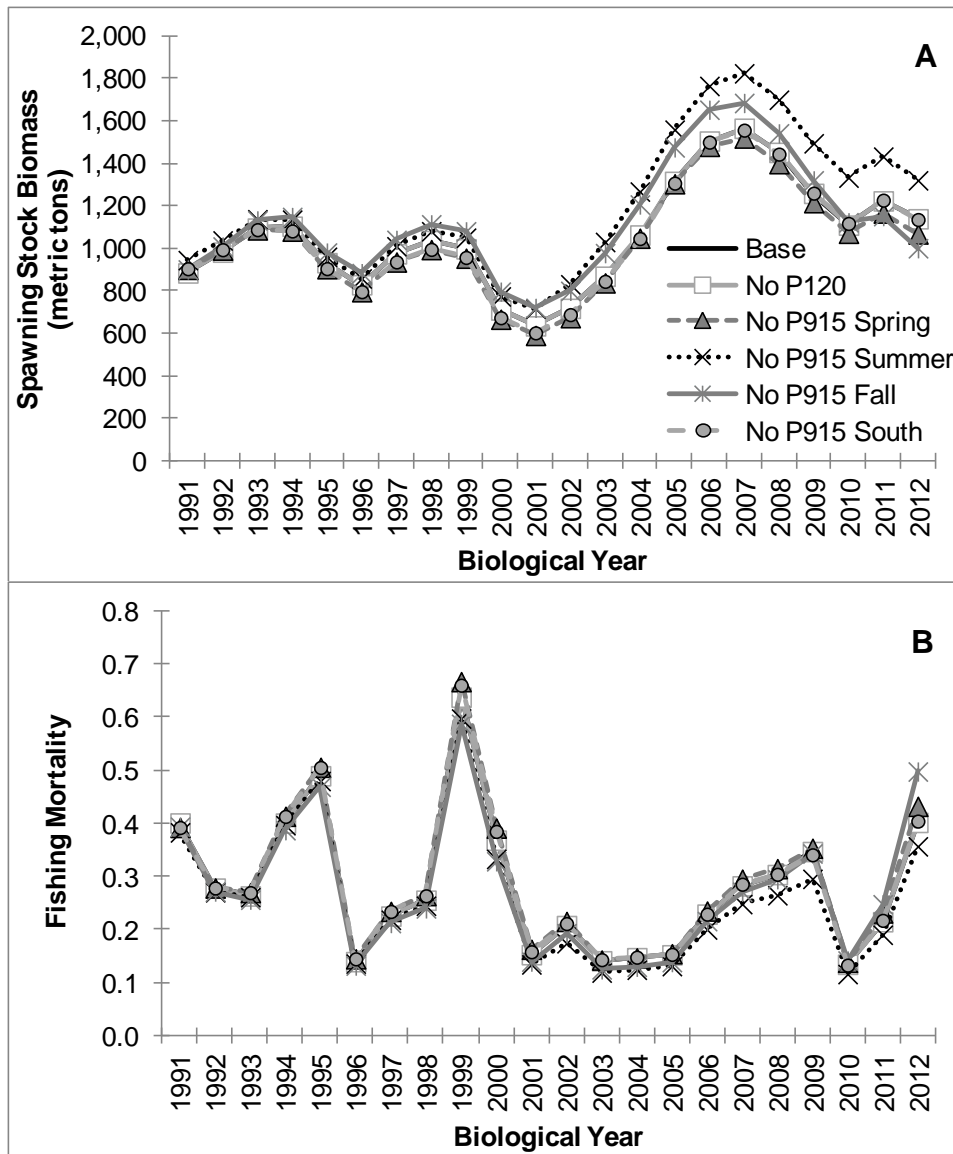


Figure 3.29. Sensitivity of model-predicted (A) SSB and (B) fishing mortality to removal of survey data (indices and associated biological data).

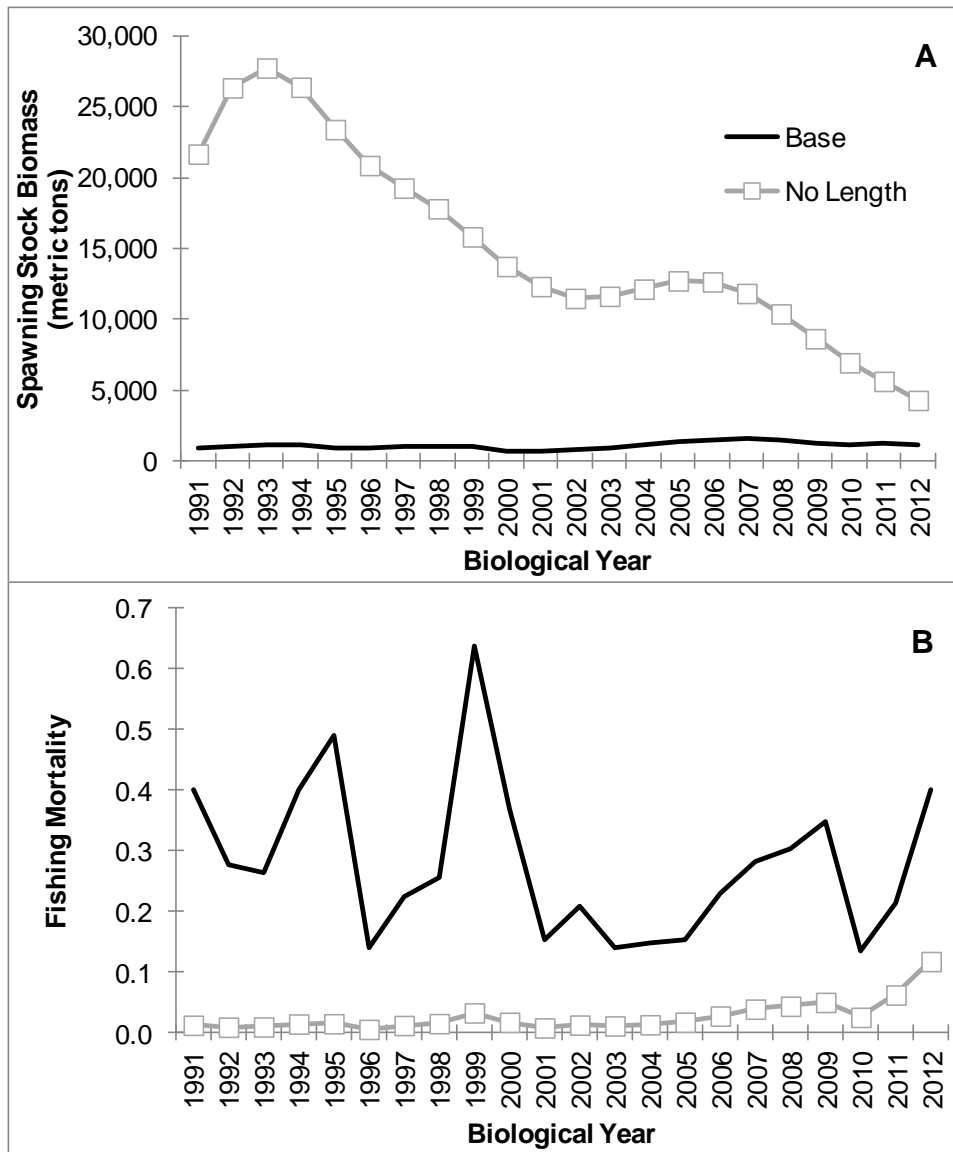


Figure 3.30. Sensitivity of model-predicted (A) SSB and (B) fishing mortality to removal of length data.

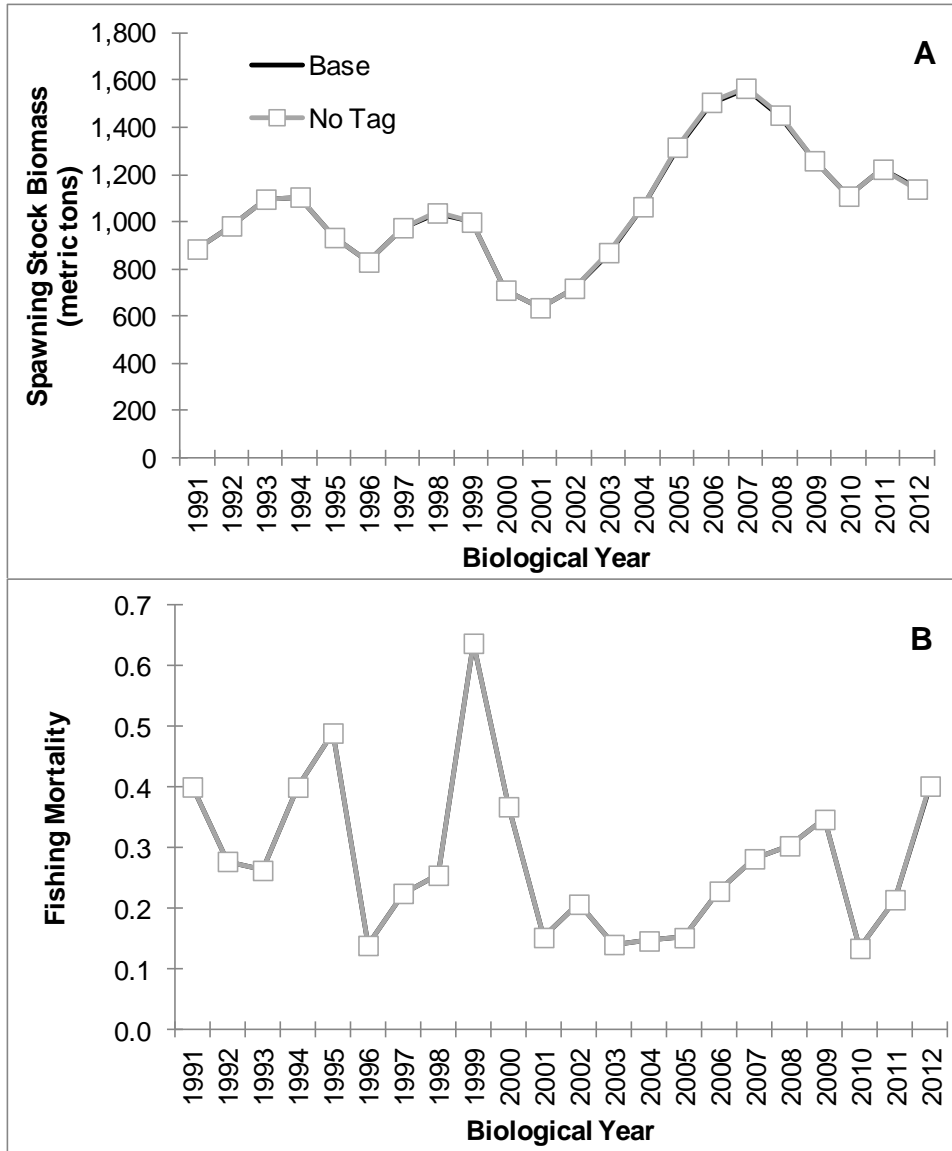


Figure 3.31. Sensitivity of model-predicted (A) SSB and (B) fishing mortality to removal of tag-recapture data.

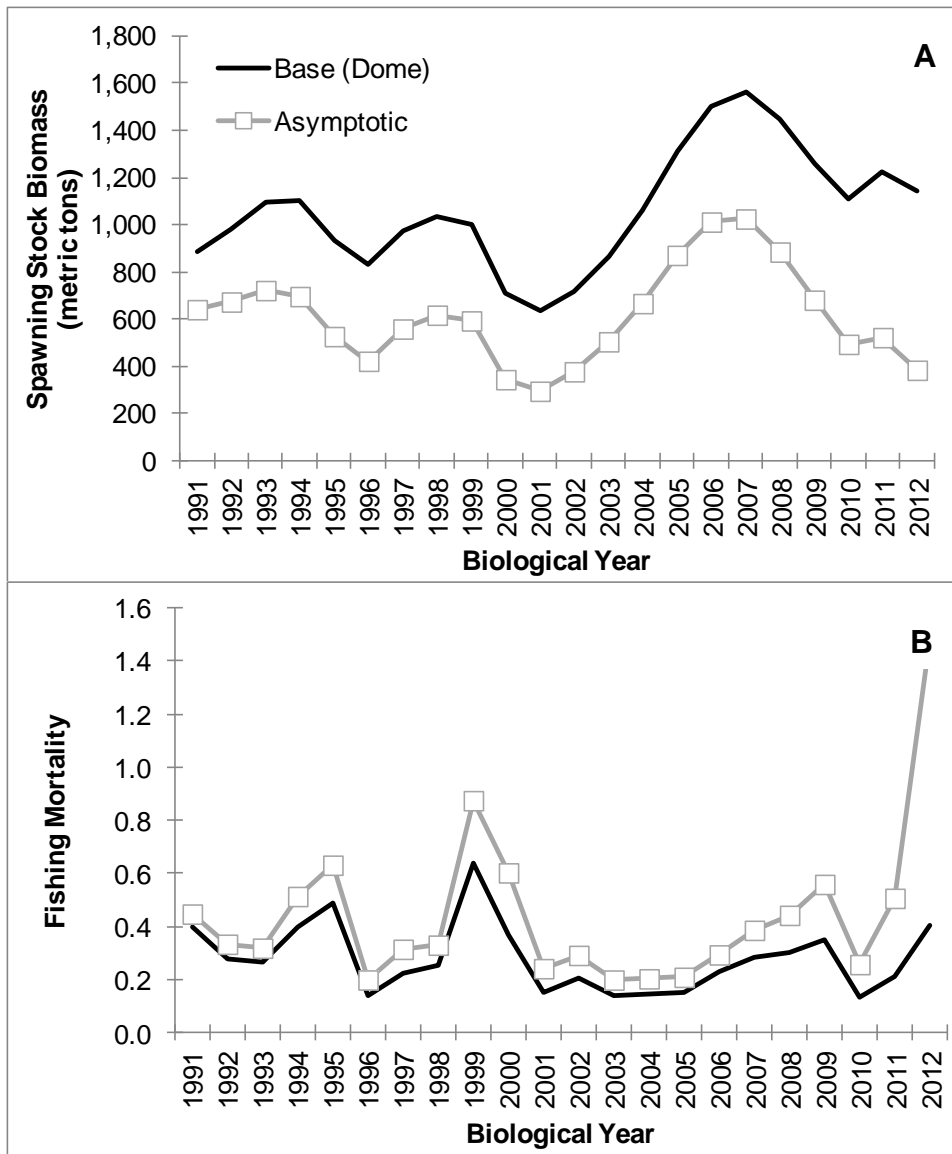


Figure 3.32. Sensitivity of model-predicted (A) SSB and (B) fishing mortality to shape of selectivity curve for the commercial fisheries.

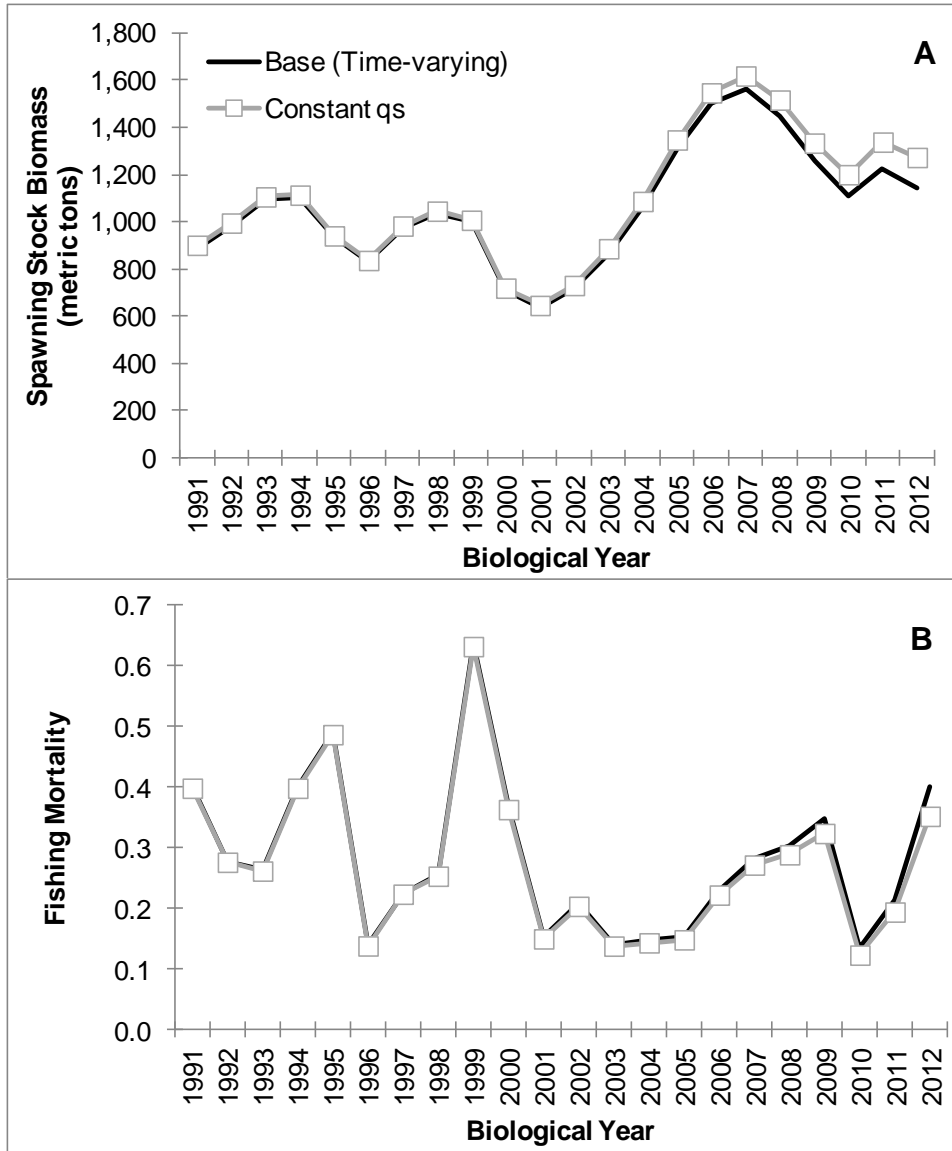


Figure 3.33. Sensitivity of model-predicted (A) SSB and (B) fishing mortality to assumption of survey catchabilities.

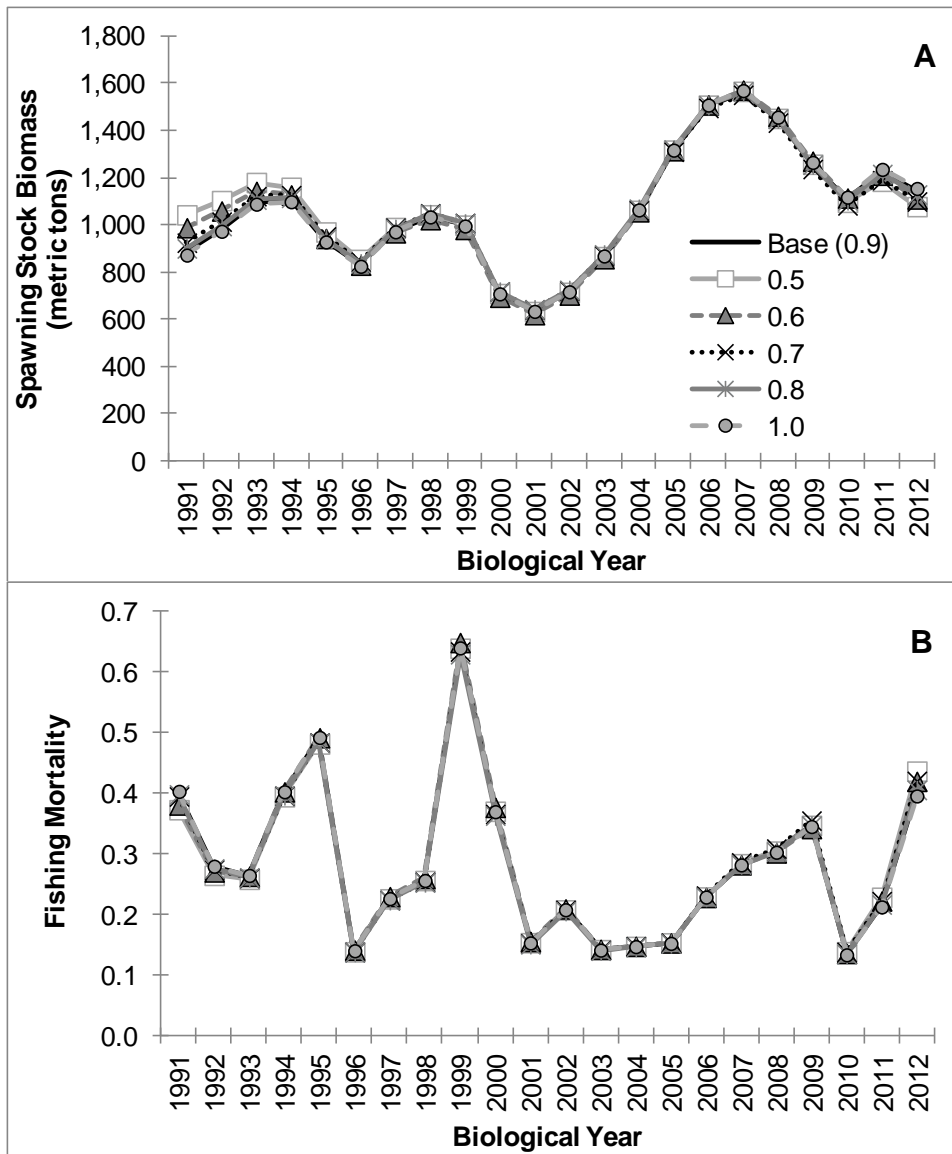


Figure 3.34. Sensitivity of model-predicted (A) SSB and (B) fishing mortality to a range of steepness values.

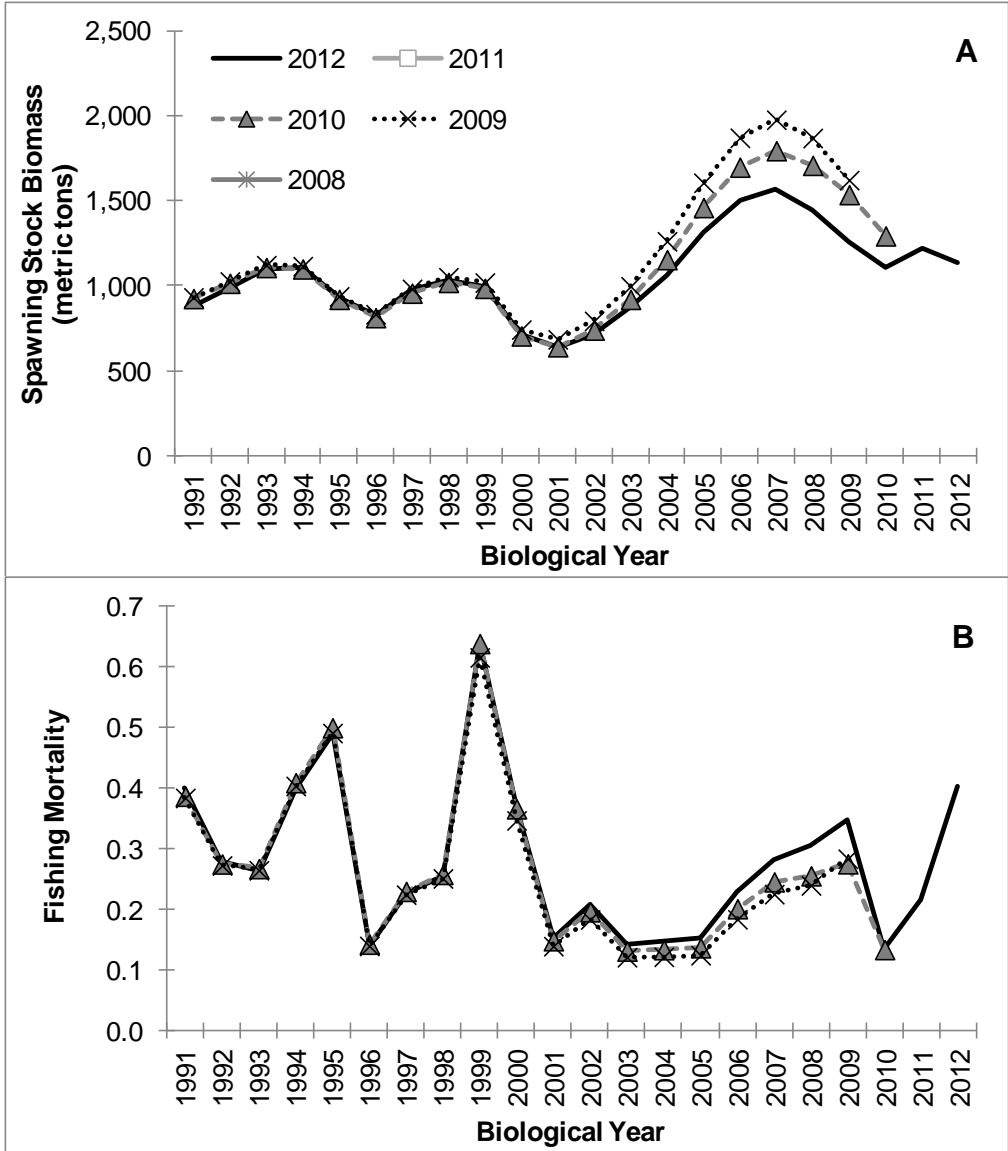


Figure 3.35. Model-predicted (A) SSB and (B) fishing mortality from the retrospective analysis.

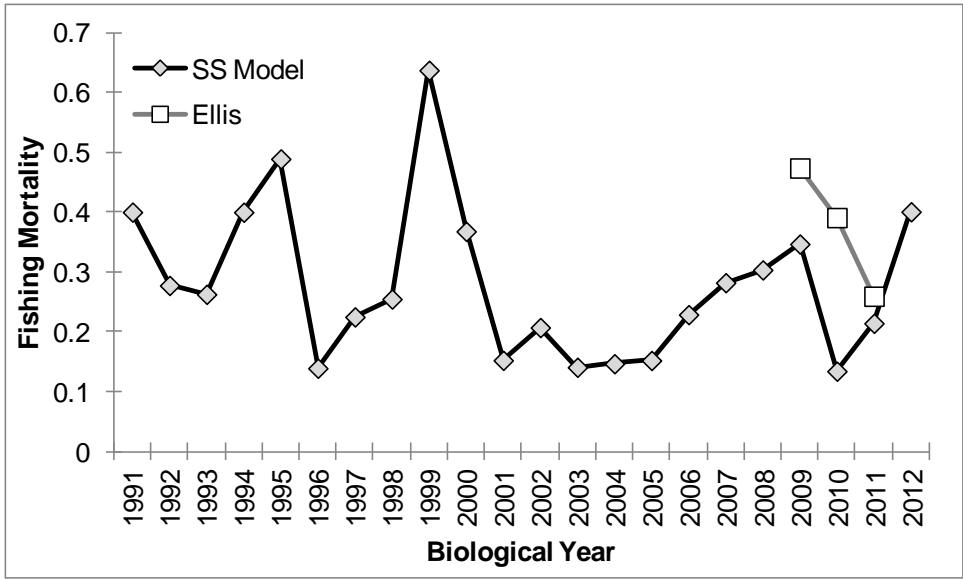


Figure 3.36. Comparison of fishing mortality rates estimated from the base run of the assessment model to those estimated by Ellis (2013, 2014).

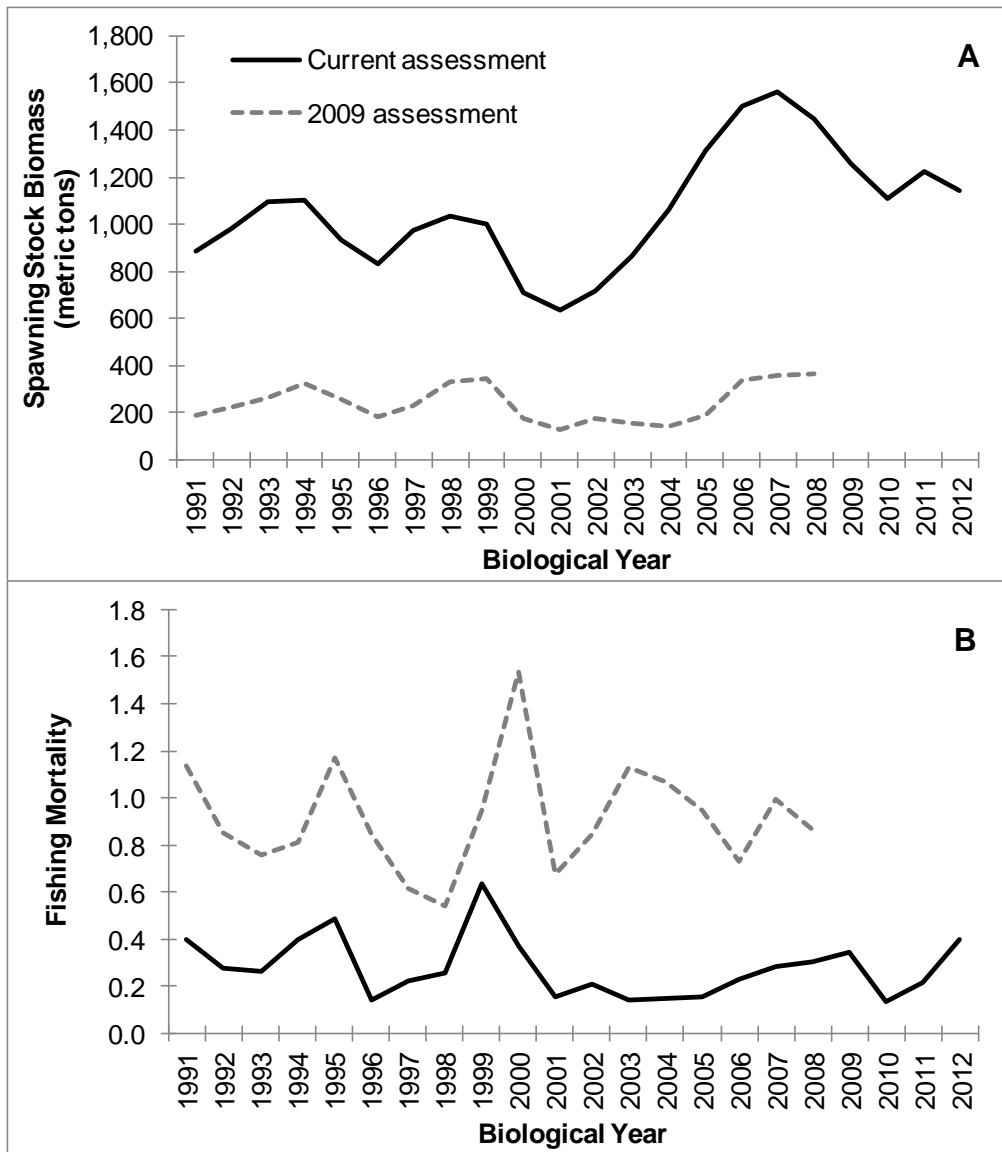


Figure 3.37. Comparison of predicted (A) SSB and (B) fishing mortality from this and previous (2009) assessment.

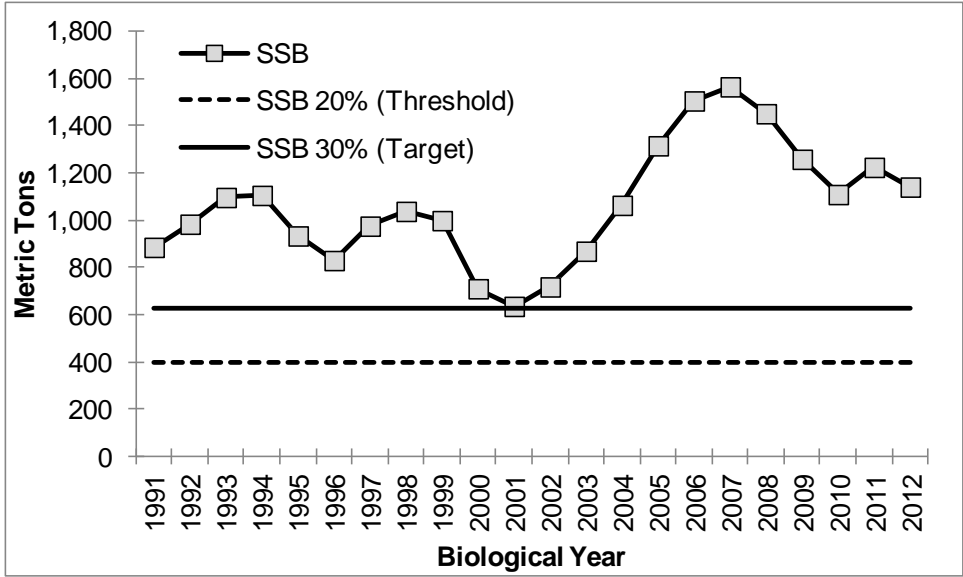


Figure 4.1. Annual predicted spawning stock biomass compared to estimated $SSB_{Threshold}$ ($SSB_{20\%}$) and SSB_{Target} ($SSB_{30\%}$).

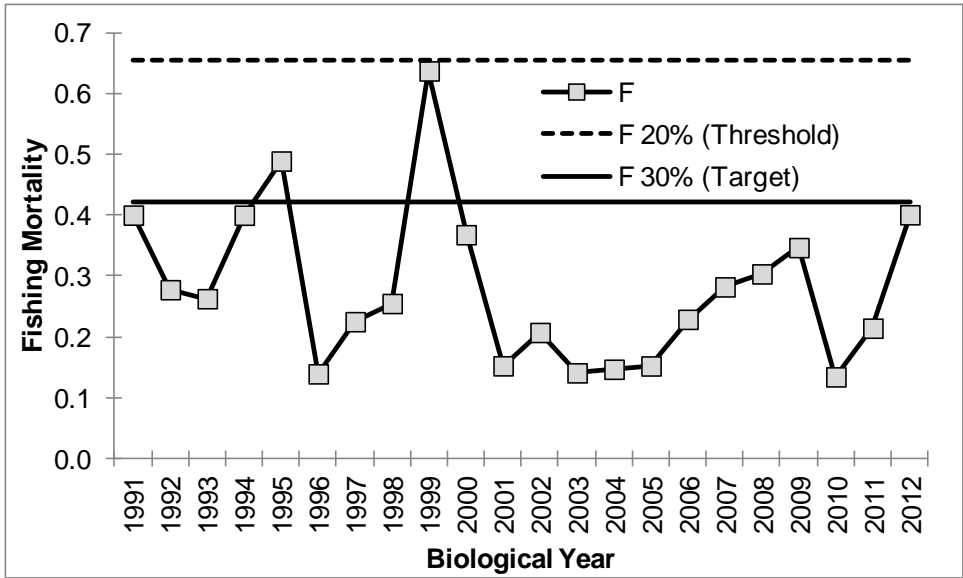


Figure 4.2. Annual predicted fishing mortality rates (numbers-weighted, ages 1–4) compared to estimated $F_{Threshold}$ ($F_{20\%}$) and F_{Target} ($F_{30\%}$).

NCDMF Stock Assessment Program External Peer Review

Assessment Information

Assessment Species: Spotted seatrout (*Cynoscion nebulosus*)
Stock Assessment Report: Stock Assessment of Spotted Seatrout, *Cynoscion nebulosus*, in Virginia and North Carolina Waters—2014
Date Sent: January 5, 2015

Dear Reviewer-

Thank you for agreeing to review the 2014 stock assessment of the Virginia-North Carolina spotted seatrout stock. The purpose of the external peer review process is to ensure that the assessment and results presented are scientifically sound and that decision makers are provided adequate advice. Peer reviewers are asked to address the terms of reference in the terms of reference report that follows. Please be as specific as possible in recording your comments and suggestions for revision and improvement. Any additional suggestions to improve the stock assessment are appreciated. Reviewers are also welcome to make comments directly in the assessment report using the Track Changes feature in Microsoft Word.

Please return this form, the terms of reference report, and any additional comments to laura.lee@ncdenr.gov. We would like to have your review by February 2, 2015. A copy of the final report will be provided after it has been presented to the North Carolina Marine Fisheries Commission.

Thank you,

Laura M. Lee
Senior Stock Assessment Scientist
North Carolina Division of Marine Fisheries

TERMS OF REFERENCE REPORT FOR EXTERNAL PEER REVIEW

Reviewer Information

Reviewer Name: Harry Blanchet
Business Mailing Address: La. Dept. of Wildlife & Fisheries, 2000 Quail Dr., Baton Rouge
LA 70808
Business E-Mail: hblanchet@wlf.la.gov
Business Phone: 225-765-2889

1) Evaluate the thoroughness of data evaluation and presentation including:

a) Justification for inclusion or elimination of available data sources

Good description of the rationale. However, as there were no FI IOA available for VA, it would have been informative if a sensitivity run could have been at least evaluated for development that included FD indices from both regions. There are ways to minimize the weaknesses of FD indices (that were well-described in the document), such as allowing catchability to change over time, using stanzas where fishing regulations were constant, etc. Given the high CV on the recreational harvest data from VA (and the implied low number of intercepts), there may have been no real information to be derived from that, but without a FI index, you must assume that the stock responds the same over the entire range.

b) Consideration of survey and data strengths and weaknesses (e.g., temporal and spatial scale, gear selectivities, sample size)

I found no major issues with the presentation, but for the “Project 915” data, it was not clear which data were used in derivation of the indices. For instance, there was note made of a change in duration of the net soaks in some areas. If CPUE is based on catch per hour per net, that would not be as significant an issue as if it were in catch per net. I could not find adequate description of the CPUE index to determine that this was done. I also did not see any discussion to determine if null catches were appropriately incorporated in the development of the indices. Expansion of that section of the report to better capture index development could be useful.

c) Calculation and standardization of indices and other statistics

Standardization of indices and derivation of values seemed appropriate in general. Some aspects could be clarified (see note for (b) above). Allowing unrestricted variation in catchability in the FI indices has the effect of increasing the ability of the model to fit the estimates by assigning the variation to the catchability factor. That has the potential to “explain away” a lot of real variation in the model. Variation in catchability in FI surveys should be constrained, or explained. The variations seen in this assessment are significant, and could have an impact on the outputs of the model.

- 2) Evaluate the adequacy, appropriateness, and application of data used in the assessment.

In general, data were substantial, adequate and appropriate for the assessment. As there were no FI IOA available for VA, consideration of a FD IOA should have been included in the evaluation of potential indices. Both recreational and commercial data are available, and while both have significant issues, incorporating those types of data is a fairly common practice in similar stock assessments. If you have less confidence in them, you may have your final model without them, but they should be tested to see if they provide any additional information to the model, or more importantly, if they show some unexplained trend that is contrary to other data that may signal a different trend in that portion of the range. Given the relatively low harvest values, I do understand that there may not be much information there, but the effort should be made, and evaluation outlined. There was a mention made of collecting opercula for age determination. However there was no further discussion of whether these data were used in the assessment, or if there were any comparison between otolith and operculum-derived age estimates, if they were. If the reference was to collecting opercula of other species in that program, it needs to be re-stated for clarity. Brevity is appreciated, but there are no page charges here. I noted several places where a bit of expansion on the description of index derivation, etc. would have been useful.

I noted the very narrow SE given to the harvest value inputs to the model. As the reported PSE for MRIP data (as provided in the landings tables) is higher than the input variance, that input should be better explained in the text, or reconsidered in the model.

- 3) Evaluate the adequacy, appropriateness, and application of method(s) used to assess the stocks.

SS3 is becoming widely used in US assessments. However, it is extraordinarily difficult to create a model for a new species due to the many options available in the package. I give full credit to the assessment team for taking on this task. I would like to have seen some comparison of the results to those from the prior assessment, and some discussion of the changes found between them (having a continuity case would have been very nice, but would have required even more work).

- 4) Evaluate the methods used to estimate stock status determination criteria. Evaluate the adequacy and appropriateness of recommended stock status determination criteria.

Methods in general seem appropriate, consistent with generally accepted methods. Criteria also seem appropriate. Lack of S/R relationship is not unexpected in this species.

- 5) Does the stock assessment provide a valid basis for management for at least the next five years given the available data and current knowledge of the species stock dynamics and fisheries?

Yes

No

Comment on response.

In general, using the terminal year of an assessment for status determination may be a requirement, but the terminal estimates of stock size, and especially recruitment estimates, tend to change after those cohorts have a stanza or two exposed to the fisheries. As your only index of recruitment is relatively short, there will be additional likelihood of variation in those estimates of recruitment with more time and data.

- 6) Evaluate appropriateness of research recommendations. Suggest additional recommendations warranted, clearly denoting research and monitoring needs that may appreciably improve the reliability of future assessments.

In general, research recommendations are appropriate, and seem to be categorized in a reasonable order. Some of the recommendations were not clearly characterized in terms of the expected benefits to the stock management. Lack of a “true age validation” study noted in text but not in research recommendations. Also noted was lack of a fishery-independent index of abundance for Virginia stocks. While not a research recommendation per se, it would seem appropriate as a management consideration, at least to examine the potential for developing such. It need not be a monitoring program directed specifically at spotted seatrout, but could be more generalized but obtaining enough SST to provide FI data to future assessments. Non-traditional methods (acoustic surveys, etc.) may also be considered.

- 7) Are you aware of any reference material not cited in this report that should be included?

Information in section 1 related to life history, etc. did not seem to be updated since the last assessment to any degree. I saw VERY few references to literature after the 2008 assessment. I suggest removing sections 1.2 – 1.3 from future assessments into separate species profile document that can be updated independently.

- 8) Would you be willing to act as an external peer reviewer for a future NCDMF stock assessment?

Yes

No

- 9) Do you have any additional comments?

I would strongly encourage use of additional tables of input data (actual indices of abundance, age sample distribution by fishery and year, CAA, etc.). It makes the process more transparent. I appreciate the numerous graphics, but they do not replace tables. Lacking those tables of input values, inclusion of the SS input file may have helped, but unless the reviewer is comfortable with those files, that may not help. I also made notes in the body of the document, to clarify or highlight notes in this review.

NCDMF Stock Assessment Program External Peer Review

Assessment Information

Assessment Species: Spotted seatrout (*Cynoscion nebulosus*)
Stock Assessment Report: Stock Assessment of Spotted Seatrout, *Cynoscion nebulosus*, in Virginia and North Carolina Waters—2014
Date Sent: January 5, 2015

Dear Reviewer-

Thank you for agreeing to review the 2014 stock assessment of the Virginia-North Carolina spotted seatrout stock. The purpose of the external peer review process is to ensure that the assessment and results presented are scientifically sound and that decision makers are provided adequate advice. Peer reviewers are asked to address the terms of reference in the terms of reference report that follows. Please be as specific as possible in recording your comments and suggestions for revision and improvement. Any additional suggestions to improve the stock assessment are appreciated. Reviewers are also welcome to make comments directly in the assessment report using the Track Changes feature in Microsoft Word.

Please return this form, the terms of reference report, and any additional comments to laura.lee@ncdenr.gov. We would like to have your review by February 2, 2015. A copy of the final report will be provided after it has been presented to the North Carolina Marine Fisheries Commission.

Thank you,

Laura M. Lee
Senior Stock Assessment Scientist
North Carolina Division of Marine Fisheries

TERMS OF REFERENCE REPORT FOR EXTERNAL PEER REVIEW

Reviewer Information

Reviewer Name: Christopher J. McDonough
Business Mailing Address: SCDNR, 217 Fort Johnson Rd. Charleston, SC 29412
Business E-Mail: mcdonoughc@dnr.sc.gov
Business Phone: (843)953-9231

1) Evaluate the thoroughness of data evaluation and presentation including:

a) Justification for inclusion or elimination of available data sources

Were there any instate surveys (for both NC and VA) that were considered for the assessment that were not included? I'm wondering about NCDMF Survey program 195 (Pamlico Sound Survey) and possibly some of the long term Chesapeake surveys (CHESMMAP, VIMS striped bass juvenile seine survey, etc). I would like to know what surveys (if any) were not included and why.

b) Consideration of survey and data strengths and weaknesses (e.g., temporal and spatial scale, gear selectivities, sample size)

The coverage of areas, data types (FD and FI) and the particular strengths and weaknesses, given how the data was examined through the different indices, seemed adequately covered.

c) Calculation and standardization of indices and other statistics

I think using the GLM standardization worked well. While there are other more expansive models and techniques, keeping the standardization as simple as possible while retaining fewer steps between standardization for the model and the actual raw data provides a better view of what may be really happening. I do have a question on how the Program 915 data was broken up into 4 different indices. I would expect a degree of collinearity with these indexes, why do it that way as opposed to using a single index with season as a covariate and then running the different seasons as sensitivity runs in the model?

2) Evaluate the adequacy, appropriateness, and application of data used in the assessment.

Data used in the model appear to be appropriate as well as treatment and standardization procedures.

3) Evaluate the adequacy, appropriateness, and application of method(s) used to assess the stocks.

The methods used and the descriptions of how they were used in the applied Stock Synthesis model appeared detailed and appropriate for the different data types and followed the accepted procedures for how this method should be carried out. Not being a modeler in a strict sense, I think the stock synthesis model worked well with this data but don't feel I can

comment on whether some other models (VPA, Statistical Catch at Age, etc) might have been appropriate as well. However, I do feel that the method used was a good fit.

- 4) Evaluate the methods used to estimate stock status determination criteria. Evaluate the adequacy and appropriateness of recommended stock status determination criteria.

The stock status threshold criteria, as set out by the FMP, seem to work with the variability in recruitment, SSB, and F levels during the time of the assessment. The absence of any clear long term trends and the fact that the estimates of SSB were well below both the threshold and target SPR levels indicate the model outputs are reasonable as is the conclusion that the stock was not being overfished. F levels were a bit closer to the reference and target levels (at the 20% and 30% levels) but the high degree of variability in natural mortality owing to both recruitment variability and susceptibility to winter cold kill events likely exacerbate general F levels and the actual levels of F are probably lower. So, the conclusion that the stock is not experiencing overfishing seems reasonable.

- 5) Does the stock assessment provide a valid basis for management for at least the next five years given the available data and current knowledge of the species stock dynamics and fisheries?

Yes

No

Comment on response.

I would agree with this but as the authors state, further work on getting better estimates of natural mortality are needed.

- 6) Evaluate appropriateness of research recommendations. Suggest additional recommendations warranted, clearly denoting research and monitoring needs that may appreciably improve the reliability of future assessments.

Current recommendations cover all of the areas that would be helpful for improving the assessment in the future. The only thing I might add (as a medium priority) would be genetic studies across NC and VA and comparisons with work done in the rest of the south Atlantic.

- 7) Are you aware of any reference material not cited in this report that should be included?

SC has not published a citable age validation for spotted seatrout, however, we have extensive age data and have on occasion produced what amounts to one for some other work.

- 8) Would you be willing to act as an external peer reviewer for a future NCDMF stock assessment?

Yes

No

9) Do you have any additional comments?

One issue I would bring up more for future consideration rather than as part of this assessment is the issue of hybridization amongst *Cynoscion* species. This topic came up during the ongoing weakfish assessment and appears to be more of an issue in GA and FL, however there is some evidence of *C. nebulosis* and *C. regalis* hybrids from the SEAMAP program. This is ongoing work that I am not directly involved with, but it is information that is good to know. I do believe they are currently working on a publication on this topic.

NCDMF Stock Assessment Program External Peer Review

Assessment Information

Assessment Species: Spotted seatrout (*Cynoscion nebulosus*)
Stock Assessment Report: Stock Assessment of Spotted Seatrout, *Cynoscion nebulosus*, in Virginia and North Carolina Waters—2014
Date Sent: January 5, 2015

Dear Reviewer-

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Please return this form, the terms of reference report, and any additional comments to laura.lee@ncdenr.gov. We would like to have your review by February 2, 2015. A copy of the final report will be provided after it has been presented to the North Carolina Marine Fisheries Commission.

Thank you,

Laura M. Lee
Senior Stock Assessment Scientist
North Carolina Division of Marine Fisheries

TERMS OF REFERENCE REPORT FOR EXTERNAL PEER REVIEW

Reviewer Information

Reviewer Name: Michael Murphy
Business Mailing Address: FWC-FWRI, 100 Eighth Ave SE, St. Petersburg, FL 33701
Business E-Mail: mike.murphy@myfwc.com
Business Phone: 727-502-4928

1) Evaluate the thoroughness of data evaluation and presentation including:

a) Justification for inclusion or elimination of available data sources

It may be important to extend the data back in time to develop more contrast in the estimated size of the stock. Though I couldn't find the outputs needed to calculate the initial depletion (virgin SSB and SSB_1991), if most of the depletion occurred before the start of the analysis that would hamper your efforts to estimate MSY-based reference points.

As you discussed, I think it's important to find a way to link the natural mortality to cold-weather events, probably through an environmental link in the parameter. It might be necessary to do away with the Lorenzen and go to a simpler two-state natural mortality for this to work correctly.

I believe the MRIP total catch data may be a valid index of abundance, especially if you treat it with a random-walked catchability as you did for the fishery-independent indices.

b) Consideration of survey and data strengths and weaknesses (e.g., temporal and spatial scale, gear selectivities, sample size)

I am not convinced that it is necessary to break the gill-net survey into seasonal and area components to create multiple indices. Why not include these variables in the standardization if you think they may influence the catch-rate signal used as the index of abundance?

Is the within-year spatial scale (two months) of the yoy trawl data too short? You mention the effect of salinity on spawning activity and, though salinity can be included in standardization, isn't it important to include the more complete period of yoy recruitment?

c) Calculation and standardization of indices and other statistics

This is well thought out and complete.

2) Evaluate the adequacy, appropriateness, and application of data used in the assessment.

Major issues are the random walk component of the fishery independent index catchability and the lack of change in natural mortality over time. It seems that the random walk would dilute (or eliminate) any guidance from the indices as to changes in abundance. The prime example is the large yoy index in 2012, where a large increase in catchability renders this

signal as an actual decrease in yoy abundance. I assume this is because the raw index conflicts with the age-0 catch, fishery selectivity, and F for the last year's data.

The use of constant natural mortality (despite direct tag evidence for large fluctuations) likely makes the estimates of F during cold-kill years highly positively biased. The change in estimated abundance from year-to-year correctly implies a high Z but this can only be mostly attributed to F given the constant M.....then given an input level of harvest, the estimated abundance implied by this catch and abundance must be biased low.

The discrepancy between the tag-measured F's and the SS3 F's weren't large in 2011 (Fig 3.36) but the observed and predicted numbers recaptured was quite different. Is there a good explanation for this?

- 3) Evaluate the adequacy, appropriateness, and application of method(s) used to assess the stocks.

I think the SS3 platform choice is a good one though its flexibility can make understanding the implications of different inputs scenarios very challenging.

- 4) Evaluate the methods used to estimate stock status determination criteria. Evaluate the adequacy and appropriateness of recommended stock status determination criteria.

The methods used are correct though I believe the biases created by the constant M assumption would lead to a stock status determination that was probably worse than what actually is occurring in nature.

- 5) Does the stock assessment provide a valid basis for management for at least the next five years given the available data and current knowledge of the species stock dynamics and fisheries?

Yes

No

Comment on response.

My only caveat is that periodic mass mortalities have the potential to lead to population bottlenecks where added protections might be wise to let the population recover. I don't see anything in the SSB trajectory that suggests this problem occurred during the fairly frequent freeze events in the 1990's and 2000's.

- 6) Evaluate appropriateness of research recommendations. Suggest additional recommendations warranted, clearly denoting research and monitoring needs that may appreciably improve the reliability of future assessments.

A clear area of research should be to evaluate and develop methods to incorporate periodic natural mortalities into the analysis. This would be research activity because it is not clear how this can be done. It might also be nice to use simulation analyses to determine whether some buffer to the SPR threshold of 20% is necessary to keep the population at these levels under the current periodicity of freeze-induced spikes in M.

7) Are you aware of any reference material not cited in this report that should be included?
There is information on gill-net release mortality in Murphy et al. 1995.

8) Would you be willing to act as an external peer reviewer for a future NCDMF stock assessment?

Yes

No

9) Do you have any additional comments?

I concentrated on the base runs and did not evaluate the sensitivities or retrospective but they were clearly presented in the text.



North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

Donald R. van der Vaart
Secretary

MEMORANDUM

TO: N.C. Division of Marine Fisheries Management Review Team

FROM: Beth Egbert and Kevin Brown
N.C. Division of Marine Fisheries

DATE: March 9, 2015

SUBJECT: Plan Development Team Recommendation from Kingfish Fishery Management Plan Review

On Jan. 7, 2015 the Kingfish Fishery Management Plan (FMP) Plan Development Team (PDT) met at the Washington Regional Office to discuss the ongoing review of the Kingfish FMP. A primary purpose of the meeting was to discuss and consider if any refinement should be made to the prior management triggers included in the 2007 Kingfish FMP. While the PDT selected updated and improved triggers expanding the reference timeframe through 2013, the team did not think these changes alter the basic strategic concept of the trigger management set forth by the 2007 FMP. The consensus of the PDT on the outcome of the FMP review was to recommend a revision.

The Kingfish PDT met again Jan. 15, 2015 to finalize their management trigger recommendations and discuss and clarify the definition of tripping of management triggers. The PDT recommended reducing the number of triggers from 10 to seven, and specified that any two triggers would have to be tripped for two sequential years, the same two triggers, for data to be reevaluated and potential management action to be considered.

On Jan. 20, 2015, Beth Egbert and Laura Lee presented the PDT analysis of management triggers along with the PDT recommendation to proceed with a revision to the Division Management Review Team (MRT.) The MRT agreed with the PDT recommendation to proceed with a revision, but recommended that the language be changed regarding the criteria for management action from “management action ‘would’ be considered” to “management action ‘may’ be considered.” The MRT consensus was to proceed with the news release soliciting issues from the public for the Kingfish FMP review.

To alert the public that the Kingfish FMP was under review and to solicit public input on potential issues, a news release was issued Jan. 26, 2015. The deadline for comment by the public was Feb. 17, 2015. The PDT received five comments. Each comment was reviewed by the PDT and a response to each comment was drafted (see enclosed.) Only one of the five comments requested any changes to regulations for kingfishes.

On Feb. 25, 2015, the Kingfish PDT met via conference call to discuss the public comments and whether or not any of the comments warranted an issue paper or an amendment instead of a revision to the plan. The PDT was notified by the FMP Process Workgroup that the term “revision” is now called an “information update” and refers to only changes in factual and background information, not management measures.

After careful consideration of the FMP and the public comments, the Kingfish PDT recommends to the MRT that the Kingfish FMP review should proceed as an information update and that the public comments, and Division responses to the comments, will be included as an appendix to the FMP.

cc: Plan Development Team for Kingfish Fishery Management Plan

/be

Enclosure

Goals and Objectives

The goal of the 2007 Kingfish Fishery Management Plan is to determine the status of the stock and ensure the long-term sustainability for the kingfishes stock in North Carolina.

Objectives:

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

Evaluation of Management Triggers for Kingfish

November 2014
Updated January 2015

Laura Lee
Ray Mroch
Will Smith

BACKGROUND

Current management triggers for kingfish are organized into three groups: biological monitoring, fisheries-dependent catch per unit effort (CPUE), and fisheries-independent surveys. The triggers within each group are listed below:

Biological Monitoring

Mean fish length by fishery compared to last five years

Proportion of age one kingfishes greater than 50% of fish 11.0 to 11.8" TL

Fisheries-Dependent CPUE

Commercial < 2/3 of the mean harvest from 1999 to 2004

Recreational < 2/3 of the mean harvest from 1999 to 2004

Fisheries-Independent Surveys—Juvenile and Adult

Pamlico Sound fall 2/3 below mean CPUE

Southeast Area Monitoring and Assessment Program (SEAMAP) fall 2/3 below mean CPUE

If one of the management triggers is “tripped” then the NCDMF will consider management action.

EVALUATION

The first issue that needs clarification is whether the triggers apply to southern kingfish only or all kingfish species separately or combined (see Follow Up section).

It is not clear how the indicator related to mean length by fishery will be judged. It simply states that it will be compared to the average length from the previous five years, but it does not specify what constitutes a good or bad result. It will be assumed that the intention was that a decrease in average length relative to the previous five years will trip the trigger.

It is expected that the average age of a fish population decreases with increasing fishing pressure because fewer fish survive to old age (Francis and Smith 1995; Francis and Jellyman 1999). Since age is often highly correlated with length it is not unreasonable to assume that average length would decrease with decreasing biomass; however, this is not always the case (Francis and Smith 1995). Additionally, natural variations in recruitment can cause substantial variation in annual average length, even when fishing pressure is constant (Francis and Jellyman 1999). For these reasons, evaluation of average length alone may not be appropriate.

Since tracking average length is considered (incorrectly) an index of the fraction of the population that survives to relatively older ages, it might be more appropriate to identify another metric based on length frequencies that is expected to more accurately track the relative abundance of older fish. The loss of larger, presumably older fish from the population is expected to produce a signal in the tails of the length distribution rather than the center of the distribution; thus, some index that accounts for the tails of the annual length-frequency distribution is more appropriate. For example, if no fish greater than a certain size are observed for five years, that might be a management trigger. The same logic could be applied to age distributions in order to identify another trigger based on ages; however, if age samples are collected in a less random way with respect to length data collection, length data may be more accurate.

The triggers based on fisheries-dependent CPUE indices are not clear. As stated, the triggers suggest they will be tripped if the CPUE index is less than 2/3 of the average harvest from 1999 to 2004. It is assumed that the intention was that the trigger would be tripped if the CPUE index is less than 2/3 of the average CPUE index from 1999 to 2004.

Fisheries-dependent indices are associated with numerous biases. Relative indices are assumed to be proportional to stock size. In order for a fisheries-dependent index to be proportional to abundance, fishing effort must be random with respect to the distribution of the population and catchability must be constant over space and time. This is one of the benefits of fisheries-independent surveys for use as indices of abundance—they are designed to provide unbiased estimators and employ a standard methodology over time and space. Other factors affecting the proportionality of fisheries-dependent indices to stock size include changes in fishing power, gear selectivity, gear saturation and handling time, fishery regulations, gear configuration, fishermen skill, market prices, discarding, vulnerability and availability to the gear, distribution of fishing activity, seasonal and spatial patterns of stock distribution, changes in stock abundance, and environmental variables. Additionally, it is often difficult to define a standard unit of effort for fisheries-dependent data. Many agencies, including the NCDMF, don't require fishermen to report records of positive effort with zero catch; lack of these "zero catch" records in the calculation of indices can introduce further bias. Furthermore, fisheries-dependent indices are, at most, only reflective of trends in fished areas and apply only to individuals within the size range that is capable of being caught by the fishing gear. Both fisheries-dependent and fisheries-independent indices can be standardized to account for factors other than changes in abundance that affect the indices (Maunder and Punt 2004). This requires the collection of auxiliary data at the time of harvest or sampling event. Often, such data are not available for fisheries-dependent indices. Finally, fisheries-dependent indices tend to exhibit hyperstability (Harley 2001); that is, the CPUE index remains high while the population declines.

A further issue related to the recreational fishery CPUE index is the recent change in methodology that occurred in 2013 (see <http://www.st.nmfs.noaa.gov/recreational-fisheries/index>). Accounting for this change in the computation of the recreational fishery CPUE index will be a difficult task, if possible at all.

As mentioned above, fisheries-independent indices can be standardized to account for factors beyond abundance changes that impact the index. Other considerations for fisheries-independent

survey series include length of time series, survey design, consistency in methodology, catchability and availability to the gear, sample timing and spatial coverage, and precision. The minimum length for a survey index to be considered sufficient is the average lifespan of the species. Southern kingfish live approximately nine years so the Pamlico Sound Survey index is considered of adequate length (twenty-four years). The survey is based on a sound statistical design, so survey design is not thought to be an issue. There have been some changes in methodology over time; this can be accommodated by limiting the time series to those years in which the methods have been consistent. For the Pamlico Sound Survey, this would be from 1990 forward. Sample timing is not thought to be an issue as southern kingfish have been caught in the June and September components during every year of the survey. Spatial coverage is an issue as the southern kingfish extends beyond North Carolina waters.

Catchability and availability are more difficult to assess. One way this can be evaluated is by looking at the percentage of tows in which the species does not occur (“zero” tows). Consistently high proportions of tows with zero catch can indicate that there is low catchability and/or availability. The percentage of zero tows was calculated for southern kingfish observed in the Pamlico Sound Survey for both the June and September components of the survey. In many years the percentage of zero tows exceeds 60% for June (Table 1). The average number of zero tows per year for June is 59% and the average for September is 49%. A closer look at the data shows that there are three strata (‘NR’, ‘PR’, ‘PUN’) in which southern kingfish are infrequent or rare (Tables 2, 3). The calculation of an index based on these survey data could consider eliminating data collected from these strata. Alternatively, one could consider applying a zero-inflated model when constructing the index.

Precision is easily evaluated by computing the standard error associated with the annual index. A stratified-GLM approach was used to calculate standardized indices for June and September. The standard errors and proportional standard errors (PSEs) were also calculated. Most statistical texts recommend a PSE of 20% or less. The PSEs of the June and September indices are shown in Figures 1 and 2. PSE values exceed 20% in all but three years for the June index and all but one year for the September index. Elimination of the three strata suggested above may lead to improved precision.

RECOMMENDATION (accepted by PDT 1/7/2015)

Based on the evaluation, it is recommended that consideration of management action should not be based on any one trigger alone but some combination of two or more triggers. Management triggers based on average length should not be considered; instead a trigger based on the upper tail of the length and/or age distribution should be developed. Another recommendation is to eliminate the fisheries-dependent CPUE indices as management triggers. Finally, the Pamlico Sound Survey index should be computed for June and September separately and should not include data collected in the ‘NR’, ‘PR’, or ‘PUN’ strata.

JANUARY 2015 FOLLOW UP

The Kingfish PDT met on Wednesday, January 7 to discuss several issues including the evaluation of management triggers. Upon further review of prior plan and stock assessment report text, the recommendations put forward in this document, and review of the full time series of data through 2013, the PDT during its discussion accepted this report’s initial

recommendations and made further refinements. Additionally, the PDT clarified that management triggers apply to southern kingfish. The PDT decided on the following management triggers (organized into three categories; see PDT minutes for 1/7/2015):

Biological Monitoring

Proportion of adults \geq length at 50% maturity (L_{50}) for NCDMF Program 195 June

Proportion of adults $\geq L_{50}$ for NCDMF Program 915

Proportion of adults $\geq L_{50}$ for SEAMAP summer

→ If the proportion of adults $\geq L_{50}$ falls below 2/3 of the average proportion of adults $\geq L_{50}$ for the time series, then the trigger will be considered tripped.

Fisheries-Independent Surveys—Juvenile and Adult

NCDMF Program 195 September index of YOY relative abundance

SEAMAP summer index of adult relative abundance

SEAMAP fall index of YOY relative abundance

→ If a fisheries-independent survey falls below 2/3 of the average abundance for the time series (through 2013), then the trigger will be considered tripped.

Other

Relative fishing mortality rate (F)

→ If relative F rises above 66% of the average relative F for the time series (through 2013), the trigger will be considered tripped.

If any two triggers trip two years in a row (regardless of category), then data will be reevaluated and management action may be considered.

DETAILS

Peak spawning for southern kingfish occurs in April so data collected by the NCDMF during March and April were used to estimate the maturity schedule. The value for L_{50} was estimated using the standard logistic maturity curve (males and females pooled) and the estimate was 210 mm total length (TL; Figure 3). Adults collected during the June component of the Program 195 survey (excluding strata NR, PR, and PUN) were considered individuals > 150 mm TL. For the July through September component of Program 915 (Pamlico Sound deep strata only), adults were defined as individuals > 190 mm TL. For the summer component of the SEAMAP (Onslow, Raleigh, and Long bays, inner—shallow—strata) survey, adults were considered individuals > 150 mm TL.

Defining cut-offs for YOY and adults for the fisheries-independent surveys varied by survey and season. For the September component of the Program 195 survey (excluding strata NR, PR, and PUN), YOY were defined as individuals ≤ 190 mm TL. For the summer component of the SEAMAP (Onslow, Raleigh, and Long bays, inner—shallow—strata) survey, adults were defined as above (>150 mm TL). For the fall component of the SEAMAP (Onslow, Raleigh, and Long bays, inner—shallow—strata) survey, YOY were considered individuals ≤ 205 mm TL.

The relative index derived from the Program 195 survey was calculated using a stratified GLM approach. The indices derived from the SEAMAP survey were computed using standard (non-stratified) GLMs.

Relative F is a simple method for estimating trends in F (Sinclair 1998). It is estimated as catch divided by a fisheries-independent index of relative abundance. Here, catch (commercial landings plus recreational harvest) was divided by the SEAMAP spring index (Onslow, Raleigh, and Long bays, inner—shallow—strata) of relative abundance.

RESULTS

The management triggers based on the proportions of adults $\geq L_{50}$ are shown in Figures 4 through 6. The proportions of adults $\geq L_{50}$ derived from the NCDMF Program 915 survey were above the trigger threshold in all years throughout the respective time series (Figure 5). The management triggers based on the fisheries-independent survey indices are shown in Figures 7 through 9. The management trigger based on relative F is shown in Figure 10.

In 17 of the 27 years (1987–2013), at least one trigger was tripped in each of two categories (Table 4). There were eight instances when two triggers simultaneously tripped two years in a row (regardless of category). No triggers were tripped in 2013.

DISCUSSION AND PDT RECOMMENDATIONS

The management triggers adopted in the 2007 Kingfish FMP were evaluated and recommendations were put forth in this document to improve and refine those triggers. Based on the evaluation of the newly proposed management triggers, consideration of management action is not warranted at this time. The results indicated that no triggers were tripped in 2013.

REFERENCES

- Francis, R.I.C.C., and D.J. Jellyman. 1999. Are mean size data adequate to monitor freshwater eel fisheries? *Marine and Freshwater Research* 50(4):355–366.
- Francis, R.I.C.C., and D.C. Smith. 1995. Mean length, age, and otolith weight as potential indicators of biomass depletion for orange roughy, *Hoplostethus atlanticus*. *New Zealand Journal of Marine and Freshwater Research* 29(4):581–587.
- Harley, S.J., R.A. Myers, and A. Dunn. 2001. Is catch-per-unit-effort proportional to abundance? *Canadian Journal of Fisheries and Aquatic Sciences* 58(9):1760–1772.
- Maunder, M.N., and A.E. Punt. 2004. Standardizing catch and effort data: a review of recent approaches. *Fisheries Research* 70(2-3):141–159.
- Sinclair, A.F. 1998. Estimating trends in fishing mortality at age and length directly from research survey and commercial catch data. *Canadian Journal of Fisheries and Aquatic Sciences* 55(5):1248–1263.

Table 1. Percentage of zero tows for southern kingfish occurring in the June and September components of the NCDMF Pamlico Sound Survey, 1990–2013.

Year	June	September
1990	79.6	45.1
1991	90.6	43.4
1992	64.2	59.6
1993	51.9	81.1
1994	69.8	44.9
1995	73.6	28.8
1996	63.5	81.1
1997	62.3	69.8
1998	88.5	66.7
1999	70.4	55.8
2000	50.9	47.2
2001	67.9	49.1
2002	71.7	48.1
2003	75.5	54.7
2004	57.4	43.4
2005	65.4	44.2
2006	42.6	46.3
2007	45.1	29.6
2008	50.0	44.4
2009	44.4	38.9
2010	24.1	51.9
2011	63.0	31.5
2012	20.4	46.3
2013	27.8	24.1

Table 2. Percentage of tows in which southern kingfish were present in the June component of the NCDMF Pamlico Sound Survey by strata, 1990–2013.

Year	NR	PDE	PDW	PR	PSE	PSW	PUN
1990	0	18	56	0	33	0	0
1991	0	4.5	13	0	29	33	0
1992	0	42	63	0	50	40	0
1993	0	76	44	0	71	25	0
1994	0	40	50	0	38	25	0
1995	0	36	29	0	43	25	0
1996	0	48	57	0	43	50	0
1997	20	64	29	0	17	40	0
1998	0	15	13	0	33	0	0
1999	0	26	30	0	57	80	0
2000	0	74	44	0	71	60	0
2001	0	53	45	0	14	33	0
2002	20	32	33	0	43	40	0
2003	0	30	36	0	50	0	0
2004	0	50	40	20	86	50	0
2005	0	53	44	0	50	20	0
2006	40	60	67	0	100	60	33
2007	0	78	44	20	83	60	33
2008	60	50	33	40	71	60	33
2009	0	65	44	40	86	100	0
2010	60	90	89	0	100	100	0
2011	20	60	22	0	43	40	0
2012	80	95	100	0	86	80	33
2013	20	85	89	40	86	100	0

Table 3. Percentage of tows in which southern kingfish were present in the September component of the NCDMF Pamlico Sound Survey by strata, 1990–2013.

Year	NR	PDE	PDW	PR	PSE	PSW	PUN
1990	0	70	60	0	86	100	0
1991	20	68	83	0	88	50	0
1992	0	60	0	0	75	100	0
1993	20	24	11	20	14	33	0
1994	0	79	57	20	83	50	0
1995	20	95	75	0	86	100	33
1996	20	14	13	0	67	25	0
1997	20	50	33	0	29	0	0
1998	20	39	33	0	63	33	0
1999	0	58	50	20	86	0	0
2000	0	95	10	0	100	33	0
2001	0	84	44	0	71	40	0
2002	0	95	44	0	29	50	33
2003	0	68	20	0	71	75	33
2004	0	70	56	40	86	75	0
2005	20	65	33	20	100	100	33
2006	0	65	56	40	71	80	0
2007	20	95	67	40	71	100	0
2008	20	60	56	20	86	100	0
2009	0	90	67	0	57	100	0
2010	0	45	67	40	71	60	33
2011	0	95	78	0	71	100	33
2012	20	85	44	20	43	40	33
2013	0	100	88	20	100	100	0

Table 4. Summary of management trigger organized by category. Bold values indicate values that exceed (and so would trip) the trigger.

Year	BIOLOGICAL MONITORING			FISHERIES-INDEPENDENT SURVEYS			OTHER
	Proportion of Adults >= L50			YOY Indices		Adult Index	Relative F
	Program 195 June	Program 915	SEAMAP Summer	Program 195 September	SEAMAP Fall	SEAMAP Summer	Relative F
1987	0.602			0.538			
1988	0.450			0.926			
1989	0.300		0.585	1.31	10.5	7.63	17,627
1990	0.529		0.463	2.35	9.93	29.1	92,209
1991	0.667		0.894	3.45	9.92	41.7	31,107
1992	0.429		0.622	1.37	5.20	15.7	25,449
1993	0.542		0.456	0.106	4.70	14.2	59,442
1994	0.794		0.917	5.07	11.3	3.10	137,621
1995	0.440		0.486	8.60	2.36	11.1	49,097
1996	0.872		0.780	0.208	9.77	5.44	30,411
1997	0.576		0.373	0.452	4.00	11.0	20,276
1998	1.00		0.769	0.207	10.6	5.65	9,743
1999	0.920		0.608	3.79	22.6	28.0	24,813
2000	0.733		0.929	8.21	8.31	11.6	83,334
2001	0.660	0.983	0.303	4.42	5.15	25.6	20,962
2002	0.704	0.978	0.882	6.30	14.2	11.9	31,765
2003	0.860	0.978	0.645	5.81	4.24	18.5	5,706
2004	0.513	0.963	0.284	2.98	13.2	45.0	5,579
2005	0.594	0.970	0.643	1.52	11.0	18.1	5,530
2006	0.541	0.979	0.423	20.4	5.55	23.7	13,604
2007	0.338	1.00	0.521	8.97	6.59	8.42	45,254
2008	0.480	0.987	0.577	8.79	9.56	3.99	41,046
2009	0.591	1.00	0.398	24.9	3.75	16.2	33,941
2010	0.508	0.981	0.786	1.47	16.9	11.9	20,169
2011	0.447	1.00	0.507	16.8	31.3	21.1	31,533
2012	0.523	1.00	0.368	5.02	9.22	61.9	8,052
2013	0.659	0.941	0.558	16.9	10.7	39.5	4,048

Threshold	0.402	0.654	0.394	3.97	6.68	13.1	22,396
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Total Years	27	13	25	27	25	25	25
n Exceed	2	0	4	14	9	11	14

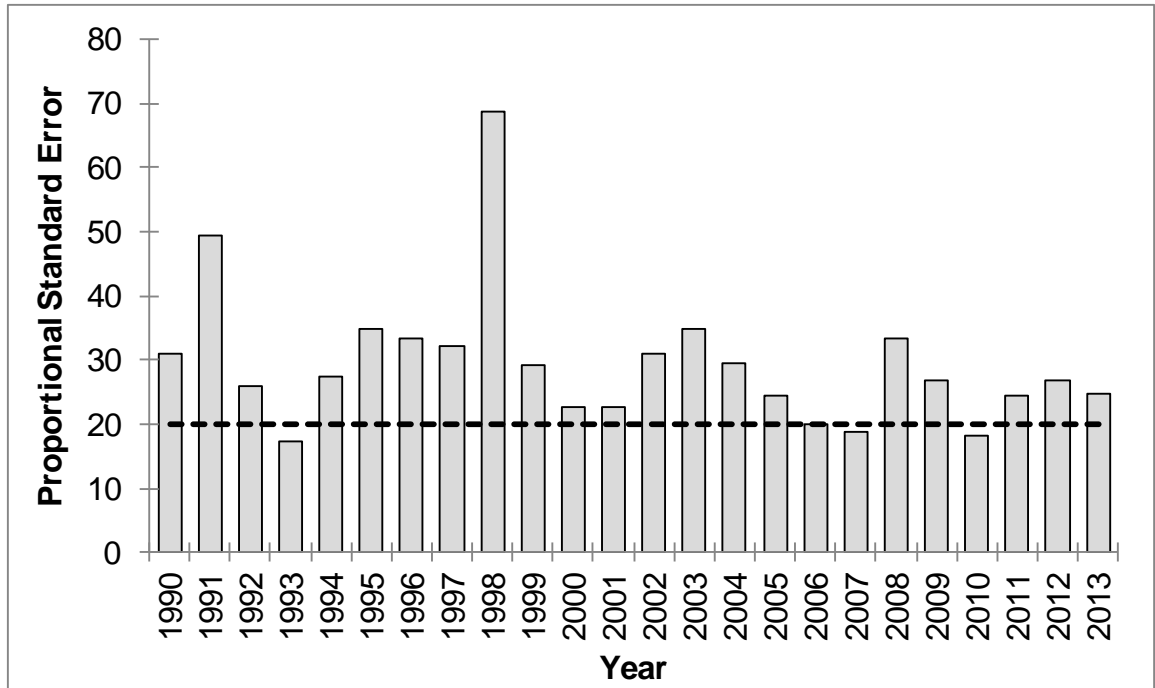


Figure 1. Annual PSE values associated with the GLM-standardized index of southern kingfish occurring in the June component of the Pamlico Sound Survey, 1990–2013. Dotted line represents 20% PSE.

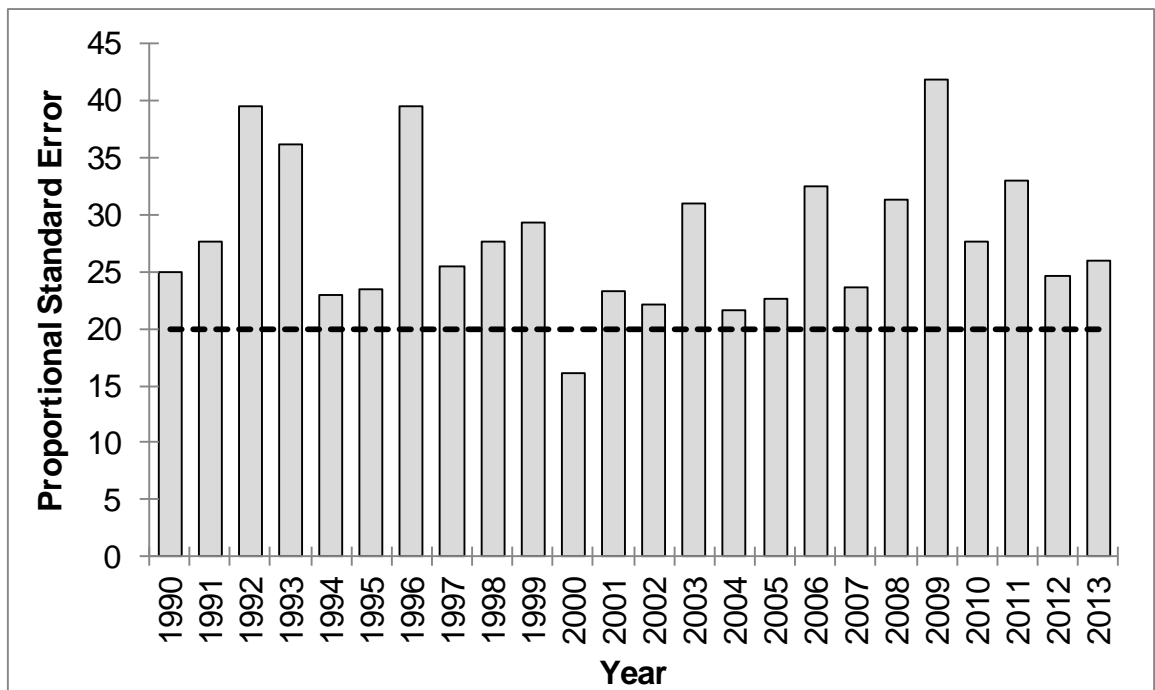


Figure 2. Annual PSE values associated with the GLM-standardized index of southern kingfish occurring in the September component of the Pamlico Sound Survey, 1990–2013. Dotted line represents 20% PSE.

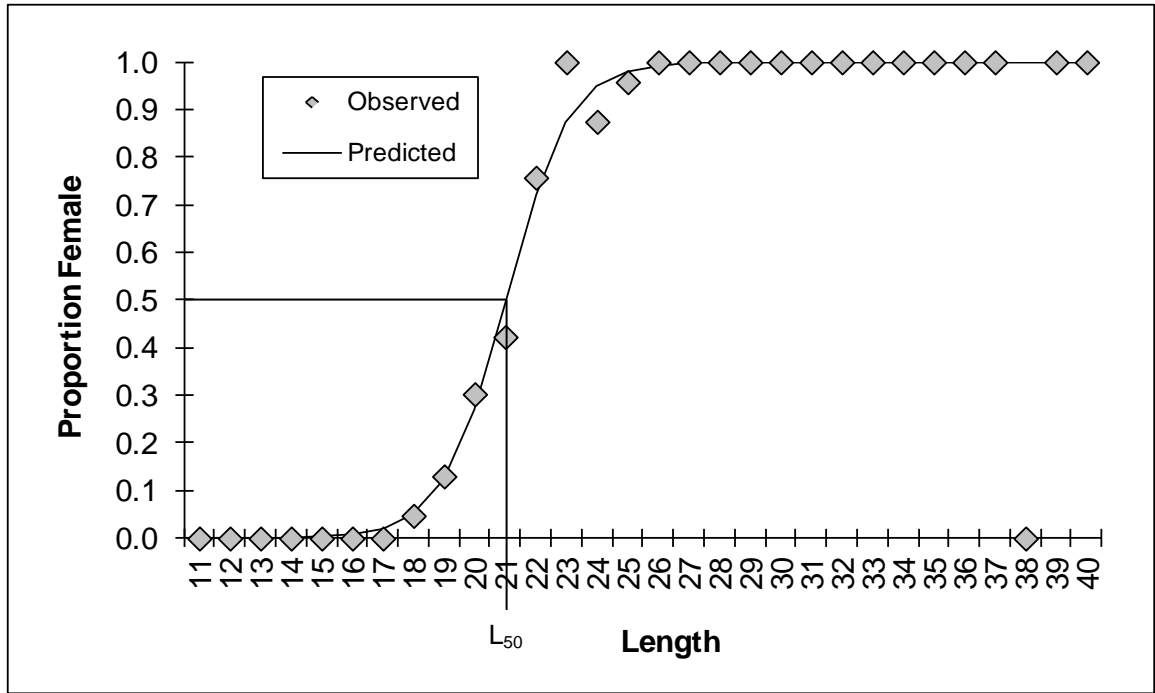


Figure 3. Predicted maturity schedule for male and female (pooled) southern kingfish.

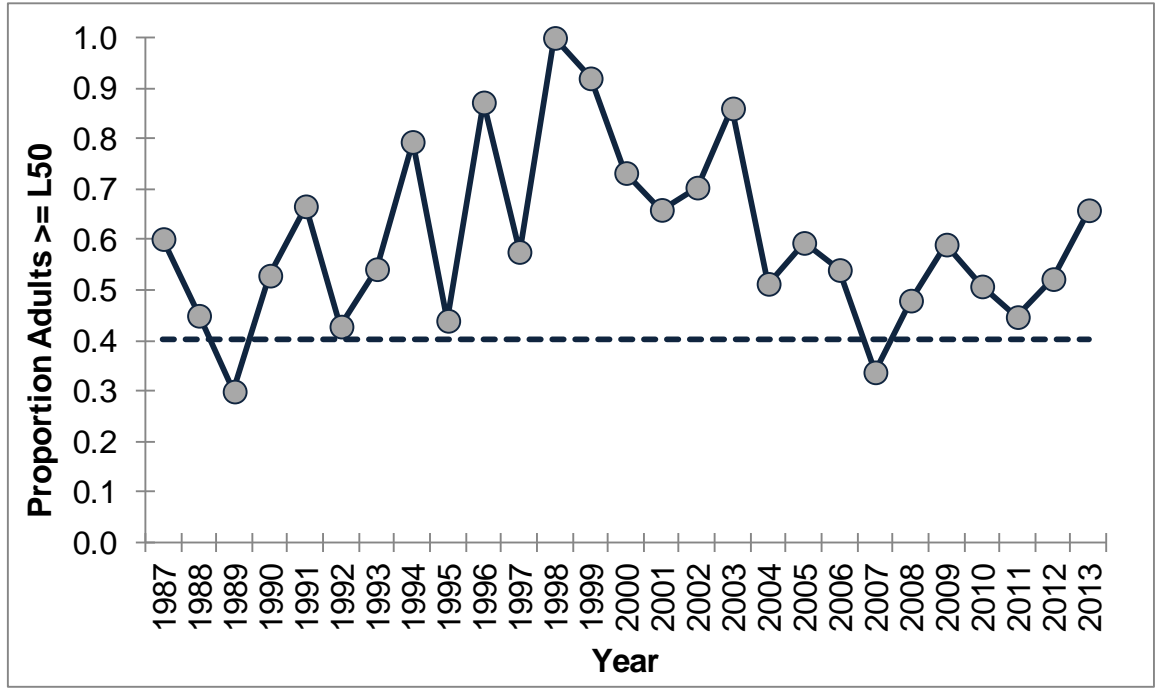


Figure 4. Annual proportions of adults greater than or equal to the length at 50% maturity occurring in the June component of the NCDMF Program 195 survey (excluding strata NR, PR, and PUN), 1987–2013. Dotted line represents 2/3 of the average of the time series.

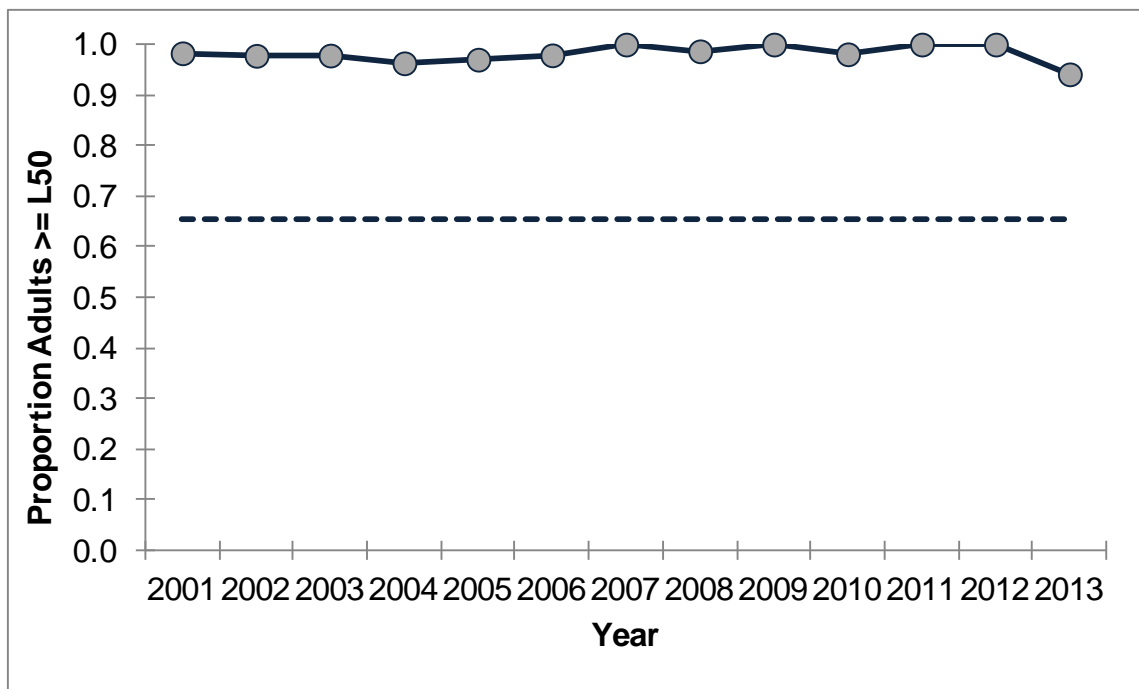


Figure 5. Annual proportions of adults greater than or equal to the length at 50% maturity occurring in the July–September component of the NCDMF Program 915 survey (Pamlico Sound deep strata only), 2001–2013. Dotted line represents 2/3 of the average of the time series.

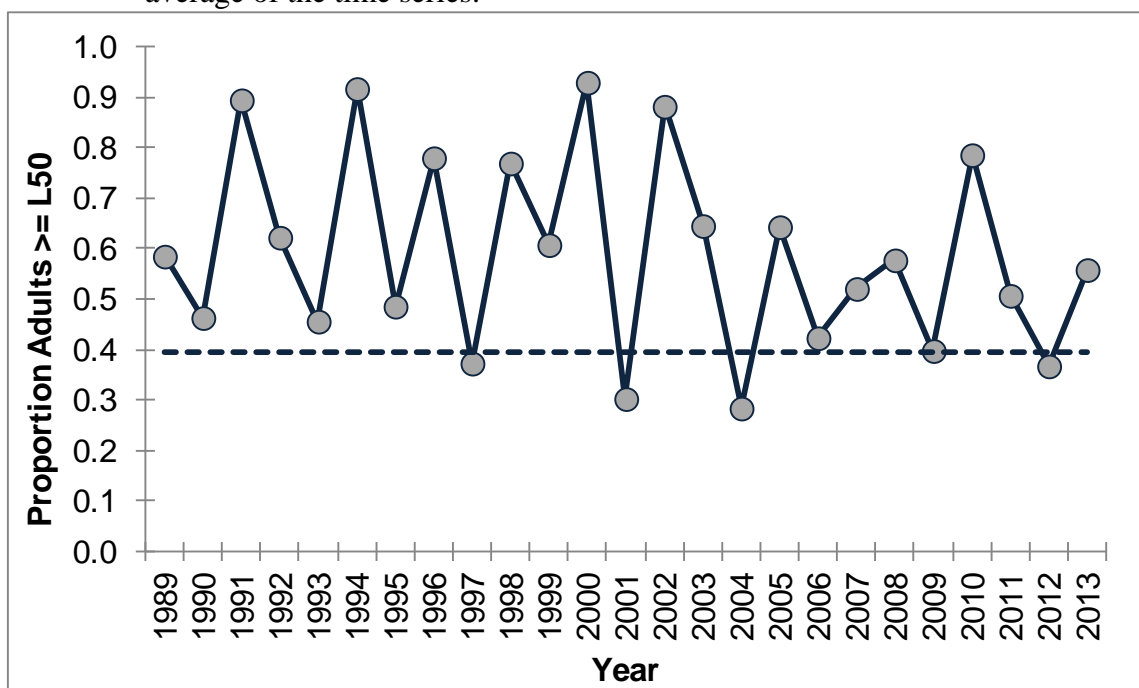


Figure 6. Annual proportions of adults greater than or equal to the length at 50% maturity occurring in the summer component of the SEAMAP survey (Onslow, Raleigh, and Long bays, inner–shallow–strata), 1989–2013. Dotted line represents 2/3 of the average of the time series.

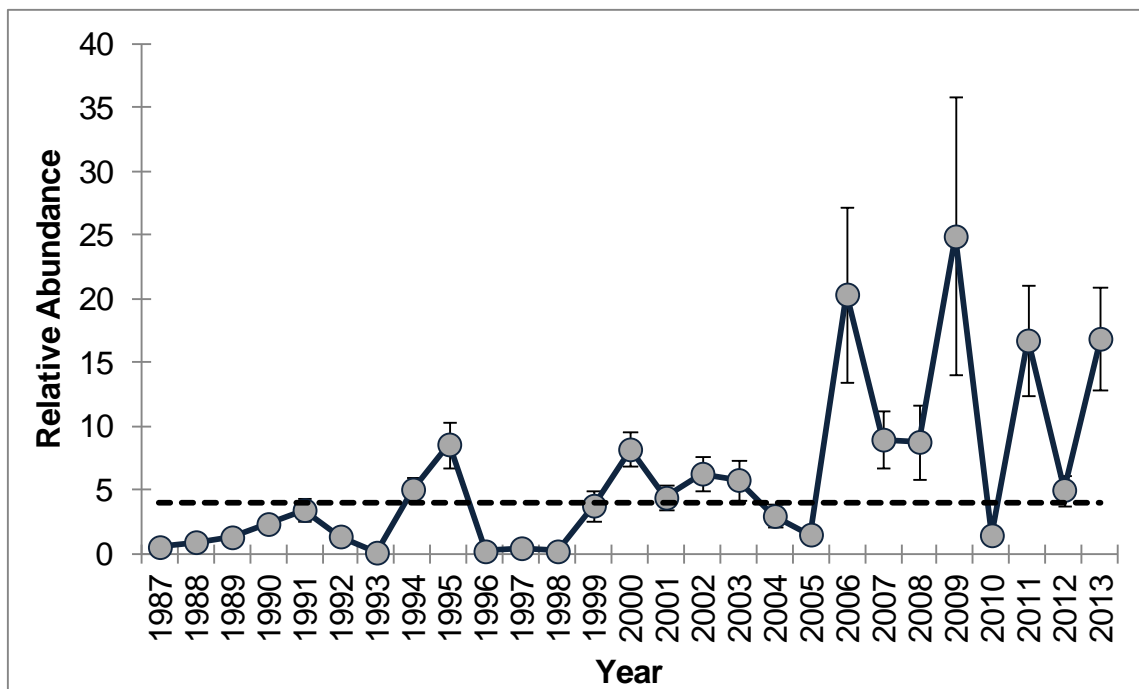


Figure 7. Annual index of relative YOY abundance derived from the September component of the NCDMF Program 195 survey (excluding strata NR, PR, and PUN), 1987–2013. Dotted line represents 2/3 of the average of the time series.

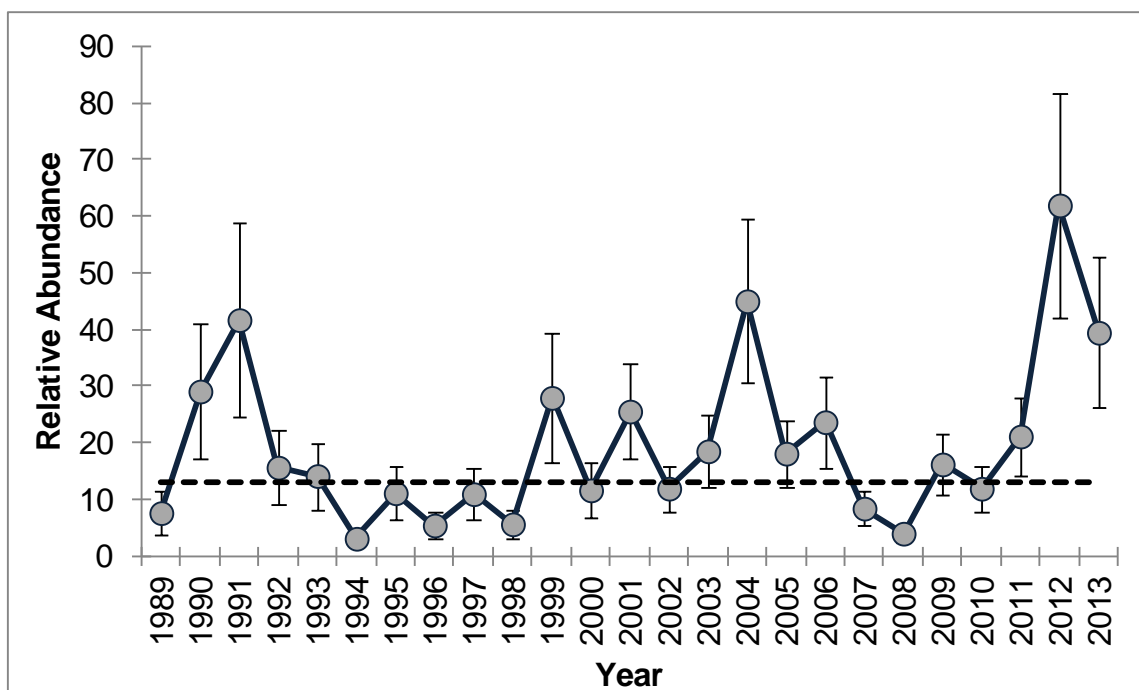


Figure 8. Annual index of relative adult abundance derived from the summer component of the SEAMAP survey (Onslow, Raleigh, and Long bays, inner—shallow—strata), 1989–2013. Dotted line represents 2/3 of the average of the time series.

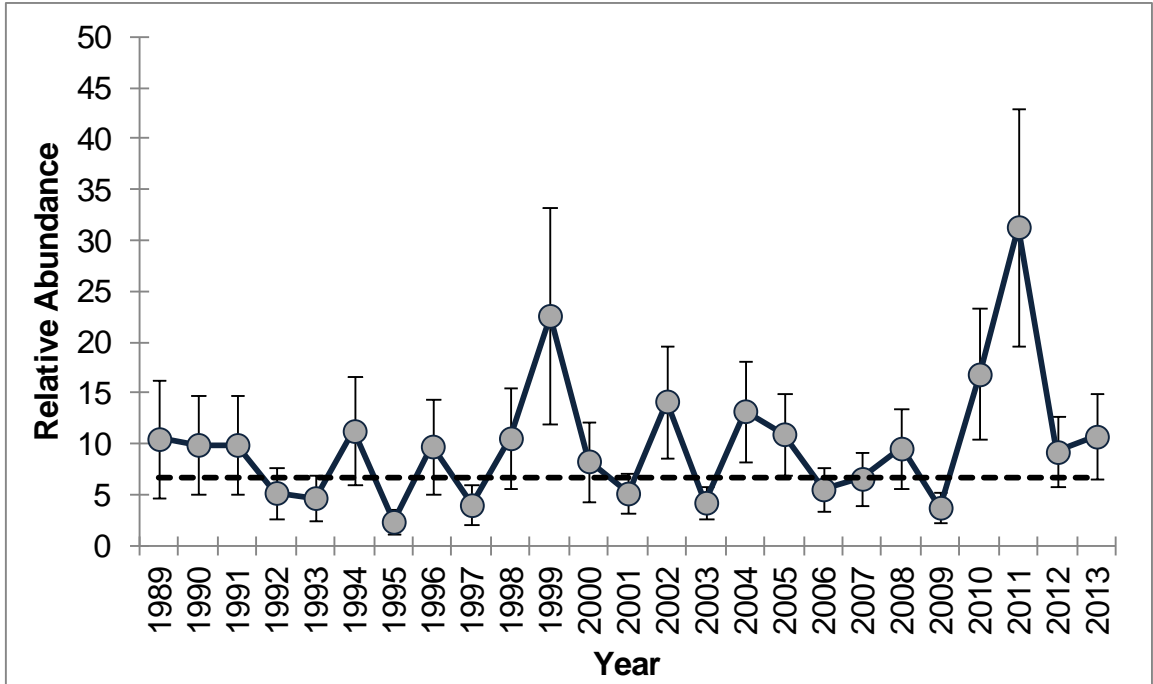


Figure 9. Annual index of relative YOY abundance derived from the fall component of the SEAMAP survey (Onslow, Raleigh, and Long bays, inner—shallow—strata), 1989–2013. Dotted line represents 2/3 of the average of the time series.

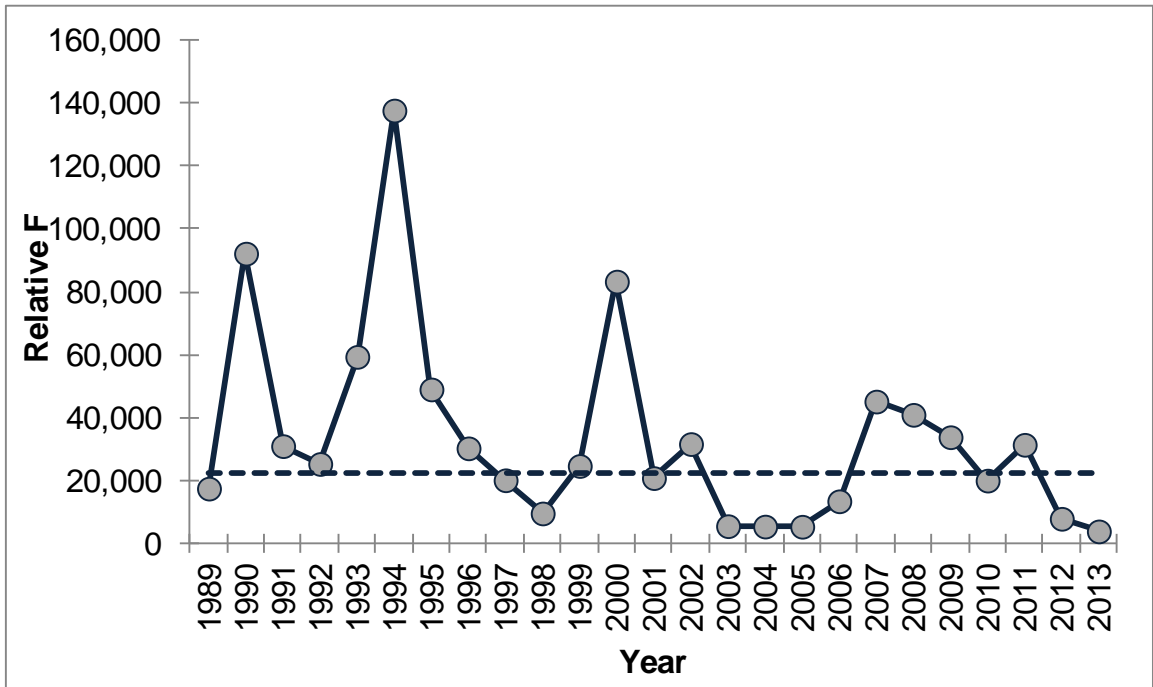


Figure 10. Annual estimates of relative fishing mortality rate, 1989–2013. Dotted line represents 66% of the average of the time series.

TIMELINE FOR KINGFISH FISHERY MANAGEMENT PLAN (FMP) REVIEW 2014
(Feb. 24, 2015)

MILESTONES	DMF GUIDELINES	TABLE 2 STEP	PROJECTED COMPLETION DATE
1. Activate plan development team, co-leads, mentor	V. D.	37 a.	August 2013
2. Review management unit, goal and objectives	II. D.	2	September 2013
3. Assess updated FMP data	V. D.	37 b.	December 2014
4. Assess whether any FMP management measures need to be changed or new issues addressed *	V. D.	37 f.	March 2015
5. Review and update all sections of FMP	V. D.	37 e.	April-June 2015
6. Present timeline and results of FMP review to Marine Fisheries Commission	III. D.	7	May 21, 2015
7. Present FMP information update to Marine Fisheries Commission	III. F.	14	Aug. 20, 2015
8. Post FMP information update on website for 30 days	III. F.	16-18	September 2015
9. Present FMP information update to MFC for final approval	IV. C.	19	Nov. 19, 2015
10. If FMP information update is approved, post on website	IV. C.	38A	December 2015
11. If information update is not approved and management changes are proposed, proceed with amendment process	V. D.	38B	December 2015

* For FMP review, a press release is issued soliciting public comment on fishery issues.

Initial approval by director Date: 4/22/15

Signature: 

Timeline revised by director Date: _____

Signature: _____

Reason(s): _____

Public Input for Kingfish FMP review 2015

News Release distributed Jan. 26, 2015

MOREHEAD CITY – The N.C. Division of Marine Fisheries is asking the public to submit comments on issues they would like to see addressed in an upcoming Kingfish Fishery Management Plan. State law requires the division to review each fishery management plan every five years

The division has begun a mandated review of the N.C. Kingfish Fishery Management Plan that was adopted by the N.C. Marine Fisheries Commission in 2007. The agency is soliciting public comment as part of an internal process to determine what procedural method to take in reviewing the plan.

If changes in management strategies or rules are needed, the division will pursue a plan amendment, where division staff and an advisory committee develop positions on specific issues that need to be addressed. If changes in management strategies are not required, the division will proceed with a revision, which is a more abbreviated process that involves updating data and fishery information contained in the plan.

Written comments will be accepted until February 17 and should be addressed to Beth Egbert, N.C. Division of Marine Fisheries, P.O. Box 1965, Manteo, N.C. 27954 or sent by email to Beth.Egbert@ncdenr.gov or to Kevin Brown, N.C. Division of Marine Fisheries, P.O. Box 769, Morehead City, N.C. 28557 or sent by email to Kevin.H.Brown@ncdenr.gov.

State law requires the division to prepare a fishery management plan for adoption by the Marine Fisheries Commission for all commercially and recreationally significant species or fisheries that comprise state marine and estuarine resources. These plans provide management strategies designed to ensure long-term viability of the species.

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From the Public

Email received Jan. 26, 2015 from Dan Wood

I would like to see the state put a size limit on Kingfish (whiting). Right now thousands and thousands of small whiting are killed before they have a chance to reach eating size by netters as well as by both commercial and recreational fishermen. By putting a size limit on them they would at least reach spawning size before they can legally be taken.

Thanks for your consideration,

Dan Wood

Lexington, NC

e-mail: woodjd@lexcominc.net

phone: 336-239-2315

Division Response

The management strategy set forth under the 2007 Kingfish Fishery Management Plan is the use of management triggers where management actions may be considered based on trends in several indices (biological and fishery independent). Indices have been updated through 2013 and based on these the Division has determined there is no need for additional regulations for kingfish at this time. A size limit would increase regulatory discards of kingfishes. Some culling occurs at sea and has been documented in the shrimp trawl fishery off South Carolina (DMF unpublished data). Placing a nine-inch or greater size limit on kingfishes, which are bycatch in several fisheries, would result in additional regulatory discards in the shrimp trawl, long haul seine, beach seine, sciaenid pound net, winter trawl, and recreational fisheries as well as the gill net fishery. Heads of kingfishes are also used as bait in the recreational red drum fishery. Under North Carolina law, it is unlawful to possess aboard a vessel or while engaged in fishing from the shore or a pier any species of finfish that is subject to a size or harvest restriction without having head and tail attached (Marine Fisheries Commission Rule 15A NCAC 03M .0101).

The Division is not proposing any changes in management strategies or measures for the N.C. Kingfish Fishery Management Plan. Changes in factual and background data will be documented in the upcoming Information Update to the plan. The Marine Fisheries Commission will be advised of this at its May 2015 business meeting in New Bern. The commission is scheduled to vote on final approval of the Information Update to the fishery management plan at its November 2015 business meeting in Nags Head. Thank you for your interest in the State's fisheries.

N.C. Kingfish Fishery Management Plan 2007

http://portal.ncdenr.org/c/document_library/get_file?uuid=3882c28f-da09-4978-93ab-13ba38eb0414&groupId=38337

Email received Jan. 26, 2015 from Frank Folb (Northern Regional AC)

The Sea Mullet fishery is very important to both recreational and commercial fisherfolks.

Sea Mullet was in the olden days what brought families to the Outer Banks to fish to help feed their families.

Still today it is a highly sought after fish that is of high priority to fishing piers and surf fisherman along our coast and our neighboring states above and below us.

Because these fish are NOT a highly sought after species on recreational boats I suggest that little or no limits for recreational fisheries as to size and creel be made.

If a minimum size limit is considered it should no more 9-10 inches and the creel for recreational should be no less than 50-75 fish.

Commercial Limits

In the past we have gone to historical data to see what the largest catch of a fish was and given them at least that amount for a top limit of catch for the year.

If I am correct that at present the fishery is viable and healthy I suggest we at least double any historical high for the beginning limit. This fishery is very important to the commercial sector in recent years and fills in a void when many other fisheries are closed. Until there is a need by research that a daily limit is needed I suggest no limit be placed on amount of catch per day or seasons open.

I would appreciate your reactions to my suggestions and also would include me on what your scientific committee minutes so I can follow and be involved throughout its implementation.

Thanks

Frank Folb

Northern Advisory Committee

Frank & Fran's Tackle

Avon, NC

Division Response

The management strategy set forth under the 2007 Kingfish Fishery Management Plan is the use of management triggers where management actions may be considered based on trends in several indices (biological and fishery independent). Indices have been updated through 2013 and based on these the Division has determined there is no need for additional regulations for kingfish at this time. Currently, the only regulation for kingfishes in North Carolina relates to shrimp and crab trawls from December 1 through March 31. During this time it is unlawful to possess finfish caught incidental to shrimp and crab trawling in the Atlantic Ocean unless the weight of the combined catch of shrimp and crabs exceeds the weight of finfish; except that an additional 300 pounds of kingfish may be taken by crab or shrimp trawlers working south of Bogue Inlet [Marine Fisheries Commission Rule 15A NCAC 03J .0202 (5)].

The Division is not proposing any changes in management strategies or measures for the N.C. Kingfish Fishery Management Plan. The upcoming Information Update will contain the most recent data to characterize the fishery and species of kingfish. The Marine Fisheries Commission will be advised of this at its May 2015 business meeting in New Bern. The commission is scheduled to vote on final approval of the Information Update to the fishery management plan at its November 2015 business meeting in Nags Head. Thank you for your interest in the State's fisheries.

N.C. Kingfish Fishery Management Plan 2007

http://portal.ncdenr.org/c/document_library/get_file?uuid=3882c28f-da09-4978-93ab-13ba38eb0414&groupId=38337

Email received Jan. 27, 2015 from Glenn Shivar

Hello! I have a few comments that I would like to express concerning sea mullet, aka kingfish.

--Are regulations really necessary? In my small part of the coast they seem larger and more numerous than I have seen and I'm 66 yrs old.

-- Make the creel limit generous, at least 30 / person.

-- Have no length requirement. Often used as bait. Big drum in the surf and for large flounder.

Thank You and have a Great Day - Glenn Shivar

Division Response

The management strategy set forth under the 2007 Kingfish Fishery Management Plan is the use of management triggers where management actions may be considered based on trends in several indices (biological and fishery independent). Indices have been updated through 2013 and based on these the Division has determined there is no need for additional regulations for kingfish at this time. Currently, the only regulation for kingfishes in North Carolina relates to shrimp and crab trawls from December 1 through March 31. During this time it is unlawful to possess finfish caught incidental to shrimp and crab trawling in the Atlantic Ocean unless the weight of the combined catch of shrimp and crabs exceeds the weight of finfish; except that an additional 300 pounds of kingfish may be taken by crab or shrimp trawlers working south of Bogue Inlet [Marine Fisheries Commission Rule 15A NCAC 03J .0202 (5)].

The Division is not proposing any changes in management strategies or measures for the N.C. Kingfish Fishery Management Plan. The upcoming Information Update will contain the most recent data to characterize the fishery and species of kingfish. The Marine Fisheries Commission will be advised of this at its May 2015 business meeting in New Bern. The commission is scheduled to vote on final approval of the Information Update to the fishery management plan at its November 2015 business meeting in Nags Head. Thank you for your interest in the State's fisheries.

N.C. Kingfish Fishery Management Plan 2007

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Email received February 12, 2015 from Chris McCaffity

Public Comments Regarding Kingfish Management

I am Chris McCaffity. Please keep an open mind as you think about these solutions that could be applied to managing most seafood including kingfish and herring.

Start by deciding how many kingfish their existing habitat can support. Establish reasonable recreational/charter and consumer/commercial quotas. Allow stakeholders to decide how each sector's annual quotas will be managed with a 2/3 majority vote from participating permit/license holders. Stock kingfish in rotation with other species as needed to support desired harvest levels. Take practical steps to enhance habitat so our waters can support more marine life. Reward fishermen and consumers with higher quotas as stocks reach desired levels. Process scraps from cleaned seafood into aquaculture feed.

Hatcheries and habitat enhancement could be the perfect union of mariculture and wild-caught seafood that lives free and self-sufficient until harvested. Stocked species would thrive and produce at Optimum Yield even as we harvest more. These proven solutions would feed more people while creating more recreational opportunity and generating more revenue. It is time to focus more on enhancing our fisheries than restricting access to them.

Thank you for your thoughtful consideration of these positive solutions. I am happy to answer any questions. freefish7@hotmail.com

Division Response

The management strategy set forth under the 2007 Kingfish FMP is the use of management triggers where management actions may be considered based on trends in several indices (biological and fishery independent). Indices have been updated through 2013 and based on these the Division has determined there is no need for additional regulations for kingfish at this time. Currently, the only regulation for kingfishes in North Carolina relates to shrimp and crab trawls from December 1 through March 31. During this time it is unlawful to possess finfish caught incidental to shrimp and crab trawling in the Atlantic Ocean unless the weight of the combined catch of shrimp and crabs exceeds the weight of finfish; except that an additional 300 pounds of kingfish may be taken by crab or shrimp trawlers working south of Bogue Inlet [15A NCAC 3J .0202 (5)].





The Division is not proposing any changes in management strategies or measures for the N.C. Kingfish Fishery Management Plan. The upcoming Information Update will contain the most recent data to characterize the fishery and species of kingfish. The Marine Fisheries Commission will be advised of this at its May 2015 business meeting in New Bern. The commission is scheduled to vote on final approval of the Information Update to the fishery management plan at its November 2015 business meeting in Nags Head. Thank you for your interest in the State's fisheries.

NC Fishery Management Plan Kingfish 2007

http://portal.ncdenr.org/c/document_library/get_file?uuid=3882c28f-da09-4978-93ab-13ba38eb0414&groupId=38337

Email received Feb. 16, 2015 from Adam Tyler

I would like to offer these comments on the proposed Kingfish FMP review. According to the DMF website these fish are fine. As noted in the copy and paste below from the DMF website. Commercial landing did decline in 2013 but I firmly believe that was due to the arrival of spiny dogfish in the region. Dogfish tend to eat what is available and run schools of fish out of the area. When this occurs obviously these fish leave the area. However this year 2014 was a banner year for all 3 species of Kingfish. We have caught them locally up to Super Bowl Sunday. The lack of large schools of Spiny Dogfish this year allowed us to catch king fish till later than normal due to natural predators being minimal this year. So I do not feel that any changes are currently needed in this plan. [Mr. Tyler also gave additional comments by phone concerning his interest in a correlation between dogfish abundance and kingfish abundance. He stated that he gillnets for both and when one is abundant the other is not. He asked if it would be possible for the division to investigate a correlation based on landings or other data (Kevin Brown personal communication.)]

Comments						
	<table border="1"><tr><td></td><td></td><td></td><td></td><td>A state fishery management plan completed in 2007 indicated a healthy age structure in the stock along with increasing trends in</td></tr></table>					A state fishery management plan completed in 2007 indicated a healthy age structure in the stock along with increasing trends in
				A state fishery management plan completed in 2007 indicated a healthy age structure in the stock along with increasing trends in		

Kingfishes (A)

juvenile abundance, but commercial landings dropped in 2013.

Adam Tyler

Division Response

The management strategy set forth under the 2007 Kingfish Fishery Management Plan is the use of management triggers where management actions may be considered based on trends in several indices (biological and fishery independent). Indices have been updated through 2013 and based on these the Division has determined there is no need for additional regulations for kingfish at this time. Currently, the only regulation for kingfishes in North Carolina relates to shrimp and crab trawls from December 1 through March 31. During this time it is unlawful to possess finfish caught incidental to shrimp and crab trawling in the Atlantic Ocean unless the weight of the combined catch of shrimp and crabs exceeds the weight of finfish; except that an additional 300 pounds of kingfish may be taken by crab or shrimp trawlers working south of Bogue Inlet [Marine Fisheries Commission Rule 15A NCAC 03J .0202 (5)].

While it would be interesting to investigate a correlation in the abundance of dogfish and kingfish, the division does not feel it is necessary for the Informational Update to the Kingfish Fishery Management Plan at this time.

The Division is not proposing any changes in management strategies or measures for the N.C. Kingfish Fishery Management Plan. The upcoming Information Update will contain the most recent data to characterize the fishery and species of kingfish. The Marine Fisheries Commission will be advised of this at its May 2015 business meeting in New Bern. The commission is scheduled to vote on final approval of the Information Update to the fishery management plan at its November 2015 business meeting in Nags Head. Thank you for your interest in the State's fisheries.

N.C. Kingfish Fishery Management Plan 2007

http://portal.ncdenr.org/c/document_library/get_file?uuid=3882c28f-da09-4978-93ab-13ba38eb0414&groupId=38337

Draft Issue Paper
Determine Need For and Impacts of Sheepshead Size, Creel, and Trip Limits in North Carolina

Apr. 29, 2015

I. ISSUE

Determining if management measures are needed for sheepshead and how to evaluate options without traditional stock assessment reference points.

II. ORIGINATION

At its July 2014 North Carolina Division of Marine Fisheries (NCDMF) Management Review Team (MRT) meeting, the committee requested that staff update the existing issue paper on the implementation of the proclamation authority and investigate potential management measures that may or may not be implemented as safeguards for the North Carolina sheepshead population.

III. BACKGROUND

Management History:

The initial 2004 North Carolina Interjurisdictional Fishery Management Plan (IJFMP) incorporated reef fish, including sheepshead, in the plan management unit which was defined as fish stocks managed by the federal fishery management councils or the Atlantic States Marine Fisheries Commission (ASMFC). Under the IJFMP, sheepshead was incorporated as a species managed by the South Atlantic Fishery Management Council (SAFMC) within its Snapper Grouper Fishery Management Plan. Possession was restricted to the aggregate 20 fish creel limit and this measure was implemented by proclamation (via rule 15A NCAC 03M .0512), in accordance with the IJFMP policy to comply with regulations developed through federal fishery management plans. On April 16, 2012, sheepshead was formally removed from the SAFMC's Snapper-Grouper Fishery Management Unit in the Comprehensive Annual Catch Limit (Comp ACL) Amendment. Subsequently, North Carolina's proclamation authority for the management of sheepshead was invalidated because the species was no longer part of the IJFMP, nor was there a standalone state FMP for sheepshead.

At a November 2012 business meeting, the North Carolina Marine Fisheries Commission (NCMFC) requested that division staff develop an issue paper on providing proclamation authority for implementing size, bag limits, and trip limits for sheepshead. Staff prepared an issue paper for the regional and Finfish Advisory Committees that described the current trends in the fishery as well as the species life history. The regional and Finfish committees all recommended the same management option: proclamation authority allowing the full list of management tools stated in the proposed rule. Additional committee advice included more detailed analysis of existing biological data, conducting a stock assessment if possible, and soliciting public input on future management measures. The NCDMF recommended establishing proclamation authority for gear, time, season, area, size, bag, and trip to manage sheepshead and present the issue to Finfish and regional advisory committees to solicit public comment on specific management measures. At the November 13-15, 2013 Marine Fisheries Commission Business meeting, the commission approved Rule 15A NCAC 03M .0521 which specifies the Director's proclamation authority for sheepshead, including the ability to restrict time, area, means and methods, season, size, and quantity.

In May 2014 the ASMFC South Atlantic State/Federal Fisheries Management Board considered whether to manage sheepshead through the Interstate Fisheries Management Program. The board concluded it was best to let each state come up with their own management options due it being unclear whether sheepshead are a true migratory species and given the ASMFC limited resources and budget constraints. To date there is no plan for a coastwide stock assessment by the ASMFC and any formal stock assessment would have to come from each state agency, none of which appeared to have sufficient data sets to complete one. While the stock status of sheepshead is unknown, the stock appears to be healthy; however, there have been concerns that increased fishing pressure due to more restrictive regulations on other species may negatively impact the stock.

This paper serves to review the status of the sheepshead fishery in North Carolina and presents several management options for NCMFC's consideration.

Life History

Sheepshead (*Archosargus probatocephalus*) is a relatively large and long-lived member of the family Sparidae (Porgies). The species is greenish-gray to silvery in color, with five to seven distinct vertical black bars and an oval shaped laterally compressed, deep body. Sheepshead commonly attain a length of 20 -25 inches and a weight ranging from 5 to 15 pounds. Fish in the 20 to 25 pound range are occasionally landed in North Carolina (Manooch 1984). Sheepshead are generally found from inshore brackish waters to offshore around rock and hard substrate, like jetties, pilings, and other structure covered with barnacles, mussels, and oysters. They have medium sized mouths with strong incisors and molars for picking up and crushing shellfish and sea urchins. Sheepshead are found in coastal waters of the eastern United States year-round based on recreational catches. Their range is from Nova Scotia to Florida along the east coast of North America continuing on to the Gulf of Mexico southward to the south Atlantic waters off Rio de Janeiro. Recreational landings of sheepshead in North Carolina are typically lower during the late fall through early spring (November-April). The decrease in landings might represent a spawning migration to oceanic waters as the temperature cools in the fall (Tremain et al. 2001). While in coastal offshore waters during the winter and spring, adults spawn on reefs (McDonough et al. 2011). They are found in coastal waters, bays and estuaries, and are tolerant of low salinity brackish waters as well. The current world record is 21 pounds, 4 ounces and was caught in New Orleans, Louisiana on April 16, 1982 (IGFA 2014). The North Carolina state record is 19 pound, 6 ounces and was caught off Oregon Inlet in 1999.

Sheepshead exhibit rapid growth from ages zero to six and have been reported to reach up to 29 inches TL in North Carolina (~28 FL; Schwartz 1990). However, less than 50 percent of the individuals are sexually mature at age one (10 inches FL). At age two (12 inches FL) most females are mature, with all sheepshead being mature at age four (14-25 inches FL). A recent study in the Chesapeake Bay found that the age at which half of the individuals could spawn (L50) was 1.51 for males (~11 inches FL), and 1.62 for females (~10 inches FL; Ballenger 2011). Both males and females were 100 percent mature at approximately 13 and 14 inches FL, respectively. Ballenger (2011) also noted that on average sheepshead in the Chesapeake Bay region attained a larger maximum size and age as compared to their more southern counterparts; reaching a maximum age of 35, living 12 to 21 years longer than previously reported. Ballenger (2011) concluded that differences in the age and growth of sheepshead found in the Chesapeake Bay region and that of sheepshead south of Cape Hatteras suggest two distinct populations in Mid-Atlantic Bight.

In South Carolina there is evidence of earlier maturation as compared to sheepshead found in North Carolina and those in the Chesapeake Bay region, with 50 percent of males and females being mature by age one (~9 inches FL) and greater than 80 percent by age three (~12 inches FL; McDonough et al. 2011). All males were mature by age four (~15 inches FL) and all females by age five (~16 inches FL). In Louisiana sheepshead also appear to mature earlier with the majority of both sexes being mature by age two; with all males and females being mature by ages three and four, respectively (Render and Wilson 1992).

In addition to differences in regional growth and maturity, migration is thought to be limited. Migration patterns based on mark recapture studies have not documented large scale movements. One study in Florida documented movement towards inlets during the fall and winter showing a more east-west offshore flow pattern than a north-south migration (Tremain et al. 2001). A Georgia study documented a maximum distance travelled of 70 miles (Woodward et al. 2000).

Description of the Fishery (Coastwide)

Sheepshead are a highly sought after in both the recreational and commercial fishery along the Atlantic Coast (Figure 1). From 1981 to 2013, the average landings of sheepshead from the East Coast of the United States were 1.89 million pounds per year. The majority of the landings occurred in the recreational fishery, which averaged 84 percent of the total harvest or 1.34 million pounds. Since 2002, the commercial harvest has ranged from 182,894 pounds in 2013 to a high of 318,061 pounds in 2009.

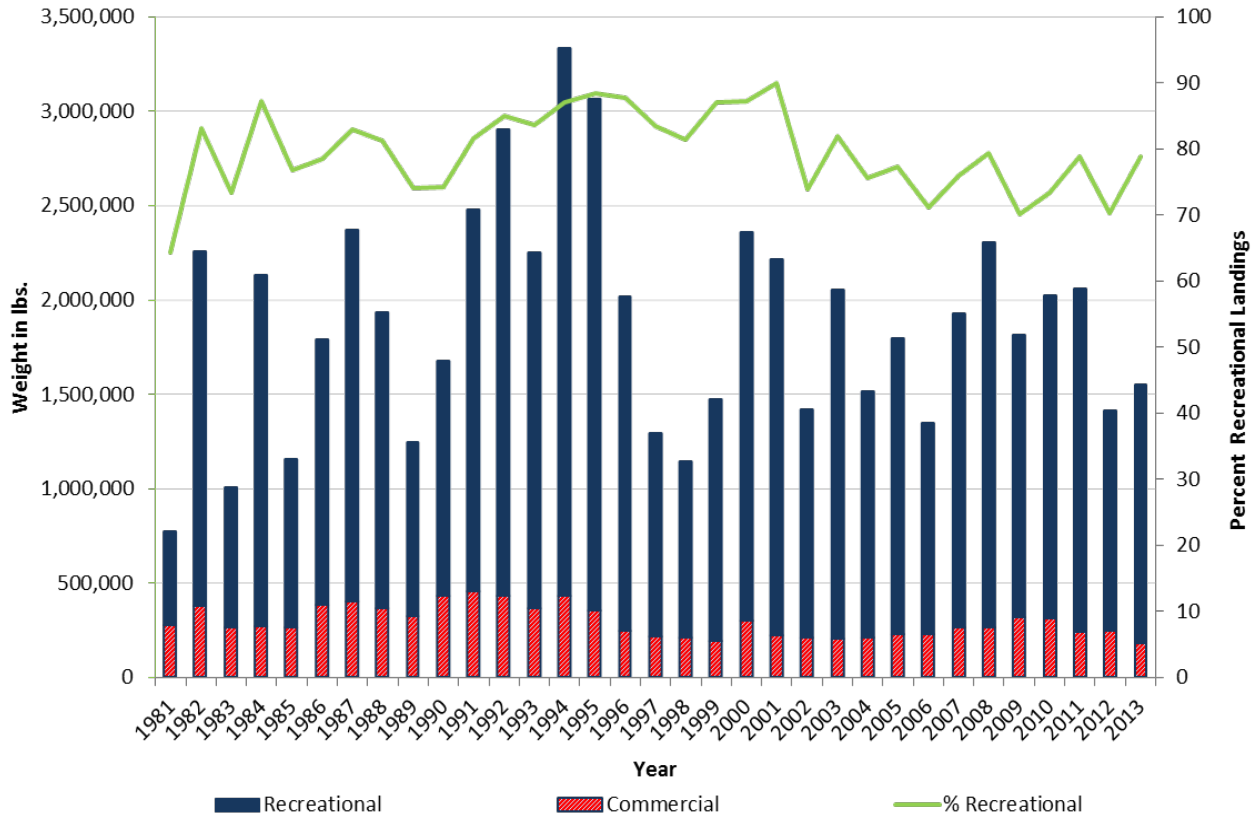


Figure 1. Recreational and commercial landings of sheephead from the Atlantic Coast from 1980 to 2013.

Florida, South Carolina and North Carolina fisheries comprise the majority of sheephead harvested recreationally along the Atlantic Coast. From 2002 to 2013, over 97 percent of the recreational harvest occurred in the South Atlantic (North Carolina, South Carolina, Georgia, and Florida). The recreational catch in Florida was highest on the East Coast every year except from 2007 to 2009 (Figure 2). On average, Florida harvests just below 50 percent of the recreational landings, accounting for 27 percent to as much 68 percent of the coastwide harvest annually. South Carolina ranked second in the highest total recreational landings from the South Atlantic from 2002 to 2013. Recreational landings in North Carolina have been highly variable, ranging from a low of 148,454 pounds in 2006 to a high of 725,623 pounds in 2007. North Carolina is the only state that saw an increase in the recreational landings in 2012 and 2013. This could be due in part to the fact that it was in 2012 that the bag limits were dropped by the ASMFC for both recreational bag limits and any commercial trip limits. Proportional standard errors (PSEs) for all years were below 15.5 except for in 2008 when the PSE was 21.1. The PSE expresses the standard error of an estimate as a percentage of the estimate and is a measure of precision. Catch estimates for commonly caught species, like sheephead, often are more precise than for rare event or pulse fisheries. PSE values greater than 50 indicate a very imprecise estimate.

The commercial harvest of sheephead along the Atlantic Coast is primarily from two states overall: Florida (54 percent) and North Carolina (31 percent) (Figure 3). Virginia, Georgia and South Carolina accounted for 3.5 percent of the total Atlantic Coast commercial harvest. The northern states provide less than 0.1 percent of the sheephead catch for the 12 year average. Florida has consistently harvested over 100,000 pounds for that same time period, averaging 152,349 pounds a year. Their four primary gears are cast nets, hook and line, diving spears and haul seines. From 2002 through 2008, North Carolina's landings varied averaging only 67,223 pounds a year, but since 2009, that average has increased to 140,239 pounds a year, a 73,000 pound or greater than 100 percent increase (Figure 3), again possibly due to the fact of no restrictions were in place. The popularity of sheephead has grown in North Carolina in the last five years, especially looking at specific gears used commercially to land sheephead.

North Carolina's leading commercial harvest gears have been gill nets, pound nets and haul seines. Use of gigs and spear fishing gear are also increasing.

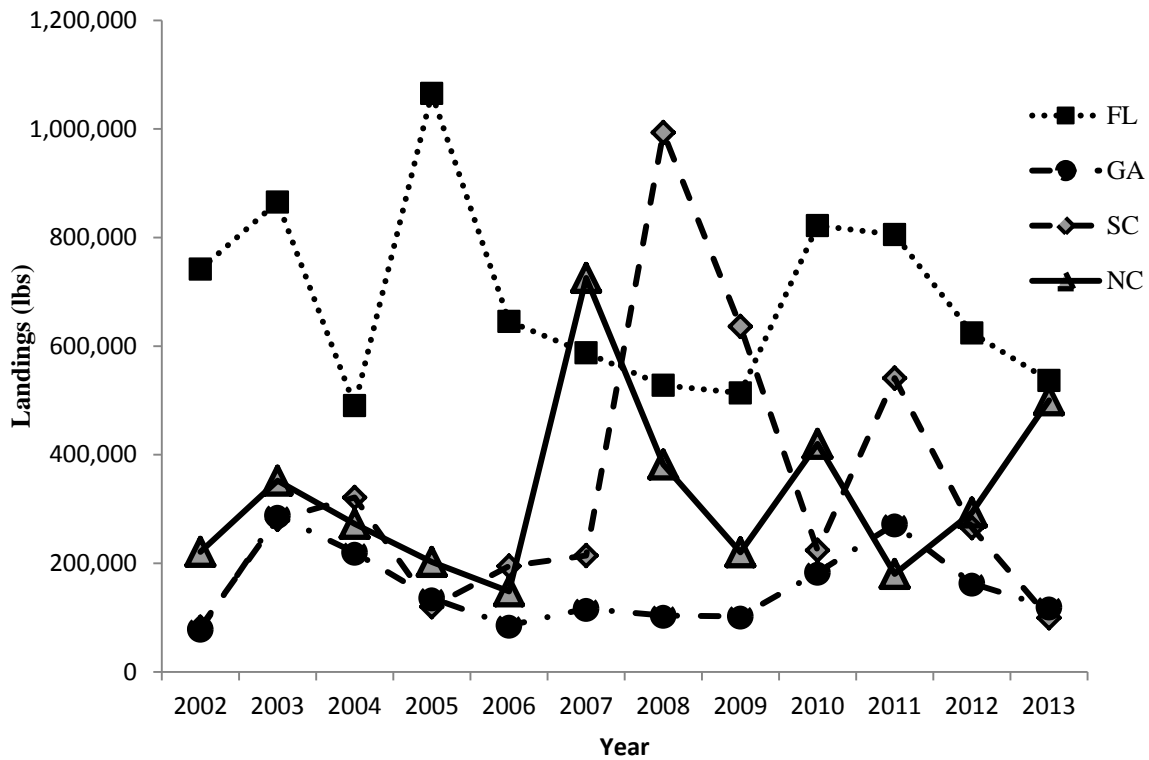


Figure 2. Recreational landings by state in the South Atlantic from 2002 to 2013.

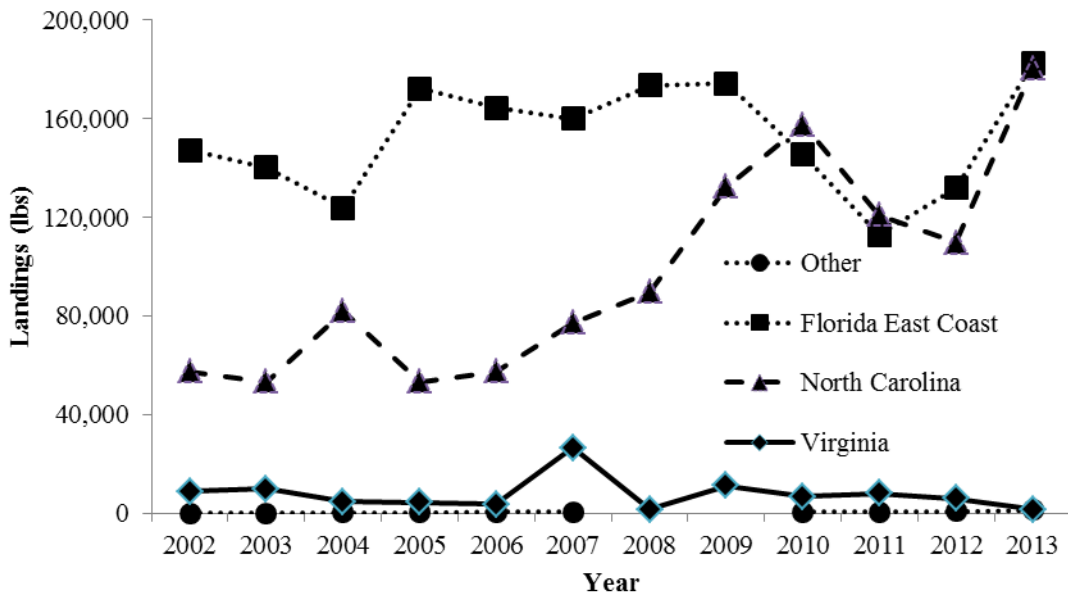


Figure 3. Commercial landings of sheephead by state along the Atlantic Coast from 2002 to 2013

Description of the Fishery (North Carolina)

Sheepshead is a very popular recreational and commercial species in North Carolina. Seemingly, their popularity has increased in the last few years as have their landings. Sheepshead have become a favorite food fish due to their mild taste and are becoming more targeted in the recreational fishery. They are excellent baked, fried or broiled, their meat is white and dry and large bones are easily avoided (Manooch 1984). They are caught recreationally and commercially statewide, mostly from April through November. While fish are present in the fishery every month of the year, there is a peak in landings in the fall months. The highest harvest in the commercial fishery occurs in (Figure 4a). Recreational harvest peaks fluctuate among waves 3-5 (May through October), and in 2013, most sheepshead were caught in the wave 4 (July/August; Figure 4b). Harvest from recreational fishermen using hook-and-line peaked in 2007 at 725,623 pounds. In 2013, over 500,096 pounds of sheepshead were landed by recreational hook-and-line, almost tripling what was harvested in 2011 (180,319 lbs.) but again, the fact that NC has no size limits or bag limits could certainly account for these increases. Even while the recreational hook and line landings appear to have increased over the last two years, preliminary data for 2014 indicates that approximately 129,000 pounds have been harvested since October 2014. It seems that landings continue to fluctuate between the years without trend.

Sheepshead are primarily caught as bycatch in several of North Carolina's commercial fisheries, with the majority of the landings coming from gill nets, pound nets, and haul seines (Table 1). As with the recreational fishery, landings fluctuate from year to year. Gill net landings show that in 2011, 42,374 pounds of sheepshead were harvested, with 36,924 pounds in 2012, increasing to 63,667 pounds in 2013. Haul seines landed 12,539, 7,494, and 12,389 pounds in 2011-2013, respectively. Pound nets were the most variable with 55,600, 43,847, and 82,360 pounds harvested in those same three years. Commercial sheepshead landings for the last 12 years have ranged from 53,232 pounds in 2005 to the 180,225 pounds harvested in 2013, generally increasing since 2009.

Table 1. NC commercial landings of sheepshead by gear from 2002 through 2013.

Gear	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Other	199	189	78	48	92	152	168	523	190	94	940	1,840
Dive	558	442	408	2,369	812	2,442	2,912	3,180	3,003	361	9,987	10,975
Gill Nets	16,923	24,187	23,287	16,482	18,819	21,209	28,813	58,797	60,601	42,391	36,924	63,667
Haul Seines	6,081	8,091	4,924	4,567	11,988	7,868	10,728	16,060	38,597	13,143	9,473	12,350
Hook and Line	485	214		394	103	175	143	378	476	1,689	642	810
Trawls	5,185	8,450	43,885	17,235	11,886	29,416	5,564	4,237	5,478	1,992	2,140	3,940
Pound Nets	27,961	11,766	9,055	12,137	13,793	15,912	41,107	49,164	49,207	55,601	43,847	82,360
Gigs										5,585	5,929	4,285
Total	57,392	53,339	81,637	53,232	57,493	77,174	89,435	132,339	157,552	120,856	109,881	180,225

In 2013, pound nets comprised 45.7 percent, gill nets comprised 35.3 percent and spear fishing landings comprised 6.1 percent of the total commercial landings. Those three gears alone comprised 87.1 percent of all the commercial landings for 2013 (Figure 5). Sheepshead popularity among divers has increased greatly in recent years with spear-fishermen landing over 10,975 pounds of sheepshead in 2013. While only 6 percent of the total commercial landings were harvested by divers in 2013, harvest increased dramatically from the 361 pounds landed in 2011 to the almost 11,000 pounds, two years later. The majority of the dive trips harvesting sheepshead occurred in the Masonboro Sound area in New Hanover County; they averaged approximately 107 pounds per trip, within the last three years as compared to the 10 year average of only 40 pounds per trip (of landing between 1 and 100 pounds).

In North Carolina, both the recreational and commercial landings have fluctuated in the last 12 years, although the commercial landings have stayed more consistent than the recreational landings (Figure 6). One difference between the commercial and recreational landings is most of the commercial landings are incidental to targeting other species while recreational landings tend to be more of a targeted fishery. Other variables play into these landings such as weather, effort, and availability.

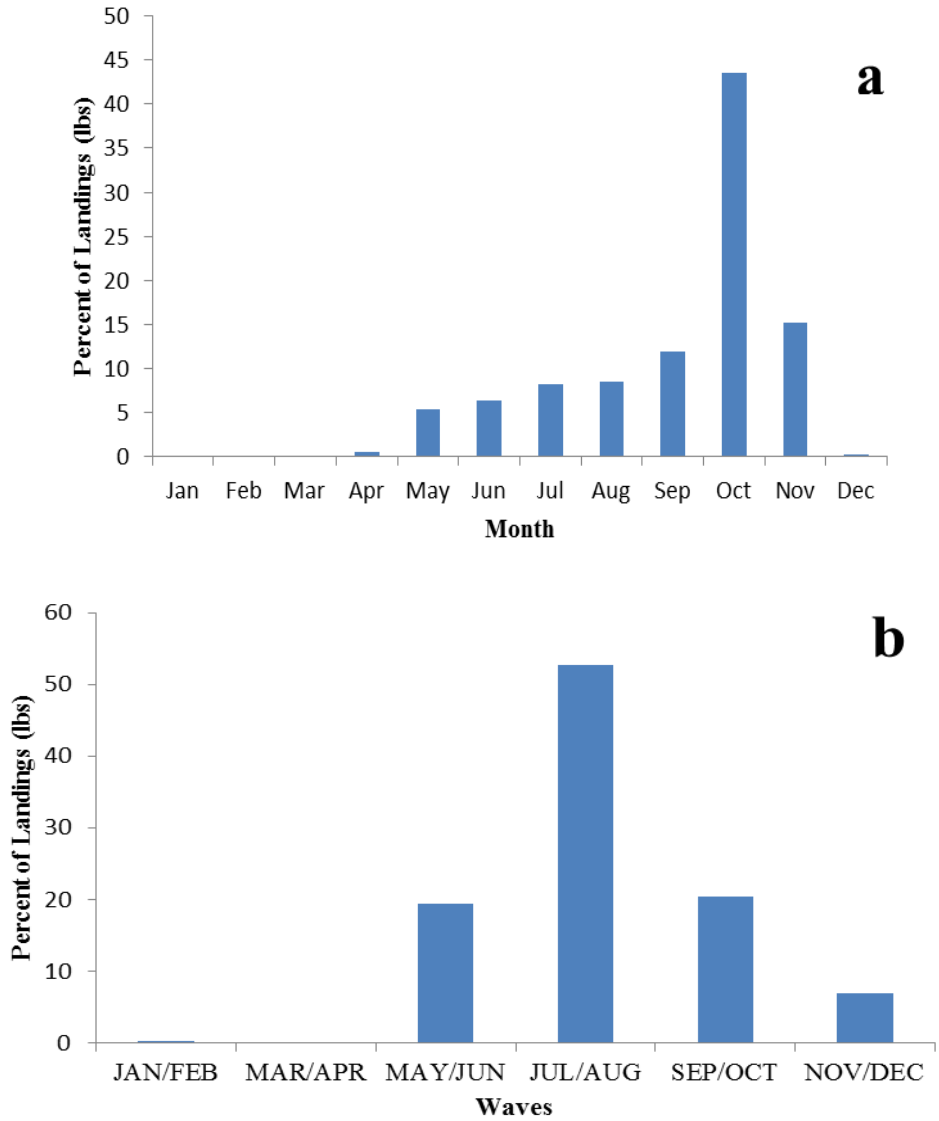


Figure 4. Percent of total landings (pounds) harvested by month for NC sheephead, a.) commercially, 2011 – 2013 and b.) recreationally by wave from the Marine Recreational Information (MRIP) for 2013.

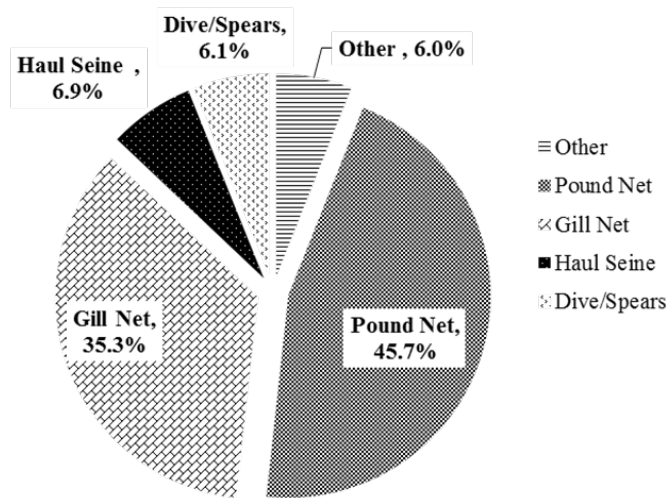


Figure 5. Percentages of North Carolina commercial landings by gear for 2013

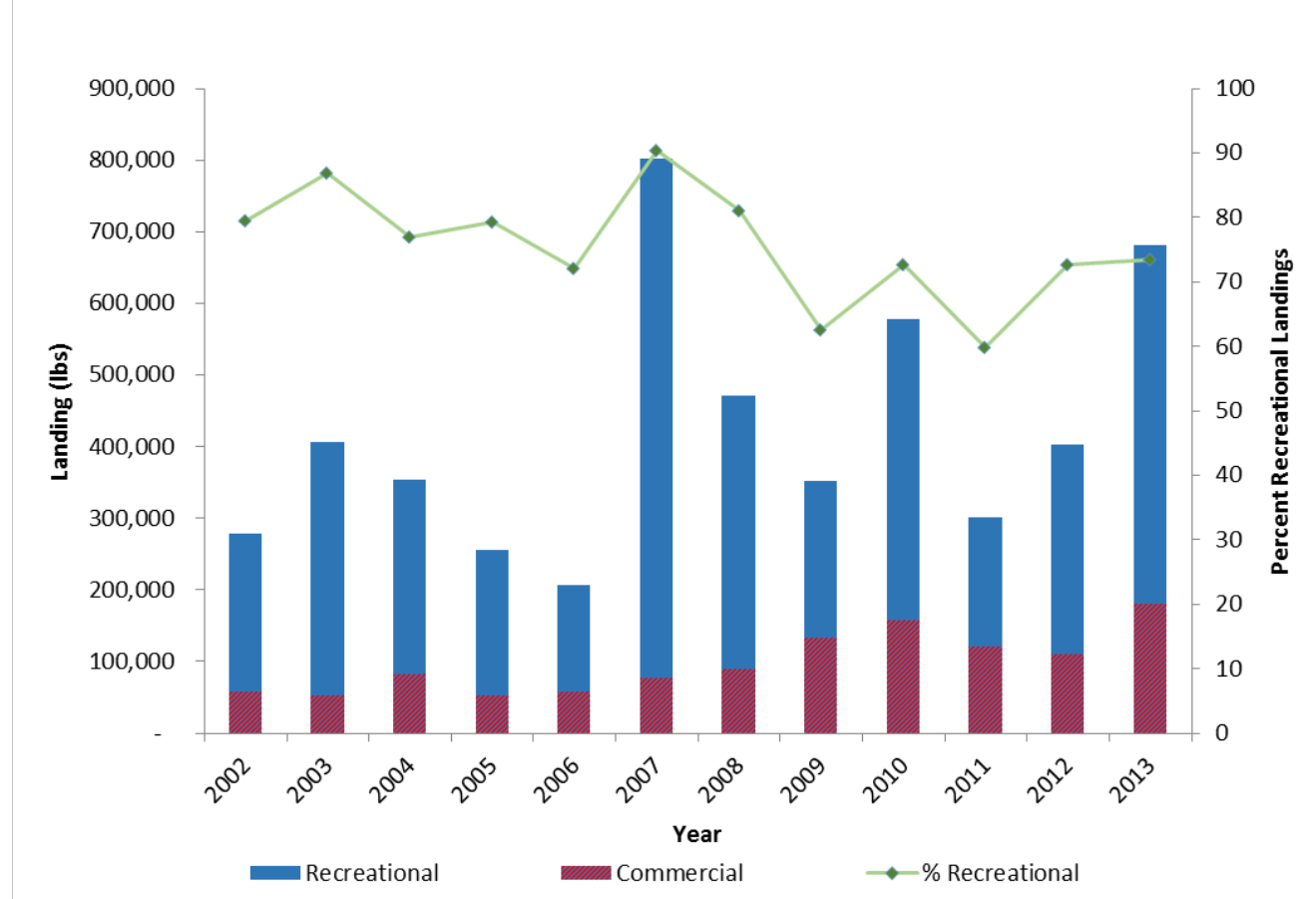


Figure 6. North Carolina sheephead recreational and commercial landings from 2002-13 (recreational landings courtesy of Program MRIP, commercial landings courtesy of North Carolina Division of Marine Fisheries Trip Ticket Program).

IV. AUTHORITY

G.S. 113-134, 113-182, 113-221.1, 143B-289.52
15A NCAC 03M .0521

V. SUMMARY FINDINGS

Until a stock assessment can be done, there are several management measures that could be used to limit the harvest of sheepshead and address any concerns of overfishing or exploitation of juvenile sheepshead. The focus of this information paper is to provide potential management options for sheepshead. This paper provides information to determine how effective minimum size limits, slot limits and/or creel and trip limits would be as management measures for reducing the overall harvest of sheepshead. The harvest reductions provided are estimates calculated based on several assumptions about the data, gear selectivity, gear efficiency, and size class strength. Violations of any or all of these assumptions can affect the precision and accuracy of these numbers. Harvest reductions based on length frequency distributions also have the potential to be biased when the sample size is low and may not be a true indicator of relative fish abundance, thus overestimating harvest reductions. All data presented in this paper is only informational and does not suggest any comprehensive analyses was performed that would be produced with a formal stock assessment.

Recreational Options

To determine what effect a minimum size limit and/or a slot size limit as well as creel limit would have on the recreational landings of sheepshead, length frequency and catch per angler trip data was obtained from the Marine Recreational Information Program (MRIP). MRIP is the primary survey used to collect data on angler harvest from ocean and inside waters along the entire North Carolina coast. MRIP consists of two components, the Access-Point Angler Intercept Survey (APAIS) and the Coastal Household Telephone Survey (CHTS). The CHTS utilizes a random digit dialing (RDD) telephone survey approach to collect marine recreational fishing effort information from residential households located in coastal counties. APAIS, an onsite intercept survey conducted at fishing access-sites, is used for collection of individual catch and discard data for calculation of catch rate at the species level. Creel clerks collect intercept data from January through December (in two-month waves) by interviewing anglers completing fishing trips in one of the four fishing modes (man-made structures, beaches, private boats, and for-hire vessels). Individual lengths (mm-FL) and weights (kilograms) are recorded for each individual species sampled. To calculate length frequencies, millimeters (mm) were converted to inches for this paper and most lengths are in fork length and not total length. Results from both component surveys are combined at the state, area, fishing mode and wave level to provide estimates of the total number of fish caught, released, and harvested; the weight of the harvest; the total number of trips; and total participation in marine recreational fishing.

A modal length frequency distribution was observed for sheepshead caught recreationally from 2002-2013 (Figure 7). These lengths ranged from 6 inches to 25 inches FL, with no particular size dominating the catch. The length frequency for sheepshead varied from year to year, which could be due to variability in the availability of various size sheepshead from year to year or could possibly due to low sample sizes in the recreational fisheries. On average, 22.6 percent of the sheepshead measured from the recreational fishery were 10 inches FL or less (~ size of 50 percent maturity), 40.4 percent were 12 inches FL or less, and 57.5 percent were 14 inches or less. Below are the options of size limits alone with their related reductions and then reductions occurring from a combination of both, size and bag limits.

Size Limits

Listed below are the recreational options of various minimum size limits. Table 2 provides the annual percent harvest reductions based on a 10, 12 and 14 inch minimum fork length size limit and a 12 – 20 inch fork length slot limit for each year from 2002 through 2013, as well as an overall 12-year average. The reduction from a 10 inch minimum size limit ranged from a low of 4.1 percent in 2002 to a high of 40.2 percent in 2013. The overall average reduction across years was 18.3 percent. For a 14 inch minimum size limit, where the majority of fish are mature, higher reduction percentages occur (Average reduction was 51.6 percent across all years). Recreational landings increased considerably in both 2012 and 2013, resulting in higher percent reductions for those two years in all calculations of minimum size limits. It is important to note that the harvest increased as a result of smaller fish being caught as opposed to a proportional increase in harvest across all size classes. With the large amount of fish

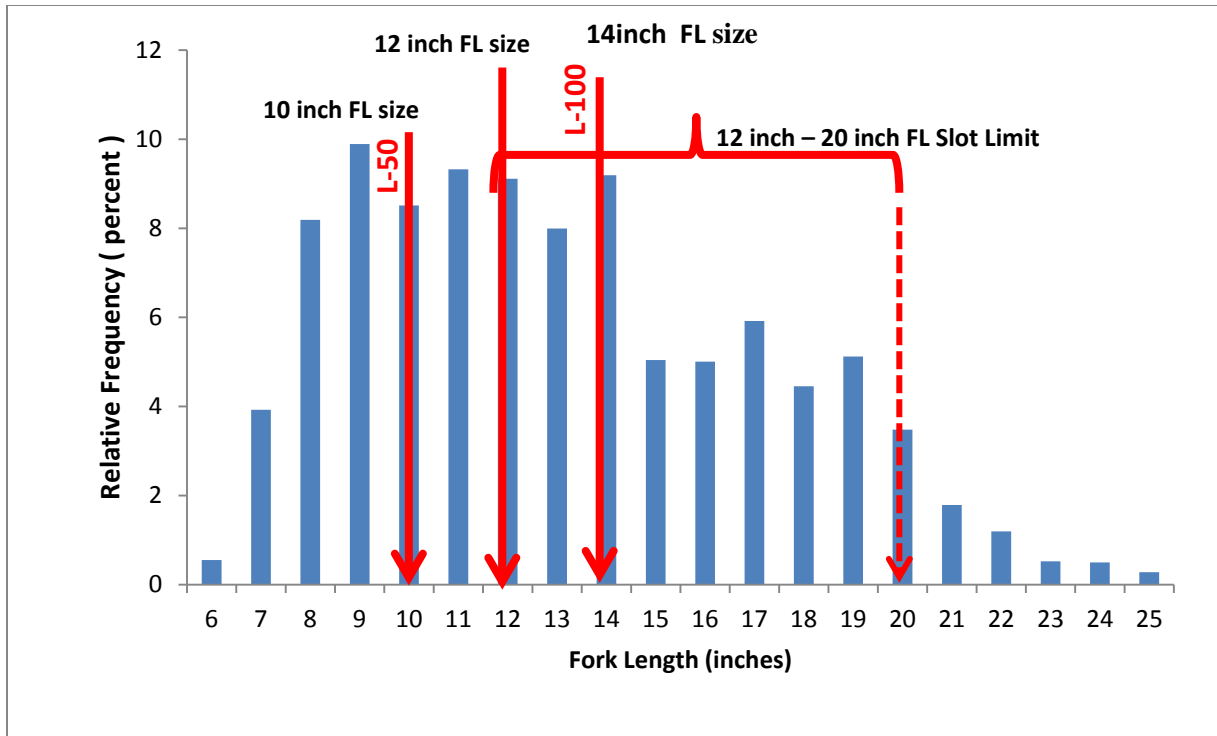


Figure 7. A length frequency distribution of sheephead landed recreationally, 2002- 2013. Arrows indicate potential size and slot limits considered for management. L-50 and L-100 represent the lengths at 50% and 100% maturity.

harvested in 2013, a 76 percent reduction would have occurred in that year, but only be a 52 percent reduction over all 12 years. Again, the fact that there were no size, bag or trip limits during that time needs to be mentioned. Even with a 14 inch limit, there are still 42.5 percent of fish greater than 14 inches (up to 25 inches) left to catch (Figure 7). None of the size bins from this range (6 to 25 inches) contain more than 9.8 percent of fish by number for any one inch size group, demonstrating that anglers are catching sheephead from all size and age classes.

A slot limit of 12 inches to 20 inches would incorporate allowable fish within these sizes where 80 to 100 percent are mature and all other fish smaller or larger would have to be released. Again, these reductions are greater than those of the 10 inch and 12 inch minimum size limits, but that would be expected. However, the 12 year overall reduction would be less (44.4 percent) than the overall 14 inch minimum size limit reduction of 51.6 percent (Table 2).

Table 2. Percent recreational reductions in numbers based on a 10,12, 14 inch (Fork Length) minimum size limit and a 12 inch to 20 inch (FL) slot limit for sheephead in NC.

Minimum Size Limit (FL)	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Average Reduction
10" min	4.1	25.1	8.8	6.8	16.6	9.6	29.1	35.7	5.9	4.3	33.4	40.2	18.3
12" min	21.2	42.5	17.2	8.3	30.0	15.6	45.0	67.2	31.1	17.9	38.5	70.5	33.7
14" min	49.0	52.0	25.8	16.1	46.2	37.5	75.6	79.1	47.1	59.8	54.7	76.4	51.6
12"-20" slot	33.2	52.4	48.0	41.3	37.2	30.5	46.5	69.5	36.7	22.4	41.7	73.4	44.4

Size Limits with Bag Limits

Bag limit analysis indicated most recreational trips caught five fish or less (87 percent of trips) from 2006 to 2013 (Table 3). Greater than 95 percent of the trips had 10 fish or less from 2006 to 2013. No trips have been observed to exceed the past bag limit of 20 fish (included in the SAFMC 20 fish aggregate limit).

Table 3. The cumulative percent of recreational trips with five fish or less, 10 fish or less, 15 fish or less, and 20 fish or less for NC sheepshead.

Number of fish	2006	2007	2008	2009	2010	2011	2012	2013	Combined
5 fish	96	79	86	86	87	97	89	81	87
10 fish	100	91	94	95	97	99	98	95	96
15 fish	100	98	99	100	100	100	100	98	99
20 fish	100	100	100	100	100	100	100	100	100

10 inch FL Minimum Size Limit with bag limit

A 10-inch fork length sheepshead is the approximate size where 50 percent of females are mature while males are around 11 inches at 50 percent maturity, based on a Virginia study. In South Carolina, males are 100 percent mature at age 4 or 14.8 inches FL and females at age 5 or 15.75 inches FL, respectively. If a 10-inch FL size limit and a one-fish bag limit were implemented, there would be a reduction in catch of approximately 74 percent of the sheepshead landed based on the average from 2004 to 2013 (Table 4). A bag limit of five fish would result in a reduction of 39.7 percent, whereas a 10-fish bag limit would yield an overall 28 percent reduction, based on the last 10 years of landings (Table 4). A bag limit going from 5 fish to 1 fish has a much greater harvest reduction than does a reduction going from 10 fish to 5 fish because angler success at maxing out the bag limit is much greater at the lower values. However, if the stock status is sustainable, a 10-fish bag limit would not seem unreasonable and could always be reduced in the future.

Table 4. Annual estimated recreational harvest reductions in numbers of fish based on 10inch FL size limit and up to a ten fish bag limit, 2004 – 2013 for NC sheepshead.

Size	Bag	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Average Reductions
10	1	51.6	52.2	50.4	75.5	78.1	80.9	67.9	56.7	74.5	83.9	74.3
	2	30.3	30.8	30.1	61.0	67.4	69.0	47.8	31.2	62.0	72.9	59.8
	3	17.8	16.9	22.4	51.0	60.3	60.1	35.3	16.8	54.3	65.5	50.5
	4	12.6	12.5	20.5	43.9	54.6	54.2	26.5	11.3	48.9	59.9	44.2
	5	10.6	10.2	19.5	38.1	50.8	50.5	20.3	9.6	44.9	55.2	39.7
	6	9.4	7.9	18.6	32.3	47.4	47.0	16.0	8.2	41.9	52.1	36.1
	7	8.8	6.8	17.6	28.1	44.3	43.8	13.0	7.3	39.8	49.5	33.3
	8	8.8	6.8	16.6	34.3	41.2	41.7	10.4	6.9	38.2	47.8	31.1
	9	8.8	6.8	16.6	21.9	38.5	39.7	8.8	6.5	37.3	46.7	29.5
	10	8.8	6.8	16.6	19.4	36.4	38.2	8.0	6.0	36.5	45.7	28.2

12inch FL Minimum Size Limit with bag limit

Most 12 inch FL sheepshead in North Carolina are mature by this length and are about two years of age. A 12-inch FL minimum size limit with a one fish bag limit would yield an 80.3 percent overall reduction. A bag limit of five fish would result in a 53.8 percent reduction. In 2005, that yearly reduction would have been 11.7 percent and in 2013, that reduction would have jumped to 77.9 percent. Going from 10 to one fish provided a range of 45 percent to 80 percent reductions.

Table 5. Annual estimated recreational harvest reductions in numbers of fish based on 12 inch FL size limit and up to a ten fish bag limit, 2004 – 2013 for sheepshead in NC.

Size	Bag	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Average Reductions
12	1	56.0	53.0	58.4	77.2	83.0	90.2	76.5	62.9	76.5	92.0	80.3
	2	36.6	31.9	41.3	63.6	74.7	84.2	61.8	40.9	64.9	86.6	69.2
	3	25.3	18.3	34.9	54.3	69.2	79.6	52.7	28.6	57.8	82.9	62.0
	4	20.6	14.0	33.3	47.6	64.8	76.6	46.2	23.9	52.8	80.2	57.2
	5	18.8	11.7	32.4	42.2	61.8	74.7	41.7	22.4	49.0	77.9	53.8
	6	17.7	9.5	31.6	36.8	59.2	72.9	38.5	21.2	46.3	76.3	51.0
	7	17.2	8.3	30.8	32.9	56.8	71.3	36.3	20.5	44.3	75.1	48.8
	8	17.2	8.3	30.0	38.7	54.4	70.2	34.4	20.1	42.9	74.2	47.2
	9	17.2	8.3	30.0	27.1	52.3	69.2	33.3	19.7	42.0	73.7	45.9
	10	17.2	8.3	30.0	24.8	50.7	68.4	32.6	19.4	41.3	73.2	44.9

14inch FL Minimum Size Limit with bag limit

At fourteen inches (FL) in length, both sexes of sheepshead have reached 100 percent maturity and are either three or four years of age. Below, Table 6 shows the annual estimated recreational harvest reductions based on a 14-inch FL minimum size for each year since 2004 through 2013. Calculations with various bag limits are shown. A five-fish bag limit would have a 67.4 percent reduction. A 10-fish bag limit would have a 61.1 percent reduction.

Table 6. Annual estimated recreational harvest reductions in numbers of fish based on 14 inch FL size limit and up to a ten fish bag limit, 2004 – 2013 for NC sheepshead.

Size	Bag	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Average Reductions
14	1	60.6	56.9	68.0	83.1	92.5	93.8	81.9	81.8	82.7	93.6	86.1
	2	43.3	37.7	55.0	73.0	88.8	89.9	70.6	71.1	74.1	89.3	78.2
	3	33.1	25.2	50.0	66.1	86.3	87.0	63.6	65.0	68.9	86.4	73.2
	4	28.9	21.2	48.8	61.2	84.4	85.1	58.7	62.7	65.2	84.2	69.8
	5	27.3	19.2	48.2	57.2	83.1	83.9	55.2	62.0	62.5	82.3	67.4
	6	26.3	17.1	47.5	53.2	81.9	82.8	52.8	61.4	60.4	81.1	65.4
	7	25.8	16.1	46.9	50.3	80.8	81.8	51.1	61.0	59.0	80.1	63.9
	8	25.8	16.1	46.2	54.5	79.8	81.0	49.6	60.8	57.9	79.4	62.7
	9	25.8	16.1	46.2	46.0	78.8	80.4	48.7	60.7	57.3	79.0	61.8
	10	25.8	16.1	46.2	44.2	78.1	79.9	48.2	60.5	56.8	78.6	61.1

Recreational Slot Limit

Based on the length frequency distribution, 51.8 percent of the sheepshead landed were between 12 inches and 20 inches FL. Annual estimated harvest reductions based on a 12 to 20 inch (FL) slot limit with any bag limit range from 51 percent up to 83 percent (Table 7). A slot limit with a five fish bag limit would reduce catch of sheepshead by 59.6 percent overall, while a 10 fish bag limit would provide a 51.8 percent reduction.

Table 7. Annual estimated recreational harvest reductions in numbers of fish based on a 12 inch to 20 inch FL slot limit size limit and up to a ten fish bag limit, 2004 – 2013 for NC sheepshead.

Size	Bag	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Average Reductions
12" through 20"	1	72.4	69.9	62.6	81.2	83.5	90.9	78.4	64.9	77.7	92.8	82.8
	2	60.3	56.4	47.4	70.0	75.4	85.3	64.9	44.2	66.7	87.9	73.0
	3	53.1	47.7	41.6	62.3	70.1	81.1	56.5	32.5	60.0	84.6	66.8
	4	50.2	44.9	40.1	56.9	65.8	78.3	50.5	28.1	55.3	82.2	62.6
	5	49.1	43.5	39.4	52.4	62.9	76.5	46.4	26.6	51.7	80.1	59.6
	6	48.4	42.0	38.7	48.0	60.3	74.9	43.5	25.5	49.1	78.7	57.2
	7	48.0	41.3	37.9	44.7	58.0	73.3	41.5	24.8	47.3	77.6	55.3
	8	48.0	41.3	37.2	49.5	55.7	72.3	39.7	24.5	45.9	76.8	53.8
	9	48.0	41.3	37.2	39.9	53.6	71.4	38.7	24.1	45.1	76.3	52.7
	10	48.0	41.3	37.2	38.0	52.0	70.7	38.1	23.8	44.4	75.8	51.8

Commercial Options

Length frequencies and the number of trips landing sheepshead obtained from the NCDMF commercial fisheries dependent sampling programs (Program 400s) were used to determine the impacts of a minimum size limit and/or a slot size limit and commercial trip limits on commercial landings of sheepshead. Length frequencies of sheepshead caught and the number of trips landing sheepshead were examined for the estuarine gill net, ocean gill net, gig, pound net, long haul seine, and ocean trawl fisheries. Sheepshead lengths were collected at local fish houses or on the water at the net when possible. At the fish house random samples of the graded catch (cartons from each market category) were taken. Individual fish were measured (mm, fork length-FL) and total weight (0.1 kg) of all fish measured in aggregate was obtained. Fork lengths are the standard lengths by protocol of the Division's sampling methods for this species. All lengths unless otherwise stated are in FL and any size limit proposed would be in fork length. Currently there is no conversion from FL to total length (TL) for North Carolina; however, Georgia converted its 10-inch FL minimum size limit to a 10.7-inch TL. For this information paper, millimeters (mm) were converted to inches. Subsequent to sampling a portion of the catch, the total weight of the catch by species and market grade was obtained for each trip, either by using the trip ticket weights or some other reliable estimate (i.e., fish house receipts). The number of individuals, aggregate weight, and length frequencies of each species in a sample were expanded to represent the species quantities in the sampled catch (trip ticket). Expansion was accomplished by matching at the market grade level biological fish house sample data (mean weight or length data) to the corresponding North Carolina Trip Ticket Program market grade harvest. For example, the total length frequency of a species within a catch was derived by expanding the length frequency of the individuals measured in the subsample of a market grade (culled samples) to the total market category weight of that species in the sampled trip.

From 2002 to 2013, the major commercial gears used were estuarine gill nets, gigs, spearfishing while diving, long haul, ocean gill nets, ocean trawl, and pound nets (both flounder and sciaenid combined). The percentages of landings harvested by these various gears have already been mentioned (Figure 5). Below are the length frequency graphs of sheepshead harvested from specific gears (Figures 8 and 9). Commercial reductions based on size limits and trip limits are presented in two separate sections. The first section describes harvest reductions from implementation of size limits of 10, 12, and 14-inches (FL) and a slot of 12 to 20 inch FL (Table 8). The other section discusses harvest reductions calculated from trip limits of 100 to 500 pounds. These are all associated with the different gears used in N. C. coastal waters. The reductions are for all years combined from 2002 through 2013.

Reductions using size limits by gear

Overall estimated harvest reductions based on size limit options vary by fishery and range from 4.2 percent to 73.6 percent (Table 8). The largest overall reductions (73.6 percent) would occur in the gig fishery. All gears with the exception of the ocean trawl fishery would experience harvest reductions of 64.2 percent to 73.6 percent if a 14-inch FL minimum size limit were imposed. The overall estuarine gill net harvest would be reduced by as little as 6 percent with a 10-inch FL size limit and as much as 65 percent with a 14-inch FL size limit. Annual reductions in the pound net fishery would range from 21.2 percent to 69 percent.

Estuarine Gill Nets

A uni-modal length frequency distribution was observed for sheepshead caught in this gear from 2002-2013 (Figure 8a). The percentage of sheepshead landed in gill nets between 11 and 14 inches FL was 64.6 percent. The overall harvest reduction with a 10 inch minimum size limit is 6.0 percent, for a 12 inch size limit the reduction would be 28.3 percent, a 14 inch size limit would reduce catch by 64.9 percent and a 12-inch to 20-inch slot limit would reduce harvest by 28.9 percent (Table 8).

Pound Nets

Sixty-seven point two percent of the fish harvested in this gear were from 8 to 13 inches FL (Figure 9g). This demonstrates the wider size selection of sheepshead caught in this gear. The estimated harvest reduction with a 10 inch minimum size limit is 21.2 percent. The overall harvest reduction with a 12-inch minimum size limit is 47.5 percent. A 14 inch size limit would result in a 69 percent reduction and a slot limit between 12 and 20 inches would reduce catch by an overall 49.5 percent (Table 8).

Gig

A modal length frequency distribution was observed for the sheepshead caught in the gig fishery from 2002 -2013 (Figure 8b). Forty-five percent of the gig fishery is comprised of 11-inch to 14-inch FL sheepshead. The overall harvest reduction for years 2002 through 2013 in the gig fishery is 20.1 percent for a 10-inch size limit, 39.8 percent for a 12-inch size limit, 73.6 percent for a 14-inch size limit and 41.7 percent with the 12 to 20 inch slot limit (all FL, Table 8).

Long Haul

Approximately 61.2 percent of the sheepshead landed in the long haul fishery from 2002 to 2013 were between 10 and 13 inches FL, with one large fish being caught at 37 inches FL. Long haul gear was the third largest harvester of sheepshead with 12.1 percent or ~ 59,660 fish caught in this gear (Figure 9d). With just minimum size limits imposed, weighted average reduction percentages range from 9.7 percent (10-inch FL), 39.7 percent (12-inch FL), and 70.9 percent (14-inch FL). Adding a 12 to 20 inch FL slot limit would yield a 41 percent overall combined reduction (Table 8).

Ocean Gill Net

The length frequency distribution of the ocean gill net fishery demonstrates high abundance of nine-inch sheepshead (32.2 percent). Additionally, 84.5 percent of the landing are comprised of 8-inch to 15-inch FL sheepshead, representing a wide range of sizes (Figure 9e). Table 8 depicts the overall harvest reductions from size limits of 10, 12, and 14 inch sizes of 40.9, 55.5, and 70.5 percent, respectively. The slot limit of 12 to 20 inches FL would reduce harvest from the ocean gill net fishery by 59.4 percent.

Ocean Trawl

The ocean trawl fishery captured 92,094 (7.9 percent) fish from 192 trips. There is no data for this fishery for 2012 and 2013 (i.e., all data are from the years 2002 through 2011). Of these fish, 14,426 (64.1 percent) were comprised of 18 to 21-inch FL size classes (Figure 7f). Smaller sheepshead from six to 16-inches FL comprised 21.7 percent of the length-frequency distribution, whereas the majority was larger sized sheepshead within the 19 to 21 inch FL size group or 54.4 percent (Figure 9f). A 10-inch FL size limit would yield overall a 4.2 percent reduction, a 12-inch FL size limit would yield an 8.3 percent reduction, a 14-inch FL size limit would yield a 15.8 percent reduction and the 12 to 20 inch FL slot limit would yield a 48.4 percent reduction in harvest.

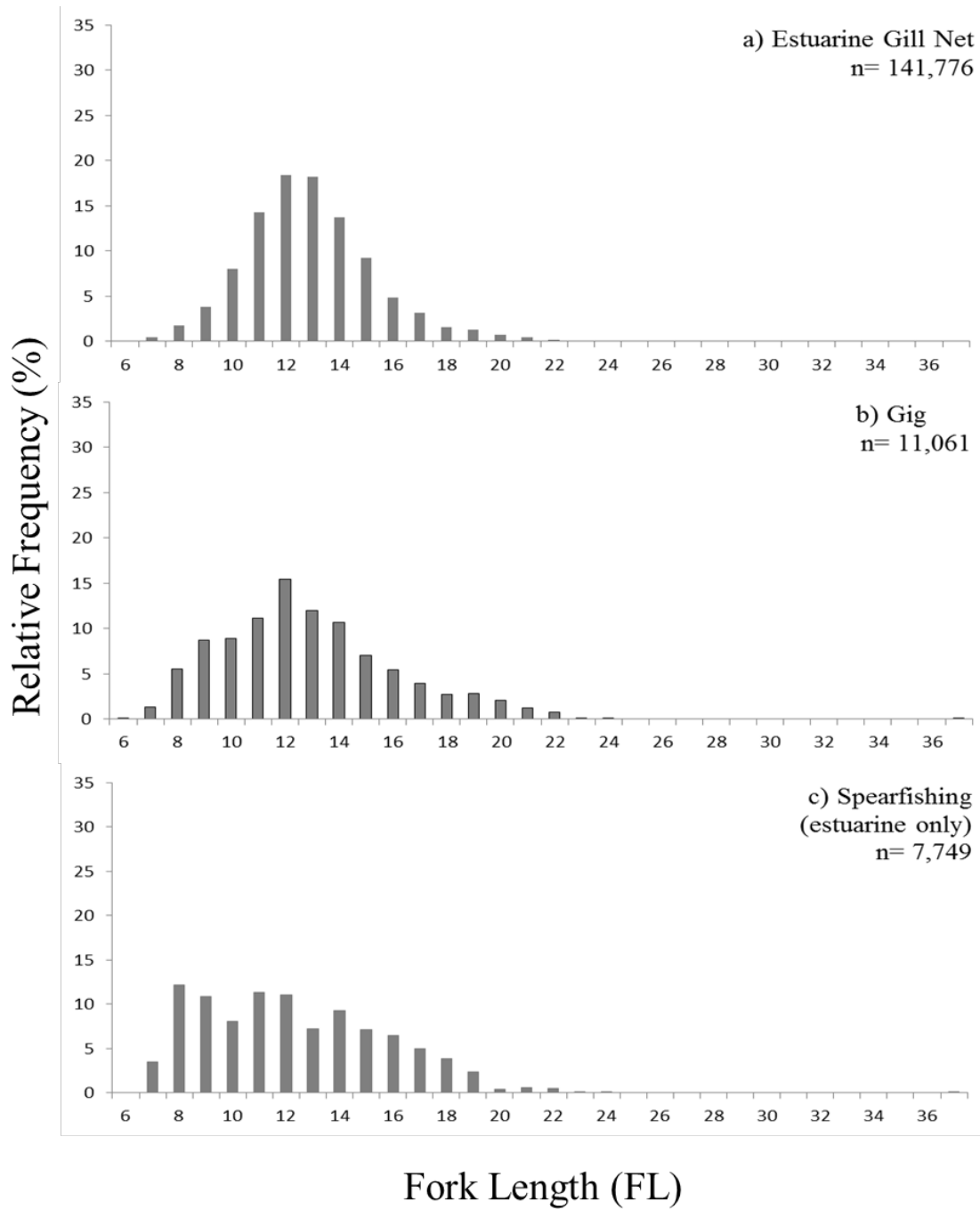


Figure 8. Weighted length-frequencies for estuarine gill nets, gigs, and spearfishing commercial gears from 2002-2013 in North Carolina.

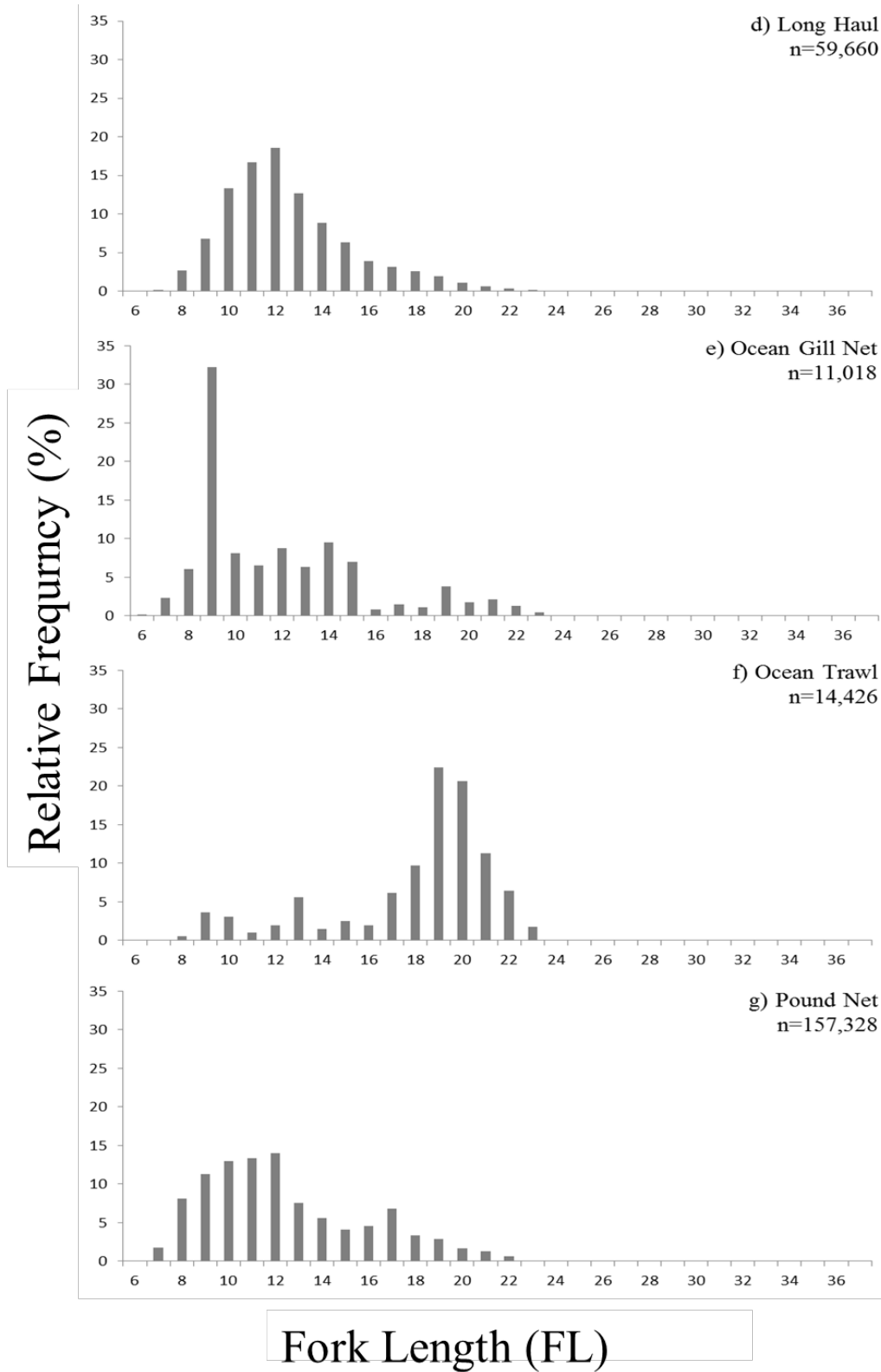


Figure 9. Weighted length frequencies of fish harvested from commercial gear of the long haul, ocean gill net, ocean trawl, and pound net fisheries from 2002-2013 in North Carolina.

Table 8. Percent reductions in harvest numbers for commercial gears based on various options of size limits of 10-inch, 12-inch, 14-inch FL and a slot limit of 12 inches to 20 inches FL for NC sheepshead. Reductions are based on number of pounds landed per year with the last column showing all years combined.

Option	Fishery	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	All years combined (2002-2013)
10" Size Limit	Estuarine Gill Net	5.2	1.0	1.1	0.0	1.4	6.1	8.2	7.2	2.0	0.4	24.2	7.6	6.0
	Pound Net	27.7	5.9	0.0	1.3	11.3	40.6	27.3	18.0	2.0	1.7	79.6	10.1	21.2
	Gig	13.5	15.4	0.3	14.0	5.8	14.9	15.4	15.1	4.5	0.7	47.4	12.4	20.1
	Long Haul	5.9	15.4	0.0	9.8	1.9	11.9	15.9	12.4	2.4	0.0	34.2	25.5	9.7
	Ocean Gill Net	12.1	0.0	0.0	9.6	3.4	8.1	10.0	86.5	67.2	0.0	44.8	72.7	40.9
	Ocean Trawl	59.7	4.7	0.2	11.4	0.0	0.0	50.0	13.4	0.1	0.3			4.2
	Spear/Diving			0.3		7.1	13.1	17.4	14.0	4.7	0.9	48.1	12.8	26.5
12" Size Limit	Estuarine Gill Net	17.1	37.0	4.2	7.2	9.7	32.1	39.0	45.6	18.3	7.4	26.9	40.9	28.3
	Pound Net	78.8	35.1	1.8	3.4	21.3	54.4	63.6	48.0	21.2	2.7	85.2	49.5	47.5
	Gig	39.8	42.5	1.6	23.5	20.5	33.1	47.0	48.9	27.7	7.3	53.1	41.4	39.8
	Long Haul	7.4	51.4	4.8	12.8	19.0	37.8	45.4	65.9	29.9	9.6	34.6	69.3	39.7
	Ocean Gill Net	33.3	0.0	0.0	16.0	6.7	22.0	32.5	92.1	97.1	0.0	49.0	85.3	55.5
	Ocean Trawl	59.7	9.7	0.4	22.8	0.0	0.1	50.0	46.0	0.6	5.2			8.3
	Spear/Diving			2.0		14.0	30.3	54.1	47.0	27.7	8.2	53.4	42.3	45.8
14" Size Limit	Estuarine Gill Net	33.7	73.2	45.3	38.1	33.9	68.1	73.8	85.4	69.7	51.1	51.5	67.3	64.9
	Pound Net	81.2	63.0	16.1	11.3	34.0	69.5	77.0	79.2	58.2	16.4	86.0	83.8	69.0
	Gig	47.0	57.9	6.4	37.4	34.0	55.3	77.7	83.1	71.8	41.9	62.5	67.0	73.6
	Long Haul	13.7	65.3	37.8	15.8	31.8	49.9	76.6	98.2	78.3	58.3	36.4	69.8	70.9
	Ocean Gill Net	34.9	41.9	1.0	25.0	29.8	54.0	85.5	92.1	97.1	40.1	53.6	88.8	70.5
	Ocean Trawl	59.7	20.7	1.6	22.8	0.0	15.4	50.0	82.1	28.5	33.1			15.8
	Spear/Diving			7.6		26.0	54.8	72.6	82.4	71.3	45.9	60.6	67.4	64.2
12"-20" Slot Limit	Estuarine Gill Net	17.1	38.0	5.2	8.8	11.8	33.1	39.8	46.2	18.5	8.0	27.5	41.3	28.9
	Pound Net	79.9	37.9	11.7	13.2	28.3	59.5	66.1	48.8	23.2	6.0	85.5	50.8	49.5
	Gig	44.6	48.1	25.7	28.5	25.4	38.9	48.7	49.7	28.4	9.4	53.6	43.3	41.7
	Long Haul	8.4	53.4	4.8	27.2	28.3	44.8	46.5	65.9	30.1	10.1	35.3	69.3	40.9
	Ocean Gill Net	33.7	0.0	13.1	16.0	26.8	30.8	33.0	97.0	100.1	0.0	75.6	85.3	59.4
	Ocean Trawl	62.6	25.0	27.8	38.7	0.8	15.3	50.0	46.7	71.8	7.8			27.8
	Spear/Diving			51.7		33.1	43.6	58.7	48.7	29.5	11.2	53.9	44.7	47.5

Spears/Diving

The length frequency distribution of the spear/dive fishery was made up of 7,749 sheepshead, of which 4,189 or 53.4 percent were all between 8 and 12 inches FL. Percentages of overall harvest reductions by size limits (10, 12 and 14 inches FL) would be 26.5, 45.8, and 64.2 percent and the slot limit size limit of 12 to 20 inches FL would yield a 47.5 percent reduction (Table 8).

Previously mentioned was the increase in landings from the spears/diving fishery. When looking at the landings from 2011 through 2013, spearing for sheepshead took place from Bogue Sound south to Brunswick County. In 2011, a total of only 361 pounds was harvested from Masonboro Sound and the ocean, both in state and federal waters. In 2012, that number jumped to 9,987 total pounds harvested, with less than 500 pounds coming from Bogue Sound, and approximately 35 pounds, from the Cape Fear River. The remaining 9,483 pounds came from Masonboro Sound and the ocean, south of Cape Hatteras. The number of pounds speared from Masonboro Sound was 9,099 pounds or 94 percent of the years catch. In 2013, the total landings were 10,975 pounds, of which approximately 500 pounds came from the Cape Fear and Brunswick County Intracoastal Waterway (ICWW); the remaining 95 percent or 10,433 pounds were harvested from the same three locations of Masonboro Sound, and the ocean both inshore and outside three miles. The effort in this fishery has increased substantially in the last three years and preliminary landings from 2014 (through September) are approximately 15,000 pounds. While this may not be significant when looking at overall commercial landings, it should at least be mentioned. Gigs harvested 4,285 pounds or 2.4 percent in 2013, and 5,929 pounds (5.4 percent) of 2012 landings.

Commercial Trip Limits by Gear

Estuarine Gill Nets

A total of 99.3 percent of the estuarine gill net trips sampled landed from one to 100 pounds of sheepshead from 2002-2013 (Table 9). An average of nine pounds of sheepshead was landed per trip (Table 10). Less than one percent of the trips (n=11) landed more than 500 pounds of sheepshead, of these trips an average of 1,023 pounds was landed per trip (Table 10). The overall estimated harvest reduction with a 500 pound trip limit is 1.48 percent, whereas a 200 pound trip limit would yield a four percent reduction (Table 11). This is due to the small amount of sheepshead harvested from 300 to 500 pound trips and emphasizes the large amount of sheepshead commercially harvested in the 1 to 100 pound trip range, where 38,838 trips were taken from a total of 39,101 trips (Table 9).

Except for the 181 trips or 0.5 percent catching fish in the 101 to 200 pound range, there were very few other trips catching sheepshead.

Pound Nets

Approximately 87 percent of the pound net trips landed 100 pounds or less of sheepshead with an average of 19 pounds per trip (Tables 9 and 10). Trips landing 101 to 200 pounds (6 percent) harvested an average of 144 pounds of sheepshead per trip (Table 10). Trips landing more than 500 pounds per trip (2.5 percent) landed an average of 1,048 pounds of sheepshead. The overall estimated harvest reduction with a 500 pound trip limit is 20.89 percent, the smallest reduction compared to a 55.3 percent reduction with a 100 pound trip limit (Table 11).

Gig

Over 1,855 or 98 percent of gig trips harvesting sheepshead landed 100 pounds or less. Each trip caught on average, 14 pounds of sheepshead. Tables 9 and 10 show the majority of trips taken harvested between one to 200 pounds. Other than the 29 trips catching 101 to 200 pounds (average pounds; 137), only 6 trips caught between 200 and 300 pounds and only one trip each captured the 300 to >500 pound trips. Table 11 shows the largest reduction of 8.2 percent would be seen in the gig fishery when a 100 pound trip limit was implemented.

Table 9. Percent of commercial trips landing sheepshead by gear over a range of weight categories for pounds landed per trip, 2002 – 2013 in NC.

Fishery	1-100 lbs.		101-200 lbs.		201-300 lbs.		301-400 lbs.		401-500 lbs.		> 500 lbs.		Total trips
	#	%	#	%	#	%	#	%	#	%	#	%	#
Estuarine Gill Net	38,838	99.3	181	0.5	48	0.1	14	0.0	9	0.0	11	0.0	39,101
Pound Net	5,289	87.2	359	5.9	133	2.2	73	1.2	63	1.0	151	2.5	6,068
Gig	1,855	98.0	29	1.5	6	0.3	1	0.1	-	0.0	1	0.1	1,892
Long Haul	1,521	80.9	190	10.1	62	3.3	44	2.3	23	1.2	41	2.2	1,881
Ocean Gill Net	1,711	99.2	9	0.5	2	0.1	2	0.1	-	0.0	1	0.1	1,725
Ocean Trawl	122	63.5	17	8.9	13	6.8	5	2.6	3	1.6	32	16.7	192
Spear/Diving	138	61.9	57	25.6	19	8.5	6	2.7	3	1.3	-	-	223

Long Haul

The majority of reductions in the long haul fishery would occur under a 100 or 200 pound trip limit with a 47.0 and 29.4 percent reduction, respectively (Table 11). Out of a total of 1,881 trips, 1,521 trips landed on average 26 pounds of sheepshead per trip and 190 trips made up the 101 to 200 pound range where the average trip harvested 139 pounds (Tables 9 and 10). The remaining 9 percent of the trips comprised the 200 to over 500 pounds per trip level (Table 9).

Ocean Gill Net

One thousand seven hundred and eleven trips or 99.2 percent of fishermen caught 100 pounds or less of sheepshead per trip, with an average of 11 pounds per trip. Any trip limit higher than 100 pounds would result in very few reductions, because the majority of fish were landed from trips in the 1- 100 pound range. That percentage of reduction would only be 8.1 percent in the 100 pound range and a 1.3 to 4.3 percent range with a 500 to 200 pound trip limit range (Table 11).

Ocean Trawl

The ocean trawl fishery had 122 trips (63.5 percent) with 100 pounds or less of sheepshead caught per trip. Of those trips, the average amount landed per trip was 25 pounds. This fishery had 16.7 percent or 32 trips taken where over 500 pounds were caught. Surprisingly, the average catch per trip was 2,509 pounds (Tables 9 and 10). No data was provided for 2012 and 2013, but the 10 years of annual reductions show that this fishery would have the largest reductions of all gears with a range of 89.1 percent with a 100 pound trip limit decreasing to a 69.79 percent reduction with a 500 pound trip limit (Table 11).

Spears/Diving

The majority (62 percent) of the spear/diving trips landed one to 100 pounds of sheepshead (Table 9), with an average of 40 pounds per trip (Table 10). The average pounds landed for trips between 201-300 pounds was 235

Table 10. Average sheephead landings (pounds) per commercial trip by specified weight categories, 2002 – 2013 in NC.

Fishery	1-100 lbs.	101-200 lbs.	201-300 lbs.	301-400 lbs.	401-500 lbs.	>500 lbs.
Estuarine Gill Net	9	137	244	351	455	1,023
Pound Net	19	144	248	352	449	1,048
Gig	14	137	232	322	-	>500
Long Haul	26	142	245	346	457	849
Ocean Gill Net	11	139	228	354	-	796
Ocean Trawl	25	146	254	341	438	2,509
Spear/Diving	40	145	235	350	420	-

pounds. Spear/dive trips landing between 301 and 500 pounds of sheephead averaged 350 and 420 pounds per trip, respectively. There were no spear/dive trips landing more than 500 pounds. The largest overall estimated harvest reduction is 35 percent and would occur with a 100 pound trip limit. Only a three percent reduction with a 300 pound trip limit, less than one percent with a 400 pound trip limit and no reductions would be seen with a 500 pound trip limit (Table 11).

Table 11. Percent reductions in harvest numbers for commercial gears based on a 100 through 500 pound trip limit, 2002 - 2013.

Options	Fishery	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	All years combined (2002-2013)
100 lb. Trip Limit	Estuarine Gill Net	0.4	0.7	0.3	0.9	2.1	2.4	6.7	9.6	13.8	3.9	6.7	16.1	7.8
	Pound Net	40.2	18.3	15.7	42.0	47.3	35.2	49.2	67.2	55.5	62.3	57.6	67.3	55.3
	Gig	0.0	0.0	0.0	12.2	18.7	22.9	8.0	1.5	1.1	15.1	4.9	4.3	8.2
	Long Haul	42.1	24.4	5.7	17.9	39.7	29.5	38.4	48.8	69.1	52.4	39.8	45.1	47.0
	Ocean Gill Net	6.5	1.5	26.4	0.0	2.3	0.0	8.6	0.0	0.0	0.0	0.0	26.7	8.1
	Ocean Trawl	7.0	74.8	97.2	88.9	87.3	84.6	0.0	59.8	84.7	64.8	0.0	89.1	89.1
	Spears/Diving			0.0		0.0	0.0	0.0	0.0	0.0	0.0	39.8	33.3	35.1
	200 lb. Trip Limit	Estuarine Gill Net	0.0	0.0	0.0	0.0	0.3	0.2	3.0	4.6	5.6	1.4	4.1	11.1
Pound Net		23.2	8.9	4.4	24.7	30.0	20.7	30.2	54.3	41.0	48.5	41.4	54.9	40.7
Gig		0.0	0.0	0.0	0.0	6.2	17.5	0.3	0.0	0.0	3.7	0.1	0.9	2.3
Long Haul		19.4	14.4	0.1	9.4	23.6	14.7	22.7	29.0	51.6	34.7	15.9	19.9	29.4
Ocean Gill Net		0.0	0.0	14.3	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0	20.0	4.3
Ocean Trawl		0.0	57.0	95.1	81.6	79.1	75.1	0.0	32.6	79.0	37.1	0.0	82.5	82.5
Spears/Diving				0.0		0.0	0.0	0.0	0.0	0.0	0.0	13.5	8.0	10.3
300 lb. Trip Limit		Estuarine Gill Net	0.0	0.0	0.0	0.0	0.0	0.0	1.2	3.0	2.7	0.3	3.4	8.3
	Pound Net	13.7	5.8	0.0	13.9	19.4	13.3	20.1	46.4	31.7	40.7	29.4	46.6	31.8
	Gig	0.0	0.0	0.0	0.0	0.0	13.2	0.0	0.0	0.0	0.4	0.0	0.0	1.0
	Long Haul	4.7	9.5	0.0	5.0	16.9	5.9	15.0	16.5	39.6	27.5	5.9	8.2	19.8
	Ocean Gill Net	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.2	2.7
	Ocean Trawl	0.0	45.9	93.5	75.2	72.6	67.0	0.0	17.1	74.1	14.0	0.0	77.4	77.4
	Spears/Diving			0.0		0.0	0.0	0.0	0.0	0.0	0.0	4.6	1.8	3.0
	400 lb. Trip Limit	Estuarine Gill Net	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.3	1.5	0.1	2.9	6.7
Pound Net		9.0	4.0	0.0	5.6	12.8	6.9	13.4	40.0	24.5	34.5	21.0	40.3	25.5
Gig		0.0	0.0	0.0	0.0	0.0	8.9	0.0	0.0	0.0	0.0	0.0	0.0	0.7
Long Haul		1.3	5.2	0.0	1.9	11.9	1.9	10.0	8.9	31.1	22.7	1.6	1.5	13.9
Ocean Gill Net		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.9	1.8
Ocean Trawl		0.0	37.3	92.0	69.4	67.8	61.1	0.0	10.8	69.2	1.3	0.0	73.4	73.4
Spears/Diving				0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.1	0.3
500 lb. Trip Limit		Estuarine Gill Net	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.7	0.0	2.5	5.6
	Pound Net	6.8	2.2	0.0	1.7	8.1	3.3	8.6	34.9	19.7	29.4	15.4	35.2	20.9
	Gig	0.0	0.0	0.0	0.0	0.0	4.6	0.0	0.0	0.0	0.0	0.0	0.0	0.3
	Long Haul	0.0	2.7	0.0	0.0	8.2	0.0	6.6	4.8	24.3	18.4	0.0	0.0	10.1
	Ocean Gill Net	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.7	1.3
	Ocean Trawl	0.0	28.7	90.6	64.6	63.0	55.6	0.0	4.4	64.3	0.0	0.0	69.8	69.8
	Spears/Diving			0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Summary

Table 12 depicts the overall estimated commercial harvest reduction percentages by gear type based on a 100 to 500 pound trip limit range. The greatest reductions occur in ocean trawl gear. Smaller reductions are seen throughout the commercial gears in general with exceptions in the pound net and ocean trawl gears. For all fisheries, the largest reduction (36.6 percent) would occur with a 100 pound commercial trip limit implemented.

Table 12. Summary of percent reductions with associated 100 to 500 pound trip limits by gear for 2002 through 2013.

Fishery	Commercial Trip Limit (LBS)				
	100	200	300	400	500
Estuarine Gill Net	7.8	4.0	2.6	1.9	1.5
Pound Nets	55.3	40.7	31.8	25.5	20.9
Gigs	8.2	2.3	1.0	0.7	0.3
Long Haul	47.0	29.4	19.8	13.9	10.1
Ocean Gill Net	8.1	4.3	2.7	1.8	1.3
Ocean Trawl	89.1	82.5	77.4	73.4	69.8
Spears/Diving	35.1	10.3	3.0	0.3	0.0
All Fisheries	36.6	26.5	21.0	17.3	14.7

VI. DISCUSSION

Management options include: status quo until a stock assessment can be done, establish a minimum size limit, establish a recreational creel limit, and a commercial trip limit:

- The least restrictive of these options would be Status quo, as North Carolina does not currently have any recreational or commercial regulations for this species.
- Establishing a minimum size limit is a common management measure used to allow a greater portion of fish the opportunity to spawn before they can be harvested. The short term effects of a minimum size limit increase would diminish the pool of younger and smaller fish immediately available for harvest, which in turn would decrease the overall catch. Protecting fish so that they can reach spawning size is a common practice in fisheries management. Currently, there are no regulations to prevent overfishing from occurring in the sheepshead fisheries; however, little is known about their population biomass.
- Establishing a maximum size limit is a management measure used to expand the age structure of a stock. Maximum size limits have successfully been used to manage red drum, which are a long lived species. Sheepshead are also long lived, but mature relatively early, unlike the red drum. When over-exploitation occurs, there is a decline in the number of age classes represented in the fishery. The absence of a diverse age structure compromises the ability of any fish stock to recover. Because adult sheepshead are large and highly fecund they are extremely valuable to the stock's reproductive potential and excessive harvest could increase the chance of recruitment failure.
- By establishing a slot limit, limited harvest of juvenile sheepshead would be permitted to continue and a reasonable level of survival and escapement is provided. Slot limits also provide for the maximum possible protection of the adult spawning stock.
- Another management measure used to reduce the current harvest rate of a stock is to establish a recreational creel or bag limit that limits the number of fish allowed to be kept during a trip by an individual or boat. Commercial trip limits can also be established to reduce harvest rates. Both bag limits and trip limits reduce fishing mortality, further allowing a stock to recover. However, restricting trip limits could result in increased discards in both the gill net and pound net fisheries on days when large catches occur. Creel limits tend to work better in the recreational fishery because catches are often less variable than the commercial fishery.

A combination of recreational and commercial size limits, a slot limit, creel limits, and trips limits can be used to reduce the harvest of sheepshead in North Carolina if needed.

Determining the need to constrain harvest and devise an effective management strategy is never a simple task, but is confounded when the status of the stock is unknown. According to the N.C. Fisheries Reform Act, stock status is determined by the stock's ability to achieve sustainable harvest. Such an approach reflects stock biomass, and is typically used to determine whether a stock is overfished. A stock is also evaluated based on the rate of removals, e.g. the F rate, which determines whether overfishing is occurring. These parameters (benchmarks) for the N.C. sheepshead stock have not been determined and for this reason sheepshead are listed as unknown in the NCDMF's 2014 stock status report. While the rule granting the Fisheries Director proclamation authority has been adopted, it is still uncertain what foundation the NCDMF has to base the need/level for management actions. As noted in the comments from the regional advisory committees during the 2013 rule development, they did not support more regulations without additional data to support such restrictions.

While critical data are lacking and the NCDMF is not able to provide quantitative evaluations of reductions in F or increases to spawning stock biomass from possible management options, this does not eliminate the need to evaluate if there is a management approach that provides for a reasonable level of protection, guarding against expansion of fisheries that may negatively impact the stock. When managed under the SAFMC, possession limited to the aggregate 20-fish creel limit was the sole management action. Discussion on future actions will need to balance uncertainty about the need for further protection with the magnitude of the socioeconomic consequences.

Another consideration is operating within the intent of N.C. General Statute 113-182.1 that requires adoption of fishery management plans for all commercially or recreationally significant species or fisheries that comprise state marine or estuarine resources. The NCDMF is developing a policy to address what constitutes a significant species or fishery, necessitating development and approval of a fishery management plan for management. Guidance is also needed about when management measures are appropriate to implement if a species or fishery falls outside of the determination of "significant." There is overwhelming agreement that there is a need for consistency in how the NCDMF and NCMFC manage all species, not just sheepshead. With that said, further discussion of management options is presented.

The implementation of a recreational 10-inch FL minimum size limit and a 10-fish creel limit would reduce harvest by 28.2 percent in the recreational sector. A 12-inch minimum size limit would reduce the commercial sheepshead fisheries by as much as 8 to 56 percent throughout various gears. A variety of combinations of options are possible. An out-of-the-box option of mixing a smaller size limit with a specific creel limit and a larger size limit with a smaller creel limit may be a possibility.

Establishing a minimum size limit or a slot limit in conjunction with a recreational creel limit and commercial trip limit should allow limited recreational and commercial harvest of juvenile sheepshead to continue and provide protection to the adult spawning stock. However, these management measures have the potential to increase discards. To minimize potential discards, larger creel and trip limits could be implemented. The magnitude of discards as a result of the management measures presented in this paper should be further examined prior to establishing minimum size, slot, creel, and trip limits.

One option from the 2013 sheepshead issue paper was to manage harvest of sheepshead with a 10-inch (FL) size limit, 10-fish bag limit, and 500-pound trip limit. The size limit is based on the length at which 50 percent of sheepshead reach sexual maturity. This size would reduce the recreational harvest by approximately 18 percent based on landings from 2002 to 2013, but could be as high as 40 percent. The 10-fish bag limit for recreational fishermen would, on average, result in a 5 percent reduction. The 500-pound commercial trip limit would, on average, result in a 25 percent reduction in harvest. There would be some reduction in the impact of the bag limit and trip limit due to the size limit. These management measures will have a negative economic impact in the short term. If the stock is overfished and management measures are sufficient to enable the stock to rebuild, then the future harvest levels will increase and economic losses could be recouped.

Other State Regulations for Sheepshead

Sheepshead are currently managed on a state-by-state basis. The minimum size requirements in effect range from 10 inches FL (or 11 inches TL) in Georgia to 14 inches TL in South Carolina with some states currently not having any size limits (Table 13). Creel limits range from 10 to 20 per person/day. In South Carolina anglers additionally are limited to 30 fish per boat. Commercial trip limits range from 50 pounds as bycatch in a shrimp trawl in Florida to 500 pounds per trip in Virginia. Currently, in North Carolina there are no regulations specific to sheepshead. North Carolina is the only state from New Jersey through Florida with no commercial or recreational regulations for this species.

Table 13. Current state regulations for sheepshead.

State	Size Limit	Recreational Limit	Commercial Limit
New Jersey	None	15 fish Aggregate *	None
Delaware	None	None	None
Maryland	None	20 fish Aggregate*	None
Virginia	None	4/person	500 lb.
North Carolina	None	None	None
South Carolina	13inch FL	10/person; 30/boat	10/person; 30/boat
Georgia	10inch FL	15/person	15/person
Florida	11inch FL	15/person	None / 50 lb.**

* SAFMC 20 fish aggregate bag limit for snapper grouper complex

** FL has no commercial trip limits but does limit bycatch from shrimp trawls only to 50 lbs.

VII. PROPOSED RULE(S)

None

VIII. PROPOSED MANAGEMENT OPTIONS

- A. Status Quo – have no management measures in place at present time – Director was given proclamation authority via Marine Fisheries Commission Rule 15A NCAC 03M .0521. Continue to sample and monitor the species and landings
 - + No rule changes for management of sheepshead
 - Potential for overfishing stock since no regulations are protecting sheepshead

- B. Establish a 10 inch FL minimum size limit with a 20 fish/day bag limit (recreational) and a 500 pound/day/commercial trip limit (28 percent reduction; recreational, 0-70 percent reduction; commercial)
 - + Can protect ~50 percent of juvenile fish from harvest
 - + Establishes management measures for partial protection of spawning stock
 - + Process in place to change regulations for management of sheepshead; Director now has proclamation authority
 - Economic impact on recreational and commercial fisheries

- C. Establish a 12 inch FL minimum size limit with a 10 fish/day bag limit (44.9 percent reduction)
 - + Can protect ~80 percent of juvenile fish from harvest
 - + Establishes management measures for protection of the majority of spawning stock
 - + Process in place to change regulations for management of sheepshead
 - Economic impact on recreational and commercial fisheries

- D. Establish a 14 inch FL minimum size limit with a 10 fish/day bag recreational limit (61.1 percent reduction –largest reduction)
 - + Can protect ~100 percent of juvenile fish from harvest
 - + Establishes management measures for protection of the spawning stock
 - + Process in place to change regulations for management of sheepshead
 - Economic impact on recreational and commercial fisheries

- E. Establish a 12 inch to 20 inch FL recreational slot limit with a 500 pound commercial trip limit (~40 to 60 percent reduction)
 - + Can protect ~80 percent of juvenile fish from harvest
 - + Protects larger and older sheepshead outside of slot limit for spawning
 - + Establishes management measures for protection of the spawning stock
 - + Process in place to change regulations for management of sheepshead
 - Economic impact on recreational and commercial fisheries
 - State could implement regulations that may not be optimal for fishermen
 - Discards of fish over the maximum size limit

- F. Recommend Division develop a fishery management plan for sheepshead.
 - + Stock assessment could be completed
 - + More time to collect and review data on NC sheepshead
 - + Migration study could be done to see if stock is localized
 - Data would not be collected from all states where harvest occurs
 - Localized depletions could still occur
 - State could implement regulations that may not be optimal for fishermen

Any of the above options can add a trip limit for the commercial sector.
 Any other suggested management options may follow.

IX. RECOMMENDATION

Southern Regional Advisory Committee – Recommend a recreational 12-inch FL size limit, 10 fish bag limit, 500 pound commercial trip limit, with a 100 pound/vessel trip limit for spearfishing sheepshead, develop a Fishery Management Plan and do a stock assessment for more information and to ask the Marine Fishery Commission to immediately look at the spotlight/spearfishing issue.

Northern Regional Advisory Committee – Recommend to endorse proposed management Option A, status quo with no rule changes for management of sheepshead, but charge the division with collecting data necessary to determine trends in the population and to develop a stock assessment, if one is necessary.

Finfish Advisory Committee – Status Quo and request the Division gather data on catch per unit effort and size structure through time for both the commercial and recreational fishery and other pertinent data that could identify the status of the NC sheepshead fishery and that this information be presented to the MFC at their May meeting.

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N.C. Marine Fisheries Commission 2014-2015 Annual Rulemaking Cycle

May 2015

Time of Year	Action
January 2014	Last opportunity for a new issue to be presented to DMF Rules Advisory Team
February 2014	Second review by DMF Rules Advisory Team
January-July 2014	Fiscal analysis of rules prepared by DMF staff and approved by Office of State Budget and Management
August 2014	MFC considers approval of Notice of Text for Rulemaking
October 2014	Publication of proposed rules in the North Carolina Register
October 2014	Public hearing(s) held
(January)	(Last opportunity for a new issue to be presented to DMF Rules Advisory Team)
(February)	(Second review by DMF Rules Advisory Team)
February 2015	MFC considers approval of permanent rules
March/April 2015	New rulebook formatted
April 15, 2015	Commercial license sales begin
April 16, 2015	Rules reviewed by Office of Administrative Hearings Rules Review Commission
Late April	New rulebook published
May 1, 2015	New rulebook available online and for distribution
May 1, 2015	Effective date of new rules

N.C. Marine Fisheries Commission 2015-2016 Annual Rulemaking Cycle

May 2015

Time of Year	Action
January 2015	Last opportunity for a new issue to be presented to DMF Rules Advisory Team
February 2015	Second review by DMF Rules Advisory Team
February-April 2015	Fiscal analysis of rules prepared by DMF staff and approved by Office of State Budget and Management
May 2015	MFC considers approval of Notice of Text for Rulemaking
August 2015	Publication of proposed rules in the North Carolina Register
September 2015	Public hearing(s) held
November 2015	MFC considers approval of permanent rules
January 2016	Rules reviewed by Office of Administrative Hearings Rules Review Commission
(January)	(Last opportunity for a new issue to be presented to DMF Rules Advisory Team)
(February)	(Second review by DMF Rules Advisory Team)
February 1, 2016	Earliest possible effective date of rules
February/March 2016	Rulebook supplement prepared
April 1, 2016	Actual effective date of new rules
April 1, 2016	Rulebook supplement available online and for distribution
April 15, 2016	Commercial license sales begin

Regulatory Impact Analysis of the N.C. Striped Mullet Fishery Management Plan Amendment 1:

Name of Commission: N.C. Marine Fisheries Commission

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Impact Summary: State government: No
Local government: No
Federal government: No
Substantial impact: No

Authority: N.C. General Statutes 113-134 (Rules); 113-182 (Regulation of Fishing and Fisheries); 113-221.1 (Proclamations; Emergency Review); 143B-289.52 (Marine Fisheries Commission – Powers and Duties); 15A NCAC 03J .0103 (Gill Nets, Seines, Identification, Restrictions); 03R .0112 (Attended Gill Net Areas)

Necessity: In accordance with G.S. 113-182.1 (b) and (d), the proposed rule changes (see proposed rule text in the appendix) are necessary to amend and update the N.C. Striped Mullet Fishery Management Plan (FMP) to ensure adequate management of the striped mullet resource and striped mullet fisheries occurring in state waters. Specifically, the rule changes address two separate issues and propose to:

- 1) Modify 15A NCAC 03J .0103 to establish restrictions for using runaround or non-stationary gill nets to address user conflicts occurring in confined creeks and in the vicinity of docks and marinas between commercial fishermen using runaround gill nets, recreational anglers, and shoreline residents. Additional changes are proposed to update gill net restrictions that have historically been put in place by the Fisheries Director's proclamation authority. These restrictions are aimed at protecting fish stocks and are also in place to protect endangered species to satisfy provisions for federal Incidental Take Permits.
- 2) Modify 15A NCAC 03R .0112 to remove the Newport River Trawl Net Prohibited Area as a small mesh gill net attendance area in the fall months (September through November), thereby making attendance requirements consistent with other similar areas of the state.

1. Management Measures to Address User Conflicts in the Striped Mullet Runaround Gill Net Fishery and to Put Yardage Restrictions Aimed at Protecting Fish Stocks and Measures as Specified in Incidental Take Permits Into Rule (15A NCAC 03J .0103)

I. Summary

For several years, conflict has at times existed between commercial runaround gill net fishermen, recreational anglers, and shoreline residents. The conflict primarily involves the

blocking of navigation in waterways, competition for limited space in creeks, and a real or perceived reduction in the number of fish available to recreational fishermen during and after runaround gill net operations have taken place. Proposed rule changes seek to implement management measures similar to those already in place for set gill nets to establish restrictions for using runaround or non-stationary gill nets to address user conflicts occurring in confined creeks and in the vicinity of docks and marinas. These measures will make it unlawful to block more than two-thirds of any natural or manmade waterway, sound, bay, creek, inlet or any other body of water; or in a location where it will interfere with navigation or with existing, traditional uses of the area. Additionally, proposed rule changes seek to update the maximum gill net yardage and mesh length restrictions that have historically been put in place via the Fisheries Director's proclamation authority. These restrictions are aimed at protecting fish stocks and are also in place to protect endangered species to satisfy the terms of federal Incidental Take Permits (ITPs.)

II. Introduction and Purpose of Rule Changes

The change in inshore striped mullet fishing practices from traditional passive soak set gill nets to active tower boats with runaround gill nets has created conflicts with marinas, shoreline residents, and recreational anglers. Setting of gill nets around private piers and in restricted navigation areas as well as disruptive fishing practices associated with night fishing have resulted in charges against some striped mullet fishermen of impeding navigation and disturbing the peace. The situation has resulted in petitions for rulemaking asking the N.C. Marine Fisheries Commission (NCMFC) for varying degrees of gill net exclusion from specific areas. In regards to these issues, the recommendation in the 2006 N.C. Striped Mullet FMP was to move forward with the mediation process to resolve conflicts between commercial striped mullet fishermen, recreational anglers, and shoreline residents. In many cases, mediation has not brought satisfactory long-term results for all parties involved.

Competition and conflict in the striped mullet fishery typically occurs in the fall and winter in years when the abundance of striped mullet is high. The N.C. Division of Marine Fisheries (NCDMF) has received an increased number of complaints of conflicts between commercial gill net fishermen, recreational anglers and shoreline residents mainly from creeks where runaround gill nets have encircled schools of striped mullet or spotted sea trout and displaced or blocked access to boaters, anglers, and residents' docks. Several requests have been made since the completion of the 2006 N.C. Striped Mullet FMP to close certain creeks to commercial gill netting in response to user conflicts.

Recognizing the need to resolve this particular conflict in a manner that does not violate the public trust rights of the fishermen and addresses the residents' complaints, the N.C. Striped Mullet FMP Amendment 1 proposes the amendment of 15A NCAC 03J .0103 to add regulations for runaround or non-stationary gill nets similar to those that are already in place under 15A NCAC 03J .0101 for fixed or stationary nets. This would make it unlawful to block more than two-thirds of any natural or manmade waterway, sound, bay, creek, inlet or any other body of water, in a location where it will interfere with navigation, or with existing traditional uses of the area. This is intended to reduce the primary conflict of competition for limited space in creeks. Other conflicts such as lights, noise, and trespassing on private property by netters will continue to be handled on a case-by-case basis.

Additional changes are proposed to 15A NCAC 03J .0103, specifically to the section providing the Fisheries Director's proclamation authority. Amendments include establishing a specified maximum gill net mesh length of six and one-half inches and a specified maximum gill net

yardage of 2,000 yards for gill nets with a mesh length of 4 inches or greater for Internal Coastal Waters that can be put in place via proclamation.

Since 2007, a maximum gill net mesh length of six and one-half inches has been implemented for Internal Coastal Waters by proclamation, beginning with Proclamation FF-15-2007. The proclamations have been issued under the existing authority of the Fisheries Director in 15A NCAC 03J .0103. This mesh length was initially implemented for enforcement and to prevent “cheating” across area quota boundaries in the striped bass fishery; the maximum mesh length has never been greater than six and one-half inches since 2007 and is not expected to ever increase. The most current proclamation (M-1-2014) makes it unlawful to use or possess gill nets with a mesh length of more than six and one-half inches. The stated intent of this proclamation is to allow harvest of flounder and shad while reducing the taking of red drum and striped bass in Internal Coastal Waters. Proposed rule changes constrain the Fisheries Director’s proclamation authority by adding the maximum allowed mesh length that can be implemented, instead of providing the authority to specify any gill net mesh length.

Additionally, part of the proposed rule change regarding proclamation authority to “specify time” has been put forth as part of an ongoing attempt to standardize rule language granting proclamation authority across NCMFC rules. NCDMF staff has identified that proclamation authority across several rules is often similar in nature; however, the specific rule language stating the proclamation authority often differs greatly from rule to rule. In an attempt to improve consistency across rules and public clarity of proclamation authority, NCDMF seeks to standardize rule language describing proclamation authority when possible. The wording for this standard language is based on management measures found in Paragraph (a) of N.C. General Statute 113-182 (Regulation of fishing and fisheries) which states:

“The Marine Fisheries Commission is authorized to authorize, license, regulate, prohibit, prescribe, or restrict all forms of marine and estuarine resources in coastal fishing waters with respect to:

- (1) Time, place, character, or dimensions of any methods or equipment that may be employed in taking fish;
- (2) Seasons for taking fish;
- (3) Size limits on and maximum quantities of fish that may be taken, possessed, bailed to another, transported, bought, sold, or given away.”

The rule change specifying time is not intended to alter the scope of the proclamation authority, nor is it being proposed with the intention of changing current management.

In 2010, the NCDMF began issuing proclamations (M-8-2010) to suspend paragraph (i) (1) of the current iteration of 15A NCAC 03J .0103 and implement a reduced maximum gill net yardage that can be used per vessel in Internal Coastal Waters. The intent of this proclamation was to implement gill net restrictions while the NCDMF applied for a statewide ITP for the anchored gill net fishery from the National Marine Fisheries Service under Section 10(a)(1)(B) of the Endangered Species Act. The NCMFC has approved the Fisheries Director re-suspending this portion of the rule and re-implementing the reduced maximum gill net yardage of 2,000 yards (instead of 3,000 yards) following each NCMFC meeting since 2010. This has continued as part of the ITP and the N.C. Southern Flounder FMP. The current proclamation (M-49-2014) makes it “unlawful to use or possess more than 2,000 yards of gill net with a stretched mesh length of four inches to six and one-half inches per operation.” Proposed rule changes constrain the Fisheries Director’s proclamation authority by adding the maximum allowed net

length that can be implemented at 2,000 yards, instead of providing the authority to specify any net length. In relation to this, additional proposed changes remove the current maximum net length of 3,000 yards from the rule.

These changes will help clarify the location of the current regulations. To reduce confusion for the public, the proposed changes clearly identify these regulations that would be contained in a proclamation, not in a rule that may or may not have been suspended. Additional minor changes are proposed for consistent capitalization, to spell out numbers and for consistent use of terms.

III. Costs

In 2013, there were 422 participants in the commercial runaround gill net fishery that took 3,787 trips and recorded \$1,385,311 in landings. It is unclear how many of these trips would be affected by the new requirements provided in the proposed rule changes, but the overall effect is expected to be minor. Costs may be imposed to some participants in the runaround gill net fishery through requirements that may decrease the efficiency of the gear in some specific and limited cases. While not quantifiable, these costs are expected to be minimal, as the gear will still be allowed in areas previously open to such gear and the gear is still allowed to be set to block up to two-thirds of a waterway.

Yardage and mesh length restrictions will not impact fishermen using runaround gill nets, as this gear is currently limited to a mesh length of less than 5 inches and no more than 800 yards of gill net per commercial operation via proclamation M-39-2014. In the past, some commercial participants using set gill nets have been documented using mesh lengths greater than six and one half inches and more than 2,000 yards of gill net by the NCDMF. The total number of commercial participants that utilized mesh lengths greater than six and one half inches and more than 2,000 yards of set gill net per vessel before these restrictions were put in place by proclamation is unknown. The maximum mesh length and yardage restrictions have been in place for several years and it is unknown if or how many participants would revert to using gear above the current limits should the proposed rule change not be implemented and these restrictions be eliminated.

Without the proposed rule change, participants would still be capped at using no more than 3,000 yards of set gill net per vessel and the Director would still retain proclamation authority to limit both mesh length and net length. As such, existing restrictions would most likely remain in place to avoid non-compliance with both the sea turtle and sturgeon ITPs. Maintaining the restrictions agreed upon in the ITPs helps avoid suspension or revocation of these permits which could lead to the partial or full closure of gill net fishing in internal coastal waters in North Carolina. Therefore, it is expected that the proposed rule language to limit mesh size and maximum yardage of gill nets per vessel will not change current management and will likely impose minimal to no costs. Additional changes made for clarification of the rule are not expected to incur any costs.

IV. Benefits

Dock owners, recreational anglers, and other boaters attempting to use coastal creeks will benefit from the preserved ability to safely navigate these creeks without running into runaround gill net gear. Commercial fishermen may experience some benefit as well through fewer occurrences of vessels hitting and damaging their gear. Also, this rule may cut down on the need for the mediation process, which at times can be lengthy and take a great deal of time for

the parties involved to complete. Overall, these changes are expected to reduce user conflicts in public waters. As such, there may be some time savings to NCDMF staff by not having to field as many complaints stemming from such conflicts, but the benefit to the division is expected to be negligible.

Additionally, rule changes to amend the Fisheries Director's proclamation authority will clarify for the public the content and location of regulations on maximum set gill net mesh length and total yardage that can be fished per vessel. Maximum yardage and mesh length restrictions help preserve spawning stocks for certain species of fish, overall fish populations, and related fisheries. Also, these limits help decrease the chances of interactions with sea turtles and sturgeon protected under the Endangered Species Act, benefitting the populations of these animals and also helping to prevent early regional gill net closures due to allowable takes in the ITPs being reached.

2. Newport River Gill Net Attendance Measures (15A NCAC 03R .0112)

I. Summary

An inconsistency in the area of the upper Newport River that is designated as both a trawl nets prohibited area (TNPA) and special secondary nursery area and the likely unintended implications to small mesh gill net attendance in the affected area has been brought forth as part of the proposed N.C. Striped Mullet FMP Amendment 1. Amendments are proposed to 15A NCAC 03R .0112 to correct the inconsistency between the current rule and what is believed to be the intended gill net attendance requirement for this area brought about by the designation of the Newport River TNPA as a small mesh gill net attendance area. Specifically, rule changes are proposed that would remove the attendance requirement for gill nets with a mesh length of less than five inches that are set within 50 yards of shore in the upper Newport River during the months of October and November.

II. Introduction and Purpose of Rule Changes

As a result of the 2006 N.C. Shrimp FMP, a portion of the Newport River upstream of the line from Hardesty Farm subdivision to Penn Point (Hardesty Farm line) was designated a TNPA in 15A NCAC 03R .0106 (7). Whereas this designation served the desired purpose of prohibiting shrimp trawling upstream of that line, it was implemented without consideration of the existing special secondary nursery area designation which allows for seasonal opening of an area now inside a TNPA. In 2011, the Newport River TNPA was also added to the small mesh gill net attendance areas in 15A NCAC 03R .0112 (b) (1) and it is believed that the implication to the small mesh set gill net fishery that often targets striped mullet was not considered (Figure 1.)

While examining a request to remove the TNPA designation to address the inconsistency with the special secondary nursery area designation as part of the 2011 review of the N.C. Shrimp FMP, NCDMF staff discussed the perceived unintended consequences to small mesh gill net attendance caused by the TNPA designation in 15A NCAC 03R .0112. Rule 15A NCAC 03J .0103 (h) requires gill nets with a mesh length of less than five inches ("small mesh") to be attended from May 1 through November 30 in areas designated in 15A NCAC 03R .0112 (b). In 15A NCAC 03R .0112 (b), there are two provisions applicable to Newport River: sub-paragraph (1) which requires attendance from May 1 through November 30 in primary and permanent secondary nursery areas and several TNPAs including the Newport River TNPA; and sub-paragraph (5) which describes the areas where attendance is required within 50 yards of any

shoreline east of a line in Pamlico Sound except in the area from Core Sound to the South Carolina line from October 1 through November 30. Small mesh gill net attendance is required from May 1 through November 30 in Newport River upstream of the Hardesty Farm line according to 15A NCAC 03R .0112 (b) (1). However, this rule eliminates a striped mullet set gill net fishery that has been occurring there in the fall for many years. NCDMF staff and Marine Patrol officers did not feel small mesh gill net attendance was intended in this area and have not enforced the Newport River TNPA portion of 15A NCAC 03R .0112 (b) (1). Rather, 15A NCAC 03R .0112 (b) (5) has been interpreted to allow small mesh gill nets to be left unattended from October 1 to November 30, and thus, allows the traditional striped mullet set gill net fishery to occur. A recommendation from the 2011 review of the N.C. Shrimp FMP was for the shrimp trawl line to remain as shown by the Newport River TNPA, but to attempt to resolve the rule language in 15A NCAC 03R .0112 (b) in the N.C. Striped Mullet FMP amendment process so the small mesh set gill net striped mullet fishery can continue in the fall of each year.

Measures are being proposed within 15A NCAC 03R .0112 to correct the inconsistency between the current rule and what is believed to be the intended small mesh set gill net attendance requirements for this area brought about by the designation of the Newport River TNPA as a small mesh gill net attendance area. Specifically, rule changes are proposed that would allow a section of the upper Newport River to fall under the provisions of 15A NCAC 03R .0112 (b)(5), thereby removing the attendance requirement for set gill nets with a mesh length of less than five inches that are set within 50 yards of shore during the months of October and November.

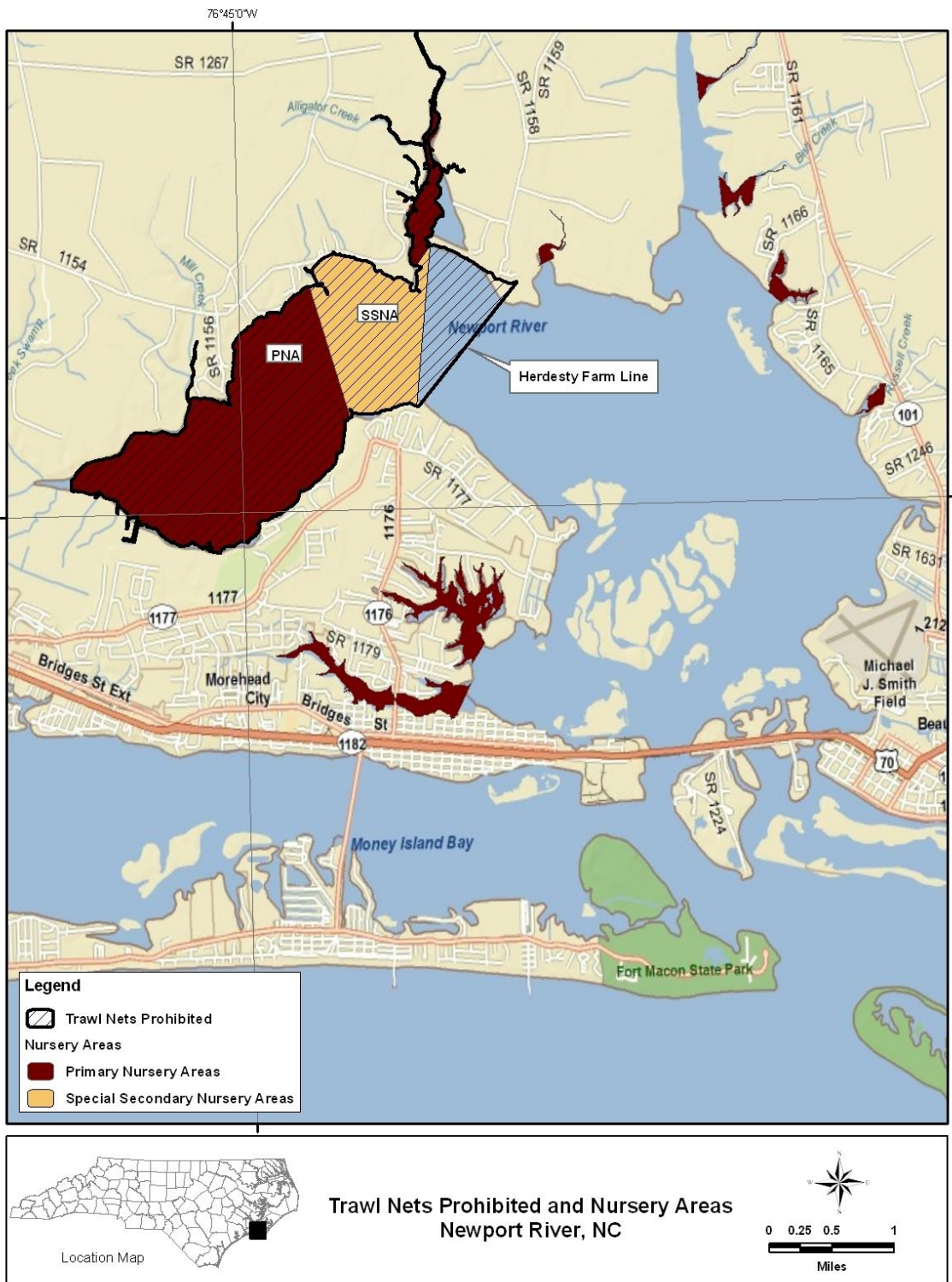


Figure 1. Existing nursery areas and trawl nets prohibited areas in the Newport River.

III. Costs

The proposed rule change may incur some costs by allowing the small mesh gill net fishery in a section of the upper Newport River to continue without attendance requirements. This facilitates the use of this gear and increases the chance for some level of user conflict over the fishery resources present in the area. Overall costs are expected to be negligible.

IV. Benefits

Implementing the proposed rule change in 15A NCAC 03R .0112 would allow the small mesh set gill net fishery occurring in the upper section of the Newport River during the fall months to continue without attendance requirements. Requiring attendance of this gear would implement an unquantified opportunity cost to participants choosing to use this gear, as they would need to remain present with the nets while they are in the water. This additional opportunity cost may cause participants to reduce fishing effort or quit fishing in the specified area. While data are not available specific to the area that would be affected, small mesh set gill net landings in the entire Newport River system in October and November combined from 2009 to 2013 have ranged from approximately \$700 to \$6,150 and averaged approximately \$3,000 annually. This serves as a conservatively high estimate of possible benefits and represents the upper limit of benefits to commercial participants from removing attendance requirements for small mesh set gill nets in the specified portion of the upper Newport River. Additionally, the rule change will improve public clarity of 15A NCAC 03R .0112.

3. Comprehensive Statement of Costs and Benefits

Rule changes associated with the N.C. Striped Mullet Fishery Management Plan Amendment 1 are expected to be well below the substantial economic impact threshold of \$1 million in aggregate costs and benefits in a 12-month period. Specifically:

1) Modifying 15A NCAC 03J .0103 may incur some costs by decreasing the efficiency of runaround gill net operations under specific and limited conditions. Additionally, some costs could theoretically be incurred by the 2,000-yard cap on total set gill net yardage for gill nets with a mesh length of four inches and greater that can be fished by a vessel at any one time, should the provision implemented as part of the ITPs for the set gill net fishery occurring in internal coastal waters be removed. Realized costs are expected to be minimal to nonexistent, as current gill net restrictions will likely remain in place to maintain compliance with the ITPs should the proposed rule change not be implemented. Benefits will be incurred through possible decreased incidences of conflict among users of public waters and the need to undergo conflict mediation, a decreased likelihood of damaged commercial gear, and improved clarity on the content and location of regulations on maximum gill net mesh length and total yardage that can be fished per vessel. While unquantified, all anticipated costs and benefits are expected to be minimal in monetary terms.

2) Modifying 15A NCAC 03R .0112 may incur some minimal costs by increasing the possibility of conflict among user groups in a section of the upper Newport River. While the exact benefit is unknown, the proposed rule change will allow the small mesh set gill net fishery in the upper Newport River to continue without attendance requirements during the months of October and November. This will help minimize opportunity costs for participants in this fishery. The small mesh set gill net fishery in the entire Newport River has recorded landings ranging from \$700 to \$6,150 in the months of October and November combined from 2009-2013.

Table 1. Summary of estimated annual costs and benefits from proposed rule changes.

Rule	Annual Estimated Cost	Annual Estimated Benefit
15A NCAC 03J .0103	Unquantified	Unquantified
15A NCAC 03R .0112	None	\$0 to \$6,150

Appendix: Proposed Rule Changes

15A NCAC 03J .0103 GILL NETS, SEINES, IDENTIFICATION, RESTRICTIONS

(a) It is unlawful to use gill nets:

- (1) ~~With~~ with a mesh length less than ~~2 1/2~~ two and one-half inches.
- (2) ~~In internal waters in~~ Internal Coastal Waters from April 15 through December 15, with a mesh length ~~5~~ five inches or greater and less than ~~5 1/2~~ five and one-half inches.

(b) The Fisheries Director may, by proclamation, limit or prohibit the use of gill nets or seines in ~~coastal waters, Coastal Fishing Waters,~~ Coastal Fishing Waters, or any portion thereof, or impose any or all of the following restrictions on gill net or seine fishing operations:

- ~~(1) Specify area.~~
- ~~(2) Specify season.~~
- ~~(3) Specify gill net mesh length.~~
- ~~(4) Specify means/methods.~~
- ~~(5) Specify net number and length.~~

- (1) specify time;
- (2) specify area;
- (3) specify means and methods, including:
 - (A) gill net mesh length, but the maximum length specified shall not exceed six and one-half inches in Internal Coastal Waters; and
 - (B) net number and length, but for gill nets with a mesh length four inches or greater, the maximum length specified shall not exceed 2,000 yards per vessel in Internal Coastal Waters regardless of the number of individuals involved; and
- (4) specify season.

(c) It is unlawful to use fixed or stationary gill nets in the Atlantic Ocean, drift gill nets in the Atlantic Ocean for recreational purposes, or any gill nets in ~~internal waters~~ Internal Coastal Waters unless nets are marked by attaching to them at each end two separate yellow buoys which shall be of solid foam or other solid buoyant material no less than five inches in diameter and no less than five inches in length. Gill nets, which are not connected together at the top line, are considered as individual nets, requiring two buoys at each end of each individual net. Gill nets connected together at the top line are considered as a continuous net requiring two buoys at each end of the continuous net. Any other marking buoys on gill nets used for recreational purposes shall be yellow except one additional buoy, any shade of hot pink in color, constructed as specified in this Paragraph, shall be added at each end of each individual net. Any other marking buoys on gill nets used in commercial fishing operations shall be yellow except that one additional identification buoy of any color or any combination of colors, except any shade of hot pink, may be used at either or both ends. The owner shall be identified on a buoy on each end either by using engraved buoys or by attaching engraved metal or plastic tags to the buoys. Such identification shall include owner's last name and initials and if a vessel is used, one of the following:

- (1) ~~Owner's~~ owner's N.C. motor boat registration ~~number,~~ number; or
- (2) ~~Owner's~~ owner's U.S. vessel documentation name.

(d) It is unlawful to use gill nets:

- (1) ~~Within~~ within 200 yards of any flounder or other finfish pound net set with lead and either pound or heart in use, except from August 15 through December 31 in all ~~coastal fishing waters~~ Coastal Fishing Waters of the Albemarle Sound, including its tributaries to the boundaries between ~~coastal and joint fishing waters, Coastal and Joint Fishing Waters,~~ west of a line beginning at a point 36° 04.5184' N - 75° 47.9095' W on Powell Point; running southerly to a point 35° 57.2681' N - 75° 48.3999' W on Caroon Point, it is unlawful to use gill nets within 500 yards of any pound net set with lead and either pound or heart in use; and
- (2) ~~From~~ from March 1 through October 31 in the Intracoastal Waterway within 150 yards of any railroad or highway bridge.

(e) It is unlawful to use gill nets within 100 feet either side of the center line of the Intracoastal Waterway Channel south of the entrance to the Alligator-Pungo River Canal near Beacon "54" in Alligator River to the South Carolina line, unless such net is used in accordance with the following conditions:

- (1) ~~No~~no more than two gill nets per vessel may be used at any one time;
- (2) ~~Any~~any net used must be attended by the fisherman from a vessel who shall at no time be more than 100 yards from either net; and
- (3) ~~Any~~any individual setting such nets shall remove them, when necessary, in sufficient time to permit unrestricted ~~boat~~vessel navigation.

(f) It is unlawful to use ~~drift gill nets in violation of 15A NCAC 03J .0101(2) and Paragraph (e) of this Rule.~~ runaround, drift, or other non-stationary gill nets, except as provided in subparagraph (e) of this rule:

- (1) to block more than two-thirds of any natural or manmade waterway, sound, bay, creek, inlet or any other body of water; or
- (2) in a location where it will interfere with navigation or with existing, traditional uses of the area other than navigation.

(g) It is unlawful to use unattended gill nets with a mesh length less than five inches in a commercial fishing operation in the gill net attended areas designated in 15A NCAC 03R .0112(a).

(h) It is unlawful to use unattended gill nets with a mesh length less than five inches in a commercial fishing operation from May 1 through November 30 in the ~~internal coastal and joint waters~~ Internal Coastal Waters and Joint Fishing Waters of the state designated in 15A NCAC 03R .0112(b).

(i) ~~For gill nets with a mesh length five inches or greater, it is unlawful:~~

- (1) ~~To use more than 3,000 yards of gill net per vessel in internal waters regardless of the number of individuals involved.~~
- (2) ~~From June through October, for any portion of the net to be within 10 feet of any point on the shoreline while set or deployed, unless the net is attended.~~

(i) It is unlawful for any portion of a gill net with a mesh length five inches or greater to be within 10 feet of any point on the shoreline while set or deployed, unless the net is attended from June through October in Internal Coastal Waters.

(j) For the purpose of this Rule and 15A NCAC 03R .0112, shoreline is defined as the mean high water line or marsh line, whichever is more seaward.

Authority G.S. 113-134; 113-173; 113-182; 113-221; 143B-289.52

15A NCAC 03R .0112 ATTENDED GILL NET AREAS

(a) The attended gill net areas referenced in 15A NCAC 03J .0103(g) are delineated in the following areas:

- (1) Pamlico River, west of a line beginning at a point 35° 27.5768' N - 76° 54.3612' W on Ragged Point; running southwesterly to a point 35° 26.9176' N - 76° 55.5253' W on Mauls Point;
- (2) Within 200 yards of any shoreline in Pamlico River and its tributaries east of a line beginning at a point 35° 27.5768' N - 76° 54.3612' W on Ragged Point; running southwesterly to a point 35° 26.9176' N - 76° 55.5253' W on Mauls Point; and west of a line beginning at a point 35° 22.3622' N - 76° 28.2032' W on Roos Point; running southerly to a point at 35° 18.5906' N - 76° 28.9530' W on Pamlico Point;
- (3) Pungo River, east of the northern portion of the Pantego Creek breakwater and a line beginning at a point 35° 31.7198' N - 76° 36.9195' W on the northern side of the breakwater near Tooleys Point; running southeasterly to a point 35° 30.5312' N - 76° 35.1594' W on Durants Point;
- (4) Within 200 yards of any shoreline in Pungo River and its tributaries west of the northern portion of the Pantego Creek breakwater and a line beginning at a point 35° 31.7198' N - 76° 36.9195' W on the northern side of the breakwater near Tooleys Point; running southeasterly to a point 35° 30.5312' N - 76° 35.1594' W on Durants Point; and west of a line beginning at a point 35° 22.3622' N - 76° 28.2032' W on Roos Point; running southerly to a point at 35° 18.5906' N - 76° 28.9530' W on Pamlico Point;
- (5) Neuse River and its tributaries northwest of the Highway 17 highrise bridge;

- (6) Trent River and its tributaries; and
 - (7) Within 200 yards of any shoreline in Neuse River and its tributaries east of the Highway 17 highrise bridge and south and west of a line beginning on Maw Point at a point 35° 09.0407' N - 76° 32.2348' W; running southeasterly near the Maw Point Shoal Marker "2" to a point 35° 08.1250' N - 76° 30.8532' W; running southeasterly near the Neuse River Entrance Marker "NR" to a point 35° 06.6212' N - 76° 28.5383' W; running southerly to a point 35° 04.4833' N - 76° 28.0000' W near Point of Marsh in Neuse River. In Core and Clubfoot creeks, the Highway 101 Bridge constitutes the attendance boundary.
- (b) The attended gill net areas referenced in 15A NCAC 03J .0103(h) are delineated in the following ~~coastal and joint waters~~ Coastal and Joint Fishing Waters of the state south of a line beginning on Roanoke Marshes Point at a point 35° 48.3693' N - 75° 43.7232' W; running southeasterly to a point 35° 44.1710' N - 75° 31.0520' W on Eagles Nest Bay to the South Carolina State line:
- (1) All primary nursery areas described in 15A NCAC 03R .0103, all permanent secondary nursery areas described in 15A NCAC 03R .0104, and no-trawl areas described in 15A NCAC 03R .0106(2), (4), (5), ~~(7)~~, (8), (10), (11), and (12);
 - (2) In the area along the Outer Banks, beginning at a point 35° 44.1710' N - 75° 31.0520' W on Eagles Nest Bay; running northwesterly to a point 35° 45.1833' N - 75° 34.1000' W west of Pea Island; running southerly to a point 35° 40.0000' N - 75° 32.8666' W west of Beach Slough; running southeasterly and passing near Beacon "2" in Chicamicomico Channel to a point 35° 35.0000' N - 75° 29.8833' W west of the Rodanthe Pier; running southwestly to a point 35° 28.4500' N - 75° 31.3500' W on Gull Island; running southerly to a point 35° 22.3000' N - 75° 33.2000' W near Beacon "2" in Avon Channel ; running southwestly to a point 35° 19.0333' N - 75° 36.3166' W near Beacon "2" in Cape Channel; running southwestly to a point 35° 15.5000' N - 75° 43.4000' W near Beacon "36" in Rollinson Channel; running southeasterly to a point 35° 14.9386' N - 75° 42.9968' W near Beacon "35" in Rollinson Channel; running southwestly to a point 35° 14.0377' N - 75° 45.9644' W near a "Danger" Beacon northwest of Austin Reef; running southwestly to a point 35° 11.4833' N - 75° 51.0833' W on Legged Lump; running southeasterly to a point 35° 10.9666' N - 75° 49.7166' W south of Legged Lump; running southwestly to a point 35° 09.3000' N - 75° 54.8166' W near the west end of Clarks Reef; running westerly to a point 35° 08.4333' N - 76° 02.5000' W near Nine Foot Shoal Channel; running southerly to a point 35° 06.4000' N - 76° 04.3333' W near North Rock; running southwestly to a point 35° 01.5833' N - 76° 11.4500' W near Beacon "HL"; running southerly to a point 35° 00.2666' N - 76° 12.2000' W; running southerly to a point 34° 59.4664' N - 76° 12.4859' W on Wainwright Island; running easterly to a point 34° 58.7853' N - 76° 09.8922' W on Core Banks; running northerly along the shoreline and across the inlets following the Colregs Demarcation line to the point of beginning;
 - (3) In Core and Back sounds, beginning at a point 34° 58.7853' N - 76° 09.8922' W on Core Banks; running northwesterly to a point 34° 59.4664' N - 76° 12.4859' W on Wainwright Island; running southerly to a point 34° 58.8000' N - 76° 12.5166' W; running southeasterly to a point 34° 58.1833' N - 76° 12.3000' W; running southwestly to a point 34° 56.4833' N - 76° 13.2833' W; running westerly to a point 34° 56.5500' N - 76° 13.6166' W; running southwestly to a point 34° 53.5500' N - 76° 16.4166' W; running northwesterly to a point 34° 53.9166' N - 76° 17.1166' W; running southerly to a point 34° 53.4166' N - 76° 17.3500' W; running southwestly to a point 34° 51.0617' N - 76° 21.0449' W; running southwestly to a point 34° 48.3137' N - 76° 24.3717' W; running southwestly to a point 34° 46.3739' N - 76° 26.1526' W; running southwestly to a point 34° 44.5795' N - 76° 27.5136' W; running southwestly to a point 34° 43.4895' N - 76° 28.9411' W near Beacon "37A"; running southwestly to a point 34° 40.4500' N - 76° 30.6833' W; running westerly to a point 34° 40.7061' N - 76° 31.5893' W near Beacon "35" in Back Sound; running westerly to a point 34° 41.3178' N - 76° 33.8092' W near Buoy "3"; running southwestly to a point 34° 39.6601' N - 76° 34.4078' W on Shackleford Banks; running easterly and northeasterly along the shoreline and across the inlets following the COLREGS Demarcation lines to the point of beginning;
 - (4) Within 200 yards of any shoreline in the area upstream of the 76° 28.0000' W longitude line beginning at a point 35° 22.3752' N - 76° 28.0000' W near Roos Point in Pamlico River; running southeasterly to a point 35° 04.4833' N - 76° 28.0000' W near Point of Marsh in Neuse River; and

- (5) Within 50 yards of any shoreline east of the $76^{\circ} 28.0000'$ W longitude line beginning at a point $35^{\circ} 22.3752'$ N - $76^{\circ} 28.0000'$ W near Roos Point in Pamlico River; running southeasterly to a point $35^{\circ} 04.4833'$ N - $76^{\circ} 28.0000'$ W near Point of Marsh in Neuse River, except from October 1 through November 30, south and east of Highway 12 in Carteret County and south of a line from a point $34^{\circ} 59.7942'$ N - $76^{\circ} 14.6514'$ W on Camp Point; running easterly to a point at $34^{\circ} 58.7853'$ N - $76^{\circ} 09.8922'$ W on Core Banks; to the South Carolina State Line.

Authority G.S. 113-134; 113-173; 113-182; 113-221.1; 143B-289.52

Regulatory Impact Analysis of Proposed Amendments to Rule 15A NCAC 03R .0108

Clarify Dredges and Mechanical Methods Prohibited Areas for Harvesting Shellfish in Internal Coastal Waters

Name of Commission: N.C. Marine Fisheries Commission

Agency Contact: John Hadley, Fisheries Economics Program Manager
N.C. Division of Marine Fisheries
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Impact Summary: *De minimus* rule change
State government: No
Local government: No
Federal government: No
Substantial impact: No

Authority: N.C. General Statutes 113-134 (Rules); 113-182 (Regulation of Fishing and Fisheries); 15A NCAC 03K .0108 (Dredges/Mechanical Methods Prohibited); 03K .0204 (Dredges/Mechanical Methods Prohibited); 03R .0108 (Mechanical Methods Prohibited)

Necessity: Proposed rule changes to 15A NCAC 03R .0108 align regulations regarding mechanical methods for harvesting shellfish to specify only internal coastal waters as currently managed. This rule change abides by the requirements of G.S. 150B, Administrative Procedure Act, to ensure rules are up to date with the current management practice to aid in the clarity of regulations. These rule changes will more clearly and accurately reflect North Carolina Division of Marine Fisheries operations and management.

I. Summary

To abide by the requirements of G.S. 150B, The Administrative Procedure Act, which seeks to ensure rules are up to date with current management practices to aid in the clarity of regulations, changes are being proposed to 15A NCAC 03R .0108 that specify the rule applies only to internal coastal waters. With ocean waters in North Carolina being closed to harvest of shellfish via federal regulation, the proposed rule changes align regulation of mechanical methods to harvest shellfish with current management practices as well as remove redundant and undefined language in the rule. Rule changes are anticipated to become effective April 1, 2016.

II. Introduction and Purpose of Rule Changes

The prohibition of mechanical methods to take shellfish has a long history of restrictions to areas in internal coastal waters going back to 1887. Currently, all internal coastal waters from Cedar Island to the South Carolina State line and behind the Outer Banks are closed to the mechanical harvest of oysters. Also in July 2004, the North Carolina Marine Fisheries

Commission approved amendments to 15A NCAC 03R .0108 that closed 31,000 acres of the waters around Pamlico Sound and in Roanoke Sound to mechanical oyster harvesting. All descriptive boundaries of this rule are either specific to waterbodies with latitude/longitude coordinates, or name the specific waterbodies and their tributaries, except for the final section referencing counties in the southern area of coastal North Carolina.

Under federal shellfish regulations contained in Chapter IV of the National Shellfish Sanitation Program Guide for the Control of Molluscan Shellfish (Model Ordinance), if waterbodies are not surveyed for pathogens, they must be closed to shellfishing due to the potentially serious health risks associated with eating shellfish. NCDMF does not survey areas in ocean waters for such pathogens due to limited staff and monetary resources as well as lack of public interest in harvesting shellfish in these waters. As a result, these areas are closed to the harvest of shellfish such as clams or oysters, making rule language “any of the coastal waters of” as referenced in 15A NCAC 03R .0108 (4) redundant when referring to ocean waters.

Additionally, it is in the interest of both law enforcement and the public to use terms that are legally defined when specifying areas. The term “coastal water areas” that appears in 15A NCAC 03R .0108 as it is currently written is not a term that is defined by rule or statute. The terms “Internal Coastal Waters” and “Coastal Fishing Waters” are defined by rule and statute respectively. “Internal Coastal Waters” is defined in 15A NCAC 03I .0101 (1) (c) as “All coastal fishing waters except the Atlantic Ocean”. “Coastal Fishing Waters” is defined in G.S. 113-129 (4) as “The Atlantic Ocean; the various coastal sounds; and estuarine waters up to the dividing line between coastal fishing waters and inland fishing waters agreed upon by the Marine Fisheries Commission and the Wildlife Resources Commission...”. The proposed rule changes seek to replace the undefined term of “coastal water areas” with the defined term of “Internal Coastal Waters”, as the specified areas in rule 15A NCAC 03I .0101 reference waters not in the Atlantic Ocean and the ocean waters are already closed via Chapter IV of the Model Ordinance.

The NCDMF abides by the requirements of G.S. 150B, Administrative Procedure Act, to ensure rules are up to date with the current management practice and to aid in the clarity of regulations. Since management of mechanical methods to take shellfish is allowed only in specific areas and ocean waters are closed to the harvest of shellfish, proposed rule changes seek to specify the rule is for internal coastal waters only and to use terms that are defined in rule. For this reason, the proposed rule changes are being put forth to clarify the rule and do not change current management of mechanical harvest of shellfish.

III. Costs

There are no costs associated with the proposed rule changes, as rule changes reflect current management practices.

IV. Benefits

While there are no quantifiable economic benefits to the proposed rule change, the public and law enforcement will benefit from changing rule 15A NCAC 03R .0108 to align with current management practices and to use terms defined in rule.

Appendix: Proposed Rule Changes

15A NCAC 03R .0108 MECHANICAL METHODS PROHIBITED

The dredges and mechanical methods prohibited areas referenced in 15A NCAC 03K .0204 are delineated in the following ~~coastal water areas~~ Internal Coastal Waters:

- (1) In Roanoke Sound and tributaries, south of a line beginning at a point 35° 55.1461' N – 75° 39.5618' W on Baum Point, running easterly to a point 35° 55.9795' N - 75° 37.2072' W and north and east of a line beginning at a point 35° 50.8315' N - 75° 37.1909' W on the west side of the mouth of Broad Creek, running easterly to a point 35° 51.0097' N - 75° 36.6910' W near Beacon "17", running southerly to a point 35° 48.6145' N - 75° 35.3760' W near Beacon "7", running easterly to a point 35° 49.0348' N - 75° 34.3161' W on Cedar Point.
- (2) In Pamlico Sound and tributaries:
 - (a) Outer Banks area, within the area described by a line beginning at a point 35°46.0638' N – 75°31.4385' W on the shore of Pea Island; running southwestly to a point 35°42.9500' N – 75°34.1500' W; running southerly to a point 35°39.3500' N – 75°34.4000' W; running southeasterly to a point 35°35.8931' N – 75°31.1514' W in Chicamacomico Channel near Beacon "ICC"; running southerly to a point 35° 28.5610' N – 75°31.5825' W on Gull Island; running southerly to a point 35° 22.8671' N – 75° 33.5851' W in Avon Channel near Beacon "1"; running southwestly to a point 35°18.9603' N – 75°36.0817' W in Cape Channel near Beacon "2"; running westerly to a point 35°16.7588' N – 75°44.2554' W in Rollinson Channel near Beacon "42RC"; running southwestly to a point 35°14.0337' N – 75°45.9643' W southwest of Oliver Reef near the quick-flashing beacon; running westerly to a point 35°09.3650' N – 76°00.6377' W in Big Foot Slough Channel near Beacon "14BF"; running southwestly to a point 35°08.4523' N – 76°02.6651' W in Nine Foot Shoal Channel near Beacon "9"; running westerly to a point 35°07.1000' N – 76°06.9000; running southwestly to a point 35°01.4985' N – 76°11.4353' W near Beacon "HL"; running southwestly to a point 35°00.2728' N – 76°12.1903' W near Beacon "2CS"; running southerly to a point 34°59.4383' N – 76°12.3541' W in Wainwright Channel immediately east of the northern tip of Wainwright Island; running easterly to a point 34°58.7853' N – 76°09.8922' W on Core Banks; running northerly along the shoreline and across the inlets following the COLREGS Demarcation lines to the point of beginning;
 - (b) Stumpy Point Bay, north of a line beginning at a point 35° 40.9719' N - 75° 44.4213' W on Drain Point; running westerly to a point 35° 40.6550' N - 75° 45.6869' W on Kazer Point;
 - (c) Pains Bay, east of a line beginning at a point 35° 35.0666' N - 75° 51.2000' W on Pains Point, running southerly to a point 35° 34.4666' N – 75° 50.9666' W on Rawls Island; running easterly to a point 35° 34.2309' N - 75° 50.2695' W on the east shore;
 - (d) Long Shoal River, north of a line beginning at a point 35° 35.2120' N - 75° 53.2232' W at the 5th Avenue Canal, running easterly to a point 35° 35.0666' N - 75° 51.2000' W on the east shore on Pains Point;
 - (e) Wysocking Bay:
 - (i) Wysocking Bay, north of a line beginning at a point 35° 25.2741' N - 76° 03.1169' W on Mackey Point, running easterly to a point 35° 25.1189' N - 76°02.0499' W at the mouth of Lone Tree Creek;
 - (ii) Mount Pleasant Bay, west of a line beginning at a point 35° 23.8652' N - 76° 04.1270' W on Browns Island, running southerly to a point 35° 22.9684' N - 76° 03.7129' W on Bensons Point;
 - (f) Juniper Bay, north of a line beginning at a point 35° 22.1384' N - 76° 15.5991' W near the Caffee Bay ditch, running easterly to a point 35° 22.0598' N - 76° 15.0095' W on the east shore;

- (g) Swan Quarter Bay:
 - (i) Cafee Bay, east of a line beginning at a point 35° 22.1944' N - 76° 19.1722' W on the north shore, running southerly to a point 35° 21.5959' N - 76° 18.3580' W on Drum Point;
 - (ii) Oyster Creek, east of a line beginning at a point 35° 23.3278' N - 76° 19.9476' W on the north shore, running southerly to a point 35° 22.7018' N - 76° 19.3773' W on the south shore;
- (h) Rose Bay:
 - (i) Rose Bay, north of a line beginning at a point 35° 25.7729' N - 76° 24.5336' W on Island Point, running southeasterly and passing near Beacon "5" to a point 35° 25.1854' N - 76° 23.2333' W on the east shore;
 - (ii) Tooleys Creek, west of a line beginning at a point 35° 25.7729' N - 76° 24.5336' W on Island Point, running southwesterly to a point 35° 25.1435' N - 76° 25.1646' W on Ranger Point;
- (i) Spencer Bay:
 - (i) Striking Bay, north of a line beginning at a point 35° 23.4106' N - 76° 26.9629' W on Short Point, running easterly to a point 35° 23.3404' N - 76° 26.2491' W on Long Point;
 - (ii) Germantown Bay, north of a line beginning at a point 35° 24.0937' N - 76° 27.9348' W; on the west shore, running easterly to a point 35° 23.8598' N - 76° 27.4037' W on the east shore;
- (j) Abel Bay, northeast of a line beginning at a point 35° 23.6463' N - 76° 31.0003' W on the west shore, running southeasterly to a point 35° 22.9353' N - 76° 29.7215' W on the east shore;
- (k) Pungo River, Fortescue Creek, east of a line beginning at a point 35° 25.9213' N - 76° 31.9135' W on Pasture Point; running southerly to a point 35° 25.6012' N - 76° 31.9641' W on Lupton Point ;
- (l) Pamlico River:
 - (i) North Creek, north of a line beginning at a point 35° 25.3988' N - 76° 40.0455' W on the west shore, running southeasterly to a point 35° 25.1384' N - 76° 39.6712' W on the east shore;
 - (ii) Campbell Creek (off of Goose Creek), west of a line beginning at a point 35° 17.3600' N - 76° 37.1096' W on the north shore; running southerly to a point 35° 16.9876' N - 76° 37.0965' W on the south shore;
 - (iii) Eastham Creek (off of Goose Creek), east of a line beginning at a point 35° 17.7423' N - 76° 36.5164' W on the north shore; running southeasterly to a point 35° 17.5444' N - 76° 36.3963' W on the south shore;
 - (iv) Oyster Creek-Middle Prong, southwest of a line beginning at a point 35° 19.4921' N - 76° 32.2590' W on Cedar Island; running southeasterly to a point 35° 19.1265' N - 76° 31.7226' W on Beard Island Point; and southwest of a line beginning at a point 35° 19.5586' N - 76° 32.8830' W on the west shore, running easterly to a point 35° 19.5490' N - 76° 32.7365' W on the east shore;
- (m) Mouse Harbor, west of a line beginning at a point 35° 18.3915' N - 76° 29.0454' W on Persimmon Tree Point, running southerly to a point 35° 17.1825' N - 76° 28.8713' W on Yaupon Hammock Point;
- (n) Big Porpoise Bay, northwest of a line beginning at a point 35° 15.6993' N - 76° 28.2041' W on Big Porpoise Point, running southwesterly to a point 35° 14.9276' N - 76° 28.8658' W on Middle Bay Point;
- (o) Middle Bay, west of a line beginning at a point 35° 14.8003' N - 76° 29.1923' W on Deep Point, running southerly to a point 35° 13.5419' N - 76° 29.6123' W on Little Fishing Point;
- (p) Jones Bay, west of a line beginning at a point 35° 14.0406' N - 76° 33.3312' W on Drum Creek Point, running southerly to a point 35° 13.3609' N - 76° 33.6539' W on Ditch Creek Point;

- (q) Bay River:
 - (i) Gales Creek-Bear Creek, north and west of a line beginning at a point 35° 11.2833' N - 76° 35.9000' W on Sanders Point, running northeasterly to a point 35° 11.9000' N - 76° 34.2833' W on the east shore;
 - (ii) Bonner Bay, southeast of a line beginning at a point 35° 09.6281' N - 76° 36.2185' W on the west shore; running northeasterly to a point 35° 10.0888' N - 76° 35.2587' W on Davis Island Point;
- (r) Neuse River:
 - (i) Lower Broad Creek, west of a line beginning at a point 35° 05.8314' N - 76° 35.3845' W on the north shore; running southwesterly to a point 35° 05.5505' N - 76° 35.7249' W on the south shore;
 - (ii) Greens Creek - north of a line beginning at a point 35° 01.3476' N - 76° 42.1740' W on the west shore of Greens Creek; running northeasterly to a point 35° 01.4899' N - 76° 41.9961' W on the east shore;
 - (iii) Dawson Creek, north of a line beginning at a point 34° 59.5920' N - 76° 45.4620' W on the west shore; running southeasterly to a point 34° 59.5800' N - 76° 45.4140' W on the east shore;
 - (iv) Clubfoot Creek, south of a line beginning at a point 34° 54.5424' N - 76° 45.7252' W on the west shore, running easterly to a point 34° 54.4853' N - 76° 45.4022' W on the east shore;
 - (v) Turnagain Bay, south of a line beginning at a point 34° 59.4065' N - 76° 30.1906' W on the west shore; running easterly to a point 34° 59.5668' N - 76° 29.3557' W on the east shore;
- (s) West Bay:
 - (i) Long Bay-Ditch Bay, west of a line beginning at a point 34° 57.9388' N - 76° 27.0781' W on the north shore of Ditch Bay; running southwesterly to a point 34° 57.2120' N - 76° 27.2185' W on the south shore of Ditch Bay; then south of a line running southeasterly to a point 34° 56.7633' N - 76° 26.3927' W on the east shore of Long Bay;
 - (ii) West Thorofare Bay, south of a line beginning at a point 34° 57.2199' N - 76° 24.0947' W on the west shore; running easterly to a point 34° 57.4871' N - 76° 23.0737' W on the east shore;
 - (iii) Merkle Bay, east of a line beginning at a point 34° 58.2286' N - 76° 22.8374' W on the north shore, running southerly to a point 34° 57.5920' N - 76° 23.0704' W on Merkle Bay Point;
 - (iv) North Bay, east of a line beginning at a point 35° 01.8982' N - 76° 21.7135' W on Point of Grass, running southeasterly to a point 35° 01.3320' N - 76° 21.3353' W on Western Point.
- (3) In Core Sound and its tributaries, southwest of a line beginning at a point 35° 00.1000' N - 76° 14.8667' W near Hog Island Reef; running easterly to a point 34° 58.7853' N - 76° 09.8922' W on Core Banks; and in the following waterbodies and their tributaries: Back Bay, the Straits, Back Sound, North River, Newport River, Bogue Sound and White Oak River.
- (4) In any of the coastal waters of Onslow, Pender, New Hanover, and Brunswick counties.

Authority G.S. 113-134; 113-182; 143B 289.52;



North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

Donald R. van der Vaart
Secretary

MEMORANDUM

TO: N.C. Marine Fisheries Commission

FROM: Patti Fowler
N.C. Division of Marine Fisheries

DATE: May 4, 2014

SUBJECT: Brad Scott Timeline

At its February 2015 business meeting, the Marine Fisheries Commission requested the Division of Marine Fisheries prepare information regarding the chronology of interactions the division and the commission have had related to the denial of an Aquaculture Operations Permit requested by Mr. Brad Scott.

Please find attached an abridged timeline that goes back to 2007, when the division denied Mr. Scott's application for an Aquaculture Operations Permit. Mr. Scott seeks a permit to culture or grow shellfish seed at the Masonboro Boat Yard, which is a prohibited area polluted with heavy metal contaminants, which are considered poisonous or deleterious substances. The National Shellfish Sanitation Program does allow the nursery of seed in prohibited waters unless those waters contain poisonous or deleterious substances.

There have been numerous exchanges and inquiries regarding Mr. Scott's permit denial from legislators, the Governor's Office, the Department of Environment and Natural Resources, Division of Water Quality, Environmental Health/Pubic Health, the state health director, the state toxicologist, the FDA, the Marine Fisheries Commission and the Shellfish/Crustacean Advisory Committee. Important points in the timeline include:

- A declaratory ruling from the commission in 2008 determining that the rules were properly interpreted and Mr. Scott's permit was properly denied.
- In 2011, Dr. Ken Rudo, the state toxicologist, found elevated levels of arsenic and zinc from oyster samples collected from Masonboro Boat Yard and states he believes consumption over time would pose an increased health risk.
- A 2011 consensus statement from the Marine Fisheries Commission that the nursery of shellfish in prohibited waters to be transferred to leases is an unacceptable practice.
- Review in 2012 by the commission's Shellfish/Crustacean Advisory Committee that resulted in recommendations from several members that Mr. Scott seek another location for his facility.
- Review in 2013 by the ombudsman at the Department of Environment and Natural Resources that said his permit denial was investigated and fully vetted through the department, asks Mr. Scott if there are other more suitable locations for his operation and advises that if Mr. Scott wants to pursue his request further he would have to seek statutory and rule changes.

Abridged Brad Scott Timeline

2007	Aquaculture Operations Permit denied	DMF Director denies Mr. Brad Scott an Aquaculture Operations Permit for nursery of shellfish in a prohibited area.
Jan. 24, 2008	MFC Declaratory Ruling	Mr. Scott sought a declaratory ruling as to the applicability of 15A NCAC 30 .0501(h), which allows the division director to evaluate potential threats to public health or marine and estuarine resources regulated by the Marine Fisheries Commission in determining whether to issue a permit, to an application for an aquaculture permit for the use of prohibit (polluted) waters for the nursery/hatchery of cultured shellfish. The commission determined the rules were properly interpreted in regards to Mr. Scott's request for a declaratory ruling and that Mr. Scott's application for an Aquaculture Operation Permit for the raising of shellfish in an aquaculture operation utilizing water from a prohibited and closed area due to pollution presents a potential threat to the public health from the risk of consuming contaminated shellfish and was properly denied by the DMF Director.
Jan. 24, 2008	MFC to revisit issue	Motion passes to revisit an issue paper on shellfish leases in polluted areas, to determine how to handle future situations of leases in polluted areas.
April 1, 2009	DMF Director offers guidelines	DMF Director sends email with guidelines on obtaining an Aquaculture Operations Permit in restricted or prohibited areas.
Feb. 12, 2010	FDA advice	FDA sends Mr. Scott an email advising that under the National Shellfish Sanitation Program, seed from waters that cause them to be contaminated with unacceptable levels of poisonous or deleterious substances is not permitted.
March - April 2011	Mr. Scott contacts Division of Environmental Health and Director's Response	3/17/11: Mr. Scott contacts Terry Pierce, Division of Environmental Health Director, concerning shellfish nursery in marinas. 4/7/11: Terry Pierce, DEH Director, responds to Mr. Scott that public health is the primary focus of state and national shellfish programs and that marinas have the potential to have elevated levels of contaminants other than bacteria and that N.C. General Statutes do not allow the type of shellfish lease he is requesting in waters closed to shellfish harvest by reason of pollution.
Sept.-Oct. 2011	Oyster meat samples analyzed by State Toxicologist	10/11/11: Division of Water Quality forwards heavy metals results from oysters collected from Masonboro Boat Yard to state toxicologist for analysis. 10/27/11: Dr. Ken Rudo, state toxicologist, finds elevated levels of arsenic and zinc and believes consumption over time would pose an increased health risk.
Nov. 4, 2011	MFC consensus statement	DMF Director updated the Marine Fisheries Commission on the status of an application to raise seed clams in prohibited waters from Mr. Scott. He said that testing in the area where the clams would be cultured had shown elevated levels of zinc and arsenic and that it was his intent not to issue an Aquaculture Operations Permit due to health concerns. The commission agreed by consensus that the nursery of shellfish in prohibited waters to be transferred to leases is an unacceptable practice.
Nov. 7, 2011	DMF Director maintains his decision to deny	Email is sent from DMF Director, maintaining his original decision denying Mr. Scott's Aquaculture Operations Permit regarding nursery of shellfish in prohibited waters.
Nov. 2011- Jan. 2012	Mr. Scott questions health risk of arsenic and response from DMF Director	1/18/12: Mr. Scott sends emails, including a forwarded email from Dr. Joshua Hamilton that questions risk based on using total arsenic vs. inorganic arsenic. 1/24/12: DMF Director email provides links that questions safety of arsenobetaine. Without conclusive evidence that there is no public health risk, he maintains his decision to deny the permit. He also reiterates that arsenic is not the only issue concerning his proposed activity.
Aug. - Oct, 2012	Shellfish/Crustacean Advisory Committee meetings	8/6/12: Mr. Scott addresses the MFC Shellfish/Crustacean Advisory Committee during public comment. Two members asked for Shellfish Sanitation staff present information concerning this issue at its next meeting. 10/2/12: Staff met with Mr. Scott in advance of the meeting to review his concerns. The division and Mr. Scott provide presentations on the permit request. While the committee took no formal action, several members advised Mr. Scott to seek another location for his facility that did not contain unacceptable levels of poisonous or deleterious substances.
2013 - 2014	DENR responses to Mr. Scott	5/2/13: Letter from DENR Ombudsman Joseph Harwood says the issue has been investigated and fully vetted within DENR, inquires if another more suitable location has been considered and advises if Mr. Scott if he wants to pursue his request further he will need to seek statutory and rule changes. 7/21/14: Email from DENR Ombudsman Joseph Harwood that says Sec. Skavarla believes that cultured and/or wild harvested seafood marketing can be adversely affected by incidences of health issues associated with shellfish from prohibited shellfish harvest waters and while N.C. rules may be more restrictive than other states, the secretary believes that the current rules are protective and prudent for our state's shellfish industry and adds an extra margin of safety for its citizens.
Dec. 2, 2014	Oyster/Clam Fishery Management Plans	Patti Fowler clarifies with Mr. Scott that information regarding shellfish hatcheries and nurseries in prohibited waters will be incorporated into the private culture sections of the plans.

NORTH CAROLINA DIVISION OF MARINE FISHERIES



Fish Dealer Report



License & Statistics Section, PO Box 769, Morehead City, NC 28557

MAY 2015

2014 ANNUAL COMMERCIAL LANDINGS REVIEW

Based on data collected through the N. C. Division of Marine Fisheries Trip Ticket Program, 61.7 million pounds of finfish and shellfish were landed in 2014 with an estimated dockside value of \$93.8 million. This reflects a 23 percent increase in landings when compared with the 2013 harvest and a 19 percent increase in value. The five year harvest levels averaged 61.6 million pounds with an average value of \$79.3 million.

2014 Percent Landings by County



The percent landings are represented by a color gradient, which increases from white to black as the percentage increases.

Dare County had the greatest percent of the 2014 landings, with 36 percent of the total landings, followed by Carteret (12 percent), Hyde (8 percent), Tyrrell (8 percent) and Camden (7 percent). The remaining counties each had landed less than 5 percent of the total.

The top five species by pounds landed were hard blue crabs with 25.2 million pounds, followed by, spiny dogfish (5.7 million pounds), shrimp (4.7 million pounds), summer flounder (2.9 million pounds) and Atlantic croaker (2.6 million pounds). Except for shrimp, landings for the top five species were up in 2014 compared with 2013.

Summer flounder landings increased dramatically, with landings in 2014 over five times higher than in 2013. This is largely due to fish being landed in N.C. instead of other states as was the case in 2013. During the 2013 season over 2.7 million pounds of the N.C. flounder quota were transferred to other states in response to the limited navigability of Oregon Inlet. The increase in landings was mirrored by an increase in the number of flounder trawl trips, the gear catching the majority of the summer flounder, which were three and a half times higher in 2014 compared with 2013.

Hard crab landings increased 18 percent from 2013, while peelers and soft blue crabs increased 39 percent and 16 percent, respectively. Values followed the increasing trend

rising by 13 percent for hard crabs, 34 percent for peelers, and 2 percent for soft crabs. The number of crab dredge trips remained low this year, however crab trawl trips more than doubled in 2014 after large decreases were observed in both 2012 and 2013.

Shrimp landings decreased by 4 percent in 2014 from the four year high seen in 2012. The landings in 2012 were driven by large increases in pink and white shrimp harvest. Despite an increase of more than million pounds in brown shrimp landings the white and pink shrimp landings continued to decline leading to an overall decrease in shrimp landings. The value of the shrimp landings increased by 9 percent this year value, but increased by 19 percent when compared to the previous four-year average. The 2014 landings decrease coincided with a 19 percent decrease in the number of shrimp trawl trips and a 40 percent decrease in the number of skimmer trawl trips compared to 2013.

For a full listing of pounds and ex-vessel value by species and further information on 2013 landings data see the *2014 Annual Fisheries Bulletin*. The bulletin also contains landings for 2010 to 2013 as well as a summary of the number of trips by major gears used in North Carolina.

ESTUARINE GILL NET PERMIT

On Sept. 1, 2014 the Estuarine Gill Net Permit became effective. It is required for any anchored small or large mesh fishing operation in internal coastal waters. The permit is a requirement of the federal incidental take permits for sea turtles and Atlantic sturgeon. A condition of the incidental take permits is to maintain certain levels of observer coverage statewide. The Estuarine Gill Net Permit requires fishermen to provide an active phone number where they can be reached to schedule observer trips so that

DMF can maintain the observer coverage needed to stay in compliance with the incidental take permits. To date, there have been 2,523 permits issued. Fishermen can obtain or renew their annual permit when they renew their license at any DMF office or via mail.

FISHERY MANAGEMENT PLAN UPDATES

State law requires the division to prepare a fishery management plan for adoption by the Marine Fisheries Commission for all commercially and recreationally significant species or fisheries in North Carolina. These plans provide management strategies designed to ensure long-term viability of each fishery. State law also requires the N. C. Division of Marine Fisheries to review each plan every five years.

Following are highlights from fishery management plans recently or currently under review:

- At its February 2015 meeting, the commission gave final approval of amendments to the Bay Scallop, River Herring and Shrimp fishery management plans. The implementing rules became effective May 1, 2015.
- An amendment to the Striped Mullet Fishery Management Plan is underway. Implementing rules are not expected to become effective until 2016.
- Amendments to the Oyster and Hard Clam fishery management plans are also underway. Implementing rules are not expected to become effective until 2017.

For more information regarding upcoming fishery management plan reviews, please see the News Releases page at (<http://portal.ncdenr.org/web/mf/news-releases>).

2015 - 2016 LICENSE YEAR FEE INCREASES

With the beginning of 2015-2016 license sales, which occurred on April 15, the price of six commercial fishing licenses increased 60 percent. The fee increases are shown in the following table, and affects all commercial fishing licenses with the exception of the Commercial Vessel Registration fee. The fee increases were proposed by the commercial fishing industry and will fund the Commercial Fishing Resource Fund. The fund will be used to cover the cost of the N.C. Division of Marine Fisheries Observer Program, a requirement of the incidental take permits for the commercial fishing industry under the federal Endangered Species Act, and for other projects to develop and support sustainable commercial fishing in the state. For more information, contact Don Hesselman at 252-808-8099 or Don.Hesselman@ncdenr.gov.

N.C. Resident Fee Changes			
License	Old Fee	New Fee	
Recreational Commercial Gear	\$43.75	\$70.00	
Standard Commercial Fishing	\$250.00	\$400.00	
Retired Standard Commercial Fishing	\$125.00	\$200.00	
Shellfish	\$31.25	\$50.00	
Application Fee for New Dealers	\$62.50	\$100.00	
Fish Dealer (Individual categories)	\$62.50	\$100.00	
Consolidated Fish Dealer	\$375.00	\$600.00	
Non-Resident Fee Changes			
License	Old Fee	New Fee	
Recreational Commercial Gear	\$312.50	\$500.00	
Land and Sell	\$250.00 minimum	\$400.00 minimum	
Standard Commercial Fishing	\$250.00 minimum	\$400.00 minimum	
Retired Standard Commercial Fishing	\$162.50	\$260.00	

NC MARINE FISHERIES COMMISSION MEETING SCHEDULE FOR 2015

May 20-22: Hilton Riverfront, New Bern

August 19-21: Hilton Brownstone, Raleigh

November 18-20: Jennette's Pier, Nags Head

***Listen to MFC Meetings live via online streaming. See division website for details.**

NORTH CAROLINA BIENNIAL FISH DEALER SURVEY

The NC Division of Marine Fisheries Trip Ticket Program conducts a survey of fish dealers every two years to obtain input on various aspects of the program. In October 2014, the survey was mailed out to the 722 licensed fish dealers in the state. The survey responses are anonymous and dealers identify themselves only if they choose. One hundred sixty-three surveys were returned, for a 22 percent response rate. The majority of respondents reported being fish dealers for less than 10 years and were located in Dare County. Following are highlights from this biennial survey.

The survey results indicate overall satisfaction with the Trip Ticket Program among dealers. Most respondents agreed or strongly agreed that the Trip Ticket program allows for easy and accurate data reporting, the program requirements are well explained, supplies are readily available and accessible, and that customer service is satisfactory. There was also a consensus among dealers that they do not support the addition of any mandatory reporting, including price data, however, they are split evenly when it comes to voluntary price reporting.

In addition to assessing dealer opinion of the current Trip Ticket Program, the survey also assessed interest and satisfaction with electronic reporting. A total of 40 electronic reporting dealers responded to the survey. Overall opinion of electronic reporting was good to excellent. A high percentage of electronic dealers, 90 percent, found the software to be easy to use and 87 percent found the instruction they received to be good to excellent.

For more information and complete results please contact Alan Bianchi at alan.bianchi@ncdenr.gov or (252)808-8092.

COMMERCIAL FISHING LICENSE HOLDER PERSONAL CONSUMPTION AND DONATION SURVEY

The N. C. Division of Marine Fisheries carried out a mail-based pilot survey of commercial fishing license holders in early 2015 as part of an effort to gather information on fish and shellfish that are landed with commercial fishing gear but kept for personal consumption or donation. Being a pilot survey to gauge if more effort is needed to examine the extent of unsold catch, the survey was designed to be brief. Respondents were asked to answer a series of five general questions regarding their main reason for owning a commercial fishing license, whether they fished with commercial gears or harvested commercial quantities of shellfish or finfish in 2014, what kind of gears were used, typical use of catch, and estimated harvest of seafood caught by commercial gears but kept for personal consumption or donation.

Out of the 2,000 commercial fishing license holders that were mailed the survey, the division received 657 responses, making for an overall response rate of approximately 33 percent. These license holders held 477 standard commercial fishing licenses, 164 retired standard commercial fishing licenses, and 75 commercial

shellfish licenses. A final report detailing the results of this survey will be available by mid-May. A full copy of the report will be made accessible on the division's website at <http://portal.ncdenr.org/web/mf/social-economic-data-reports> or by contacting John Hadley at john.hadley@ncdenr.gov or 252-808-8107.

LICENSE SALES JULY 1, 2013 to APRIL 27, 2014

Below are sales as of April 27 by license type for the 2015 (July 1,2014-June 30,2015) license year. The values below include active licenses only. Totals do not include transfers, replacements or voids.

Standard Commercial Fishing License	4,886
Retired Standard Commercial Fishing License	1,171
Commercial Fishing Vessel Registration	7,947
Land or Sell License	112
NC Resident Shellfish License Without SCFL	1,285
Fish Dealer License	722
Ocean Pier License	20
Recreational Fishing Tournament License	15
Recreational Commercial Gear License	2,793
Total Licenses For All License Types	19,708

Licenses for license year 2016 (July 1, 2015 – June 30, 2016) went on sale April 15 and renewal by mail is available. If you want to avoid the lines at the license office, please use the mail-in process.

Annual Fisheries Bulletin

2014 Commercial & Recreational Statistics



License and Statistics Section
 PO Box 769
 Morehead City, NC 28557
 May 2015



The Annual Fisheries Bulletin contains the North Carolina commercial and recreational fisheries harvest statistics for 2014. Included in this bulletin are the 2014 landings from the commercial and recreational fisheries programs, along with the 2010 to 2013 landings for comparison purposes. The bulletin also contains a summary of commercial fishing trips by major gears.

The North Carolina Trip Ticket Program collects commercial fishery landings and effort statistics. This program mandates trip level fish dealer reporting of all finfish and shellfish landed in the state. Recreational fishery harvest and effort statistics are derived from the Marine Recreational Information Program (MRIP) that conducts recreational angler interviews at public access points and telephone surveys.

Total Pounds Harvested in 2014

Commercial
61,742,966 pounds

Recreational
8,999,639 pounds

Top Five Species Caught In Each Fishery

Commercial	
Species	Pounds
Hard Blue Crabs	25,243,005
Spiny Dogfish	5,650,285
Shrimp (Heads On)	4,683,652
Summer Flounder	2,906,789
Atlantic Croaker	2,629,793

Recreational	
Species	Pounds
Dolphin	1,338,209
Bluefish	961,222
Yellowfin tuna	913,785
Spot	704,445
Red drum	598,166

Issued by the North Carolina Division of Marine Fisheries, Department of Environment and Natural Resources.

For additional information regarding Commercial and Recreational Statistics, please contact:

Alan Bianchi, Commercial Statistics
 (252) 726-7021 or (800) 682-2632
alan.bianchi@ncdenr.gov

Doug Mumford, Recreational Statistics
 (252) 948-3876 or (800) 338-7804
doug.mumford@ncdenr.gov

2014 North Carolina Commercial Landings 2014

Issued: May 2015

FINFISH	POUNDS (Whole/Round Weight)	VALUE
Amberjacks ¹	193,001	\$198,899
Anglerfish (Monkfish including Monkclivers)	75,962	\$84,931
Bluefish	2,019,154	\$889,681
Bonito	9,081	\$14,386
Butterfish	53,607	\$27,287
Carp	16,435	\$1,555
Catfishes	521,241	\$158,430
Cobia	41,798	\$87,931
Croaker, Atlantic	2,629,793	\$1,865,543
Cutlassfish, Atlantic	165,375	\$221,870
Dolphinfish	423,676	\$1,242,648
Drum, Black	51,023	\$32,178
Drum, Red	90,594	\$208,166
Eel, American	58,886	\$159,727
Flounder, Southern	1,673,261	\$4,838,892
Flounder, Summer	2,906,789	\$8,211,281
Flounders, Other	4,413	\$8,926
Garfish	10,621	\$3,611
Grouper, Gag	167,572	\$737,755
Grouper, Red	53,096	\$202,112
Grouper, Scamp	42,207	\$187,776
Grouper, Snowy	27,553	\$102,830
Groupers, Other	9,125	\$33,799
Grunts	39,043	\$39,843
Hakes	652	\$293
Harvestfish (Starbutters)	155,334	\$187,874
Herring, River (Alewife and Blueback Herring)	989	\$1,319
Hogfish (Hog Snapper)	9,767	\$37,920
Jacks	9,151	\$6,220
Mackerel, Atlantic (Boston)	1,761	\$658
Mackerel, King	549,727	\$1,202,899
Mackerel, Spanish	673,897	\$1,230,312
Menhaden, Atlantic	917,375	\$145,587
Mullet, Sea (Kingfishes)	952,263	\$1,004,523
Mullet, Striped	1,825,091	\$1,110,664
Perch, White	172,236	\$148,530
Perch, Yellow	67,452	\$82,334
Pigfish	38,570	\$15,333
Pinfish	1,431	\$561
Pompano	12,921	\$31,171
Porgies	82,685	\$144,985
Pufferfish	1,611	\$886
Scup	160,508	\$110,203
Sea Basses	523,234	\$1,400,012
Seatrout, Spotted	241,995	\$578,934
Shad, American	193,130	\$160,977
Shad, Gizzard	113,841	\$5,692
Shad, Hickory	109,407	\$27,394

2014 North Carolina Commercial Landings

(continued)

FINFISH	POUNDS (Whole/Round Weight)	VALUE
Sharks ²	1,005,858	\$473,375
Sharks, Dogfish, Smooth	498,904	\$213,763
Sharks, Dogfish, Spiny	5,650,285	\$566,615
Sheepshead	173,367	\$159,266
Skates	18,907	\$6,137
Skippers	19,884	\$5,207
Snapper, Red ³	4,826	\$23,007
Snapper, Vermilion (Beeliner)	242,259	\$829,916
Snappers, Other	4,002	\$11,695
Spadefish, Atlantic	22,761	\$10,652
Spot	764,689	\$618,398
Striped Bass	96,233	\$283,241
Swordfish	694,911	\$2,109,549
Tilefish	91,074	\$238,808
Triggerfish	116,782	\$262,199
Tuna, Bigeye	337,269	\$1,222,610
Tuna, Bluefin	114,037	\$375,975
Tuna, Yellowfin	816,077	\$1,798,031
Tunas, Other	155,033	\$115,186
Tunny, Little (False Albacore)	225,797	\$107,605
Wahoo	22,715	\$71,612
Weakfish (Gray Trout)	105,115	\$140,430
Unclassified Fish for Food	122,116	\$132,944
Unclassified Fish for Industrial Use or Bait	24,611	\$4,192
TOTAL FINFISH	29,425,842	\$36,975,752
SHELLFISH		
Shrimp (Heads On) ⁴	4,683,652	\$14,131,151
Clams, Hard (Meats)	430,777	\$2,865,960
	(22,438,758 numbers)	--
Blue Crabs, Hard	25,243,005	\$29,954,893
Blue Crabs, Peeler	621,040	\$1,935,462
Blue Crabs, Soft	367,277	\$2,137,335
Octopus	213	\$271
Oysters (Meats)	727,043	\$4,539,334
	(139,548 bushels)	
Scallop, Bay (Meats)	0	\$0
Scallop, Sea (Meats)	92,976	\$1,011,221
Squid	16,072	\$13,421
Stone Crabs	7,451	\$19,882
Unclassified Shellfish	74,073	\$146,470
Whelks/Conchs (Meats)	53,546	\$112,102
TOTAL SHELLFISH	32,317,124	\$56,867,502
GRAND TOTAL	61,742,966	\$93,843,254

¹ Includes species from the genus *Seriola* (amberjacks, almaco jacks, and banded rudderfish.)

² Includes shark fins and the following sharks: blacknose, blacktip, bonnethead, bull, finetooth, hammerhead, shortfin mako, spinner, thresher, tiger, and Atlantic sharpnose.

³ The red snapper fishery closed on January 4, 2010 with restricted openings occurring in some years.

⁴ Includes brown, pink, and white shrimp.

* Units and value not shown to avoid disclosure of private enterprise.

Updated: May 2015

FINFISH	POUNDS (Whole/Round Weight)	VALUE
Amberjacks ¹	90,180	\$90,035
Anglerfish (Monkfish including Monklivers)	10,566	\$9,053
Bluefish	1,159,580	\$564,377
Bonito	10,506	\$15,460
Butterfish	93,146	\$53,369
Carp	14,133	\$1,360
Catfishes	548,913	\$92,497
Cobia	35,456	\$73,142
Croaker, Atlantic	1,927,938	\$1,723,578
Cutlassfish, Atlantic	145,362	\$204,869
Dolphinfish	178,922	\$534,228
Drum, Black	127,170	\$79,480
Drum, Red	371,949	\$715,685
Eel, American	33,980	\$88,649
Flounder, Southern	2,186,273	\$5,672,904
Flounder, Summer	541,661	\$1,386,627
Flounders, Other	*	*
Garfish	5,893	\$1,208
Grouper, Gag	167,334	\$704,382
Grouper, Red	72,259	\$259,861
Grouper, Scamp	42,711	\$180,679
Grouper, Snowy	20,274	\$72,067
Groupers, Other	8,856	\$31,637
Grunts	44,702	\$47,062
Hakes	614	\$231
Harvestfish (Starbutters)	221,168	\$253,604
Herring, River (Alewife and Blueback Herring)	743	\$743
Hogfish (Hog Snapper)	7,847	\$30,640
Jacks	14,492	\$10,639
Mackerel, Atlantic (Boston)	154	\$61
Mackerel, King	345,177	\$877,497
Mackerel, Spanish	620,752	\$1,015,965
Menhaden, Atlantic	454,172	\$73,490
Mullet, Sea (Kingfishes)	603,186	\$668,480
Mullet, Striped	1,549,157	\$1,402,914
Perch, White	275,652	\$255,633
Perch, Yellow	31,481	\$40,546
Pigfish	62,099	\$28,093
Pinfish	1,536	\$463
Pompano	15,423	\$41,351
Porgies	72,671	\$116,780
Pufferfish	5,846	\$2,858
Scup	28,691	\$13,323
Sea Basses	329,731	\$868,920
Seatrout, Spotted	367,610	\$818,078
Shad, American	257,869	\$307,475
Shad, Gizzard	112,295	\$4,492
Shad, Hickory	71,326	\$29,144

2013 North Carolina Commercial Landings

(continued)

FINFISH	POUNDS (Whole/Round Weight)	VALUE
Sharks ²	553,665	\$282,318
Sharks, Dogfish, Smooth	783,053	\$344,182
Sharks, Dogfish, Spiny	3,010,958	\$302,248
Sheepshead	180,225	\$145,794
Skates	2,286	\$429
Skippers	15,780	\$4,652
Snapper, Red ³	2,686	\$11,942
Snapper, Vermilion (Beeliner)	267,260	\$886,596
Snappers, Other	6,587	\$19,449
Spadefish, Atlantic	20,369	\$9,246
Spot	768,592	\$690,035
Striped Bass	96,935	\$303,486
Swordfish	1,058,089	\$2,935,940
Tilefish	217,079	\$522,652
Triggerfish	160,861	\$342,228
Tuna, Bigeye	243,637	\$939,909
Tuna, Bluefin	106,197	\$608,952
Tuna, Yellowfin	648,039	\$1,434,318
Tunas, Other	96,937	\$113,429
Tunny, Little (False Albacore)	189,746	\$114,416
Wahoo	23,380	\$75,577
Weakfish (Gray Trout)	120,188	\$150,725
Unclassified Fish for Food	118,974	\$116,156
Unclassified Fish for Industrial Use or Bait	24,389	\$2,565
TOTAL FINFISH	22,003,366	\$29,820,875
SHELLFISH		
Shrimp (Heads On) ⁴	4,859,833	\$12,947,004
Clams, Hard (Meats)	347,048	\$2,295,096
	(17,855,759 numbers)	-
Blue Crabs, Hard	21,438,400	\$26,465,890
Blue Crabs, Peeler	447,120	\$1,449,542
Blue Crabs, Soft	317,426	\$2,091,382
Octopus	1,205	\$2,069
Oysters (Meats)	586,619	\$3,353,095
	(112,595 bushels)	-
Scallop, Bay (Meats)	1,337	\$9,506
Scallop, Sea (Meats)	36,445	\$402,717
Squid	12,090	\$10,703
Stone Crabs	6,839	\$18,479
Unclassified Shellfish	89,930	\$115,183
Whelks/Conchs (Meats)	50,079	\$123,236
TOTAL SHELLFISH	28,194,369	\$49,283,901
GRAND TOTAL	50,197,736	\$79,104,776

¹ Includes species from the genus *Seriola* (amberjacks, almaco jacks, and banded rudderfish.)

² Includes shark fins and the following sharks: blacktip, bonnethead, bull, finetooth, hammerhead, shortfin mako, spinner, thresher, tiger, and Atlantic sharpnose.

³ The red snapper fishery closed on January 4, 2010 with restricted openings occurring in some years.

⁴ Includes brown, pink, and white shrimp.

* Units and value not shown to avoid disclosure of private enterprise.

Updated: May 1, 2015

FINFISH	POUNDS (Whole/Round Weight)	VALUE
Amberjacks ¹	124,325	\$104,212
Anglerfish (Monkfish including Monkfish)	21,649	\$25,286
Bluefish	758,858	\$349,288
Bonito	11,343	\$15,833
Butterfish	127,536	\$65,553
Carp	6,199	\$586
Catfishes	489,492	\$116,379
Cobia	31,972	\$61,603
Croaker, Atlantic	3,106,616	\$2,135,458
Cutlassfish, Atlantic	50,867	\$61,601
Dolphinfish	249,020	\$756,346
Drum, Black	94,352	\$54,133
Drum, Red	66,519	\$138,833
Eel, American	64,110	\$160,275
Flounder, Southern	1,646,137	\$4,451,482
Flounder, Summer	1,090,218	\$2,969,370
Flounders, Other	0	\$0
Garfish	18,490	\$2,339
Grouper, Gag	187,483	\$758,371
Grouper, Red	111,781	\$363,767
Grouper, Scamp	49,556	\$195,370
Grouper, Snowy	25,740	\$78,235
Groupers, Other	7,542	\$26,152
Grunts	49,734	\$50,044
Hakes	280	\$100
Harvestfish (Starbutters)	161,751	\$202,146
Herring, River (Alewife and Blueback Herring)	678	\$678
Hogfish (Hog Snapper)	8,256	\$28,738
Jacks	16,200	\$13,414
Mackerel, Atlantic (Boston)	1,374	\$567
Mackerel, King	297,423	\$831,297
Mackerel, Spanish	916,439	\$1,374,648
Menhaden, Atlantic	538,783	\$82,974
Mullet, Sea (Kingfishes)	596,249	\$645,607
Mullet, Striped	1,859,587	\$1,041,659
Perch, White	189,448	\$150,940
Perch, Yellow	20,511	\$23,446
Pigfish	37,555	\$19,834
Pinfish	1,017	\$257
Pompano	22,525	\$43,376
Porgies	83,918	\$132,025
Pufferfish	5,531	\$2,799
Scup	3,954	\$2,768
Sea Basses	256,007	\$687,905
Seatrout, Spotted	265,016	\$522,130
Shad, American	235,861	\$257,748
Shad, Gizzard	123,813	\$4,333
Shad, Hickory	65,645	\$22,389

2012 North Carolina Commercial Landings

(continued)

FINFISH	POUNDS (Whole/Round Weight)	VALUE
Sharks ²	701,924	\$376,171
Sharks, Dogfish, Smooth	980,275	\$379,946
Sharks, Dogfish, Spiny	2,728,882	\$640,820
Sheepshead	109,881	\$92,837
Skates	5,738	\$1,433
Skippers	21,998	\$5,804
Snapper, Red ³	445	\$1,898
Snapper, Vermilion (Beeliner)	276,172	\$889,691
Snappers, Other	2,751	\$8,036
Spadefish, Atlantic	24,238	\$9,043
Spot	489,676	\$465,750
Striped Bass	144,555	\$368,516
Swordfish	903,178	\$3,009,107
Tilefish	361,094	\$753,966
Triggerfish	143,114	\$278,968
Tuna, Bigeye	232,943	\$1,036,747
Tuna, Bluefin	130,496	\$1,017,958
Tuna, Yellowfin	855,006	\$2,130,454
Tunas, Other	105,893	\$123,039
Tunny, Little (False Albacore)	157,849	\$89,798
Wahoo	23,521	\$73,998
Weakfish (Gray Trout)	91,383	\$111,461
Unclassified Fish for Food	111,190	\$111,452
Unclassified Fish for Industrial Use or Bait	34,775	\$7,615
TOTAL FINFISH	22,734,334	\$31,016,802
SHELLFISH		
Shrimp (Heads On) ⁴	6,141,480	\$13,333,150
Clams, Hard (Meats)	396,429	\$2,091,067
	(20,074,457 clams)	--
Blue Crabs, Hard	25,991,387	\$20,198,891
Blue Crabs, Peeler	469,761	\$1,114,177
Blue Crabs, Soft	325,426	\$1,496,021
Octopus	248	\$382
Oysters (Meats)	440,063	\$2,572,073
	(84,465 bushels)	--
Scallop, Bay (Meats)	0	\$0
Scallop, Sea (Meats)	58,882	\$567,230
Squid	11,921	\$10,885
Stone Crabs	5,221	\$17,125
Unclassified Shellfish	77,602	\$79,721
Whelks/Conchs (Meats)	39,078	\$75,705
TOTAL SHELLFISH	33,957,498	\$41,556,427
GRAND TOTAL	56,691,832	\$72,573,230

¹ Includes species from the genus *Seriola* (amberjacks, almaco jacks, and banded rudderfish.)

² Includes shark fins and the following sharks: blacktip, bonnethead, bull, finetooth, hammerhead, shortfin mako, spinner, thresher, tiger, and Atlantic sharpnose.

³ The red snapper fishery closed on January 4, 2010 with restricted openings occurring in some years.

⁴ Includes brown, pink, and white shrimp.

* Units and value not shown to avoid disclosure of private enterprise.

Updated: May 1, 2015

FINFISH	POUNDS (Whole/Round Weight)	VALUE
Amberjacks ¹	72,797	\$62,815
Anglerfish (Monkfish including Monklivers)	38,892	\$48,702
Bluefish	1,897,408	\$848,327
Bonito	11,039	\$20,041
Butterfish	59,951	\$31,176
Carp	24,367	\$2,485
Catfishes	444,445	\$85,039
Cobia	19,924	\$34,908
Croaker, Atlantic	5,054,186	\$3,164,034
Cutlassfish, Atlantic	8,439	\$9,397
Dolphinfish	94,210	\$244,752
Drum, Black	56,083	\$26,432
Drum, Red	91,980	\$166,966
Eel, American	61,960	\$123,920
Flounder, Southern	1,247,450	\$2,753,128
Flounder, Summer	2,854,122	\$6,136,614
Flounders, Other	*	*
Garfish	25,933	\$2,334
Grouper, Gag	201,467	\$790,710
Grouper, Red	154,277	\$481,431
Grouper, Scamp	37,321	\$143,336
Grouper, Snowy	8,999	\$24,680
Groupers, Other	6,454	\$22,869
Grunts	33,443	\$34,344
Hakes	873	\$591
Harvestfish (Starbutters)	106,660	\$102,927
Herring, River (Alewife and Blueback Herring)	1,611	\$1,611
Hogfish (Hog Snapper)	10,793	\$37,688
Jacks	1,068	\$706
Mackerel, Atlantic (Boston)	6,512	\$3,286
Mackerel, King	408,162	\$1,062,081
Mackerel, Spanish	871,217	\$1,188,154
Menhaden, Atlantic	3,529,967	\$336,528
Mullet, Sea (Kingfishes)	486,853	\$520,413
Mullet, Striped	1,627,894	\$1,015,852
Perch, White	245,636	\$223,248
Perch, Yellow	27,838	\$38,554
Pigfish	39,838	\$12,838
Pinfish	905	\$252
Pompano	17,016	\$42,724
Porgies	90,792	\$133,648
Pufferfish	1,490	\$916
Scup	308,907	\$126,875
Sea Basses	272,280	\$627,825
Seatrout, Spotted	75,239	\$144,596
Shad, American	204,085	\$182,894
Shad, Gizzard	101,025	\$5,051
Shad, Hickory	85,096	\$23,607

2011 North Carolina Commercial Landings

(continued)

FINFISH	POUNDS (Whole/Round Weight)	VALUE
Sharks ²	584,238	\$327,802
Sharks, Dogfish, Smooth	1,241,252	\$401,178
Sharks, Dogfish, Spiny	2,557,923	\$383,748
Sheepshead	120,976	\$90,068
Skates	19,204	\$7,730
Skippers	24,510	\$6,594
Snapper, Red	0	\$0
Snapper, Vermilion (Beeliner)	323,389	\$997,623
Snappers, Other	2,982	\$7,077
Spadefish, Atlantic	21,535	\$6,839
Spot	936,970	\$728,475
Striped Bass	410,685	\$1,164,426
Swordfish	803,725	\$2,617,201
Tilefish	133,824	\$314,600
Triggerfish	220,204	\$411,373
Tuna, Bigeye	277,659	\$1,094,276
Tuna, Bluefin	48,358	\$270,637
Tuna, Yellowfin	526,238	\$944,099
Tunas, Other	76,661	\$68,578
Tunny, Little (False Albacore)	131,549	\$66,986
Wahoo	15,870	\$44,685
Weakfish (Gray Trout)	65,897	\$78,522
Unclassified Fish for Food	113,326	\$145,153
Unclassified Fish for Industrial Use or Bait	54,904	\$9,304
TOTAL FINFISH	29,738,779	\$31,278,276
SHELLFISH		
Shrimp (Heads On) ³	5,140,360	\$10,885,795
Clams, Hard (Meats)	295,466	\$1,896,627
	(15,088,757 clams)	--
Blue Crabs, Hard	28,964,633	\$18,016,736
Blue Crabs, Peeler	624,362	\$1,186,286
Blue Crabs, Soft	446,397	\$2,079,242
Octopus	327	\$501
Oysters (Meats)	800,543	\$4,486,741
	(153,655 bushels)	--
Scallop, Bay (Meats)	0	\$0
Scallop, Sea (Meats)	91,077	\$883,772
Squid	1,267,192	\$291,060
Stone Crabs	7,630	\$21,926
Unclassified Shellfish	90,932	\$83,407
Whelks/Conchs (Meats)	34,002	\$73,456
TOTAL SHELLFISH	37,762,921	\$39,905,550
GRAND TOTAL	67,501,700	\$71,183,826

¹ Includes species from the genus *Seriola* (amberjacks, almaco jacks, and banded rudderfish.)

² Includes shark fins and the following sharks: blacktip, hammerhead, lemon, shortfin mako, thresher, and Atlantic sharpnose.

³ The red snapper fishery closed on January 4, 2010 with restricted openings occurring in some years.

⁴ Includes brown, pink, white and rock shrimp.

* Units and value not shown to avoid disclosure of private enterprise.

Updated: May 1, 2015

FINFISH	POUNDS (Whole/Round Weight)	VALUE
Amberjacks ¹	128,762	\$95,599
Anglerfish (Monkfish including Monklivers)	47,305	\$60,322
Bluefish	3,216,019	\$1,129,688
Bonito	15,686	\$20,152
Butterfish	55,087	\$32,656
Carp	23,807	\$2,200
Catfishes	354,892	\$64,316
Cobia	43,715	\$64,829
Croaker, Atlantic	7,312,159	\$3,409,671
Cutlassfish, Atlantic	19,753	\$14,353
Dolphinfish	239,551	\$492,270
Drum, Black	69,194	\$32,805
Drum, Red	231,828	\$421,781
Eel, American	122,104	\$351,048
Flounder, Southern	1,689,557	\$3,695,889
Flounder, Summer	3,310,992	\$7,212,191
Flounders, Other	358	\$363
Garfish	12,182	\$812
Grouper, Gag	222,749	\$766,577
Grouper, Red	231,780	\$625,224
Grouper, Scamp	60,163	\$200,970
Grouper, Snowy	35,472	\$106,298
Groupers, Other	11,761	\$31,473
Grunts	47,219	\$42,279
Hakes	5,001	\$1,429
Harvestfish (Starbutters)	80,459	\$106,592
Herring, River (Alewife and Blueback Herring)	1,765	\$1,765
Hogfish (Hog Snapper)	13,046	\$37,897
Jacks	2,288	\$1,586
Mackerel, Atlantic (Boston)	45,276	\$17,595
Mackerel, King	328,806	\$643,861
Mackerel, Spanish	911,866	\$1,026,562
Menhaden, Atlantic	1,299,130	\$111,552
Mullet, Sea (Kingfishes)	886,841	\$958,377
Mullet, Striped	2,082,832	\$1,002,468
Perch, White	200,501	\$162,388
Perch, Yellow	57,027	\$68,576
Pigfish	32,867	\$16,433
Pinfish	14,579	\$3,635
Pompano	14,840	\$39,124
Porgies	84,781	\$107,864
Pufferfish	2,472	\$1,629
Scup	102,853	\$51,424
Sea Basses	401,489	\$947,900
Seatrout, Spotted	200,822	\$350,925
Shad, American	234,520	\$191,453
Shad, Gizzard	87,340	\$43,670
Shad, Hickory	108,032	\$20,951

2010 North Carolina Commercial Landings

(continued)

FINFISH	POUNDS (Whole/Round Weight)	VALUE
Sharks ²	629,421	\$325,080
Sharks, Dogfish, Smooth	1,614,844	\$503,749
Sharks, Dogfish, Spiny	1,708,437	\$256,512
Sheepshead	157,631	\$99,666
Skates	7,503	\$1,454
Skippers	13,937	\$3,991
Snapper, Red	*	*
Snapper, Vermilion (Beeliner)	316,782	\$946,157
Snappers, Other	3,435	\$9,346
Spadefish, Atlantic	18,827	\$6,116
Spot	572,315	\$384,386
Striped Bass	500,152	\$1,221,524
Swordfish	629,933	\$1,897,151
Tilefish	430,394	\$817,388
Triggerfish	225,682	\$349,179
Tuna, Bigeye	96,464	\$338,881
Tuna, Bluefin	48,562	\$416,044
Tuna, Yellowfin	368,027	\$616,442
Tunas, Other	43,626	\$41,778
Tunny, Little (False Albacore)	147,337	\$76,491
Wahoo	12,626	\$30,329
Weakfish (Gray Trout)	106,328	\$105,293
Unclassified Fish for Food	76,320	\$118,846
Unclassified Fish for Industrial Use or Bait	67,663	\$14,190
TOTAL FINFISH	32,497,778	\$33,369,413
SHELLFISH		
Shrimp (Heads On) ³	5,955,335	\$10,691,399
Clams, Hard (Meats)	354,961	\$2,581,033
	(18,233,183 clams)	--
Blue Crabs, Hard	29,794,329	\$23,801,594
Blue Crabs, Peeler	568,210	\$1,197,855
Blue Crabs, Soft	320,472	\$1,544,342
Octopus	941	\$1,111
Oysters (Meats)	1,040,407	\$5,045,127
	(199,694 bushels)	--
Scallop, Bay (Meats)	*	*
Scallop, Sea (Meats)	171,898	\$1,222,893
Squid	1,228,715	\$284,426
Stone Crabs	5,593	\$19,104
Unclassified Shellfish	47,308	\$74,953
Whelks/Conchs (Meats)	15,672	\$30,623
TOTAL SHELLFISH	39,503,840	\$46,494,460
GRAND TOTAL	72,001,618	\$79,863,873

¹ Includes species from the genus *Seriola* (amberjacks, almaco jacks, and banded rudderfish.)

² Includes shark fins and the following sharks: blacktip, bull, hammerhead, shortfin mako, sandbar, thresher, tiger, and Atlantic sharpnose.

³ Includes brown, pink, and white shrimp.

North Carolina Commercial Fishing Trips By Major Gears

(2010 - 2014)

Gear	Trips				
	2010	2011	2012	2013	2014 ¹
Beach Seine	183	102	68	57	21
By Hand	18,275	15,931	15,188	16,446	17,975
Cast Net	905	612	804	703	627
Channel Net	1,069	538	1,508	1,626	1,059
Clam Dredges	603	400	492	344	388
Clam Trawl Kicking	518	286	188	180	155
Crab Dredge	147	69	5	1	5
Crab Pot	50,428	48,144	48,052	48,121	50,522
Crab Trawl	274	228	20	85	180
Eel Pot	121	93	177	70	140
Fish Pot	649	538	613	623	672
Flounder Trawl	384	344	108	71	256
Flynet	286	190	14	4	40
Fyke Net	277	266	329	424	404
Gigs	2,424	2,183	3,148	2,585	2,801
Gill Net – Anchored	33,219	30,079	31,277	36,985	27,912
Gill Net – Drift	269	182	392	236	296
Gill Net – Runaround	3,677	2,606	3,590	3,785	3,379
Haul Seines ²	372	369	177	273	204
Longlines	568	529	578	719	634
Oyster Dredge	10,658	7,400	2,264	3,763	5,705
Peeler Pot	3,347	2,908	3,516	3,334	4,006
Peeler Trawl ³	31	41	24	29	26
Pound Nets	2,298	2,260	2,679	2,589	2,346
Rakes	10,389	9,437	9,403	9,988	11,778
Rod-n-Reel	2,486	1,986	2,151	2,066	2,263
Shrimp Trawl	5,592	4,372	6,195	5,650	4,577
Skimmer Trawl	1,096	330	1,088	1,194	712
Spears (Diving)	84	57	134	159	195
Tongs	4,797	6,020	5,527	4,092	3,895
Trolling	2,193	1,866	1,888	2,184	2,245
Trotline	6	20	50	38	49
Other Gears ⁴	130	89	92	204	166
Total trips⁵	157,755	140,475	141,739	148,628	145,633

A **trip** is defined as the time period beginning when a vessel or fisherman leaves port to conduct fishing activities and ends when that vessel or fisherman returns to land the catch. The duration of a trip can vary from a few hours, as in hand clamming, to several days, as in ocean flounder trawling. An assessment of the number of trips gives an indication of the amount of effort conducted by commercial fishermen within that fishery.

¹ Trips are preliminary.

² Includes long hauls, common seines, and swipe nets.

³ A new code to distinguish peeler trawl gear was put into effect in 2010.

⁴ Includes greenstick trolling, butterfly nets, conch pots, dip nets, purse seines, bay scallop dredges, scallop scoops and trawls, shrimp pots and turtle pots; includes 701 scallop scoop trips in 2009.

⁵ Total trips are not equal to the sum of trips by gear due to multi-gear trips.

Source: North Carolina Division of Marine Fisheries Trip Ticket Program (April 2015).

North Carolina Marine Recreational Finfish Harvest 2013 and 2014

<u>SPECIES</u>	<u>NUMBER 2013</u>	<u>NUMBER 2014</u>	<u>POUNDS 2013</u>	<u>POUNDS 2014</u>
Amberjacks	10,078	3,371	172,647	65,723
Barracudas	224	891	1,276	11,043
Bluefish	1,183,627	1,080,853	988,664	961,222
Bonito	9,219	6,533	133,163	30,628
Cobia	19,224	9,714	506,067	244,831
Croaker, Atlantic	411,882	541,474	141,880	227,826
Dolphin	212,388	189,413	1,562,755	1,338,209
Drum, Red	164,218	116,921	676,050	598,166
Drum, Black	363,466	24,118	713,047	60,552
Flounder, Southern	178,178	69,828	409,086	149,244
Flounder, Summer	44,941	45,699	70,874	67,783
Groupers	5,390	1,852	54,418	20,363
Grunts	16,374	27,552	26,769	41,392
Jacks	25,164	9,013	24,835	29,193
Kingfishes	1,377,835	1,141,810	343,454	451,226
Mackerel, King	22,613	25,892	235,436	403,508
Mackerel, Spanish	497,329	389,167	625,035	441,511
Perch, Silver	13,345	11,519	2,366	2,519
Pigfish	299,065	293,196	101,014	83,634
Pinfish	355,871	332,156	61,148	74,072
Pompano	471,156	166,887	171,860	83,190
Porgies	8,460	8,673	16,720	17,453
Puffers	209,770	49,269	126,039	25,416
Sea Bass, Black	49,258	76,417	68,225	134,662
Seatrout, Spotted	369,265	234,658	649,158	435,176
Sharks	13,426	3,390	20,386	23,772
Sharks, Dogfish	4,986	1,044	10,143	4,947
Sheepshead	273,211	61,379	500,096	143,782
Snappers	9,852	9,641	14,013	15,739
Spot	1,464,592	2,111,899	460,928	704,445
Striped Bass ¹	0	0	0	0
Tuna, Bluefin ²	201	69	40,979	69
Tuna, Yellowfin	44,688	28,954	1,441,122	913,785
Wahoo	9,370	13,354	255,306	368,394
Weakfish	33,851	26,288	34,731	25,961

¹ Striped Bass landings reflect Atlantic Ocean catches only.

² Landings for Atlantic Bluefin Tuna (ABT) reflect the Highly Migratory Species fishing year (January 1 through December 31).

NOTE: The number and pounds of finfish listed represent estimated harvest; finfish released alive are not included. Headboat landings are not included but are available upon request from NOAA Beaufort Lab's Southeast Region Headboat Survey.

North Carolina Marine Recreational Finfish Harvest 2010, 2011 and 2012

<u>SPECIES</u>	NUMBER	NUMBER	NUMBER	POUNDS	POUNDS	POUNDS
	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>
Amberjacks	16,536	5,752	8,976	369,224	112,991	154,734
Barracudas	1,410	916	683	11,011	10,882	8,535
Bluefish	1,104,077	1,152,105	888,888	953,113	999,240	1,010,575
Bonito	551	11,144	4,281	9,967	147,403	38,551
Cobia	15,125	4,478	2,050	498,581	145,796	104,106
Croaker, Atlantic	478,156	246,676	288,813	241,993	99,298	105,530
Dolphin	498,626	472,174	327,116	3,291,521	3,538,922	2,559,382
Drum, Red	64,024	45,143	52,948	283,286	212,245	238,312
Drum, Black	122,709	211,396	139,363	305,517	151,407	243,965
Flounder, Southern	250,790	152,557	118,614	539,941	380,158	298,043
Flounder, Summer	77,157	60,422	63,135	111,539	100,543	101,642
Groupers	21,067	9,676	10,198	275,085	107,853	126,567
Grunts	44,877	27,490	62,734	56,802	44,214	95,724
Jacks	14,103	15,548	19,239	71,622	25,712	20,463
Kingfishes	953,327	587,151	1,050,826	389,905	246,886	383,427
Mackerel, King	36,541	14,220	27,353	336,327	180,014	333,614
Mackerel, Spanish	483,956	367,086	491,238	565,830	470,541	665,201
Perch, Silver	6,460	33,909	22,053	1,736	6,261	3,988
Pigfish	175,430	225,472	334,052	57,759	73,538	117,021
Pinfish	218,975	143,300	259,674	35,308	27,601	40,471
Pompano	100,541	122,819	107,260	46,660	47,406	57,882
Porgies	21,391	6,683	15,857	40,812	11,117	26,249
Puffers	149,704	156,916	268,515	72,952	91,384	134,113
Sea Bass, Black	138,961	95,004	75,638	186,803	143,234	127,621
Seatrout, Spotted	195,065	215,922	500,522	407,534	403,517	817,551
Sharks	7,145	5,831	2,350	50,787	21,241	44,170
Sharks, Dogfish	2,610	4,334	316	8,434	12,086	1,454
Sheepshead	145,873	66,689	119,899	420,108	180,145	293,570
Snappers	23,713	13,376	27,822	35,041	25,167	60,163
Spot	834,560	1,207,335	784,272	260,341	410,317	230,250
Striped bass ¹	23,778	94,182	0	435,756	2,042,981	0
Tuna, Bluefin ²	579	329	189	88,463	53,941	31,861
Tuna, Yellowfin	23,251	25,039	57,100	828,571	811,673	1,579,260
Wahoo	12,610	14,798	30,885	365,697	396,775	854,568
Weakfish	41,598	13,464	40,299	38,721	17,621	46,081

¹ Striped bass landings reflect Atlantic Ocean catches only.

² Landings for Atlantic Bluefin Tuna represent Highly Migratory Species fishing year January 1 through December 31.

NOTE: The number and pounds of finfish listed represent estimated harvest; finfish released alive are not included. Headboat landings are not included but are available upon request from NOAA Beaufort Lab's Southeast Region Headboat Survey.

North Carolina Coastal Angling Program

North Carolina Marine Recreational Finfish Harvest and Release Catch Estimates

Year	<u>Number Harvested</u>	<u>Pounds Harvested</u>	<u>Number Released</u>
2010	10,062,809	13,636,398	20,006,836
2011	8,564,946	13,240,808	15,865,229
2012	8,472,954	12,059,556	18,536,492
2013	11,479,525	11,968,710	20,963,650
2014	9,583,082	8,999,639	19,778,828

North Carolina Marine Recreational Fishing Trip Estimates (number)

Year	<u>Beach/Bank</u>	<u>Charter Boat</u>	<u>Manmade</u>	<u>Private Boat</u>	<u>Total</u>
2010	1,930,919	165,304	1,382,296	2,199,055	5,677,574
2011	1,404,886	151,681	1,284,670	1,898,507	4,739,744
2012	1,599,759	160,097	1,482,635	2,060,989	5,303,480
2013	1,212,558	111,366	1,543,314	2,100,515	4,967,753
2014	1,665,273	102,419	1,484,850	1,707,330	4,959,872

Coastal Recreational Fishing License (CRFL) Sales by Residency, 2010 - 2014.

Year	<u>In State</u>	<u>Out-of-State</u>	<u>Total</u>
2010	296,173	157,346	453,519
2011	289,925	149,321	439,246
2012	304,840	155,457	460,297
2013	317,650	162,351	480,001
2014	320,664	165,623	486,287
Grandfathered ¹	250,239	6,460	256,699

¹ All lifetime inland state fishing licenses sold prior to 2007 were grandfathered into the new CRFL requirement on January 01, 2007.

Survey Methods

The survey consists of telephone and on-site angler interviews. Telephone interviews are used to collect data on number of trips, fishing location, and when these trips were made. Information on actual catch (species, number, weight, and length) is collected through on-site angler interviews. Information from both types of interviews is combined to produce estimates of total number and pounds of finfish caught.

Precision of Estimates

Numbers and pounds presented are estimates, not actual counts, therefore having varying levels of precision.



Coastal recreational fishery statistics are provided through participation in the Marine Recreational Information Program. In North Carolina, this project is supported in part by the U.S. Fish and Wildlife Service through the Sport Fish Restoration Program, Grant F-31.



North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

Donald R. van der Vaart
Secretary

MEMORANDUM

TO: N.C. Marine Fisheries Commission

FROM: Louis Daniel III, Director
Division of Marine Fisheries, NCDENR

DATE: Feb. 4, 2015

SUBJECT: Fiscal Year 2015-2016 Initiative Development

As discussed at your Nov. 2014 business meeting, attached are overviews providing information on all of the proposed ideas that commissioners put forward for consideration for initiatives for the upcoming fiscal year.

Just to recap, at its October meeting, the commission decided to develop initiatives on a fiscal year basis (July 1 – June 30) to complement the division's Strategic and Annual Operations Plan and the development of the annual fishery management plan schedule. Below is the timeline for development:

- By Dec. 31, 2014, commissioners put forward two proposals each for consideration as initiatives;
- For the Feb. 18-20, 2015 business meeting, division staff will prepare a paper on each proposal outlining the background, previous actions, summarizing pertinent points and what it would take to implement that proposal (see attached);
- For the May 20-22, 2015 business meeting, the commission selects three or four of the proposals as its Fiscal Year 2015/2016 initiatives; and
- Beginning July 1, 2015, division staff begins implementation of the agreed upon initiatives.

Marine Fisheries Commission

Fiscal Year 2015-2016 Preliminary Initiatives List

Initiatives put forward by three commissioners:

- Reduce regulatory discards in both the recreational and commercial fisheries.....page 3

Initiatives put forward by two commissioners:

- Eliminate sponge crab harvest.....page 5

- Continue to investigate whether trawling in water bodies where sedimentation has occurred could have a positive impact on reducing the sedimentation and improving water quality.....page 7

Initiatives put forward by one commissioner only:

- Reduce the culling tolerance for oysters from 10 percent to 5 percent.....page 9

- Develop hook-and-line, recreational-only artificial reefs that can be used to promote local communities and tourism (or other positive recreationally oriented initiatives).....page 10

- Develop a dedicated recreational position within the Division of Marine Fisheries (funded through Coastal Recreational Fishing License grant program) to serve as a recreational liaison, that would:
 - Be the contact person for recreational fishermen;
 - Liaison for the for hire industry;
 - Work with tourism boards;
 - Promote recreational fishing; and
 - Help council/ASFMC/HMS folks acquire recreational input on amendments and other actions.....page 12

- Reduce bycatch in the shrimp trawl fishery by 30-40 percent and revisit annually to ensure compliance with these reduction levels and continuously look for ways to further reduce bycatch.....page 14

- Increase habitat in state waters.....page 16

- Define full/part-time commercial fishermen and the purpose of the Standard Commercial Fishing License.....page 18

- Remove speckled trout from the fishery management plan.....page 21

- Establish a two season fishing period for large mesh gill nets; one in the spring and the other in late fall to help with cost of the observer program, as well as other obvious savings to the division.....page 23

- Investigate implementing an automated, user friendly & mutually beneficial observer "call-in" system for the gill-net fishery. Fishermen should be required to "call-in" if they are going to "fish" each week. The automated system should issue "confirmation numbers" to commercial fishermen who "call-in." Fishermen who fail to "call in" and report intended fishing activities should lose their permit indefinitely. Violators should be punished on a more severe, graduating scale. Furthermore, fishermen who hold a gill-net permit should be required to sign an agreement with their annual license renewal paperwork, which clearly explains the call-in process including the appropriate phone numbers.....page 25

Proposed Initiative: Reduce regulatory discards in both the recreational and commercial fisheries

Background

- Regulatory discards are those fish harvested in a fishery that fishermen are required by regulation (i.e. size limit, bag limit, trip limit) to discard.
- Reauthorization of Magnuson-Stevens Fishery Conservation and Management Act contains a National Standard (#9) requiring bycatch minimization. National Standard 9 states: “Conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.”
- Discards are addressed in all state fishery management plans.

Previous Actions or Considerations

- In 1998, the division required the use of escape panels in flounder pound nets, effectively reducing regulatory discards of undersized flounder.
- In 2011, the division implemented regulatory changes to address discards of striped bass in the commercial trawl fishery. A 2,000 pound per day trip limit replaced a 50 fish per day limit.
- In 2011, the division formed a Recreational Discards Workgroup that produced a guide to ethical angling.
 - Ethical angling information was printed in four publications for public distribution:
 - Ethical Angling: A Guide to Responsible Fishing
 - North Carolina Guide to Recreational Saltwater Fishing
 - North Carolina Coastal Recreational Fishing Digest
 - North Carolina Coastal Recreational Angler’s Guide
 - Ethical angling information also found on the division’s website (<http://portal.ncdenr.org/web/mf/edu/ethical-angling>)
- Culling panels are required in long haul seines and swipe nets in the Pamlico Sound west of Bluff Shoal.
- **Southern Flounder FMP (2005)**
 - Minimum large mesh gill net mesh size increased to 5.5 inches and prohibited the use of gill nets from 5 inches to less than 5.5 inches in internal waters from April 15 through Dec. 15 to reduce undersized southern flounder discards.
 - Minimum mesh sizes implemented for crab trawls in the Pamlico Sound to reduce undersized southern flounder discards.
- **Shrimp FMP (2006)**
 - Shrimp trawling was prohibited in most of the Neuse, Pamlico, and Pungo rivers to reduce shrimp trawl bycatch of undersized southern flounder.
- **Red Drum FMP (2001) and Amendment 1(2008)**
 - Steps were taken to reduce the mortality associated with regulatory discards including requiring circle hooks (i.e. Owen Lupton Rig) in some of the adult red drum recreational fisheries.
 - Small mesh gill net attendance rules established from the Pamlico Sound to the S.C. border from late spring to fall to reduce undersized red drum discards (attendance requirements for small mesh gill nets expanded in 2008 through Amendment 1).
 - Required large mesh gill nets be set greater than 10 feet from shore from June to October to reduce red drum discards.
- **Estuarine Striped Bass FMP (2004) and Amendment (2013)**
 - Maintained gill net restrictions in the Albemarle Sound Management Area (ex. allowable mesh sizes, yardage limits attendance requirements, season/area closures) to reduce discards of undersized striped bass and striped bass during closed seasons.

- Required the use of a 3-foot tie down in large mesh (5-inch stretch mesh and greater) gill nets and the maintenance of a minimum distance from shore of 50 yards for these nets, except Recreational Commercial Gear License large mesh nets may be set within 50 yards of shore if attended at all times for internal fishing waters west of the 76° 28.0000' W longitude line.
- Open harvest seasons for commercial and recreational fisheries during cooler months (fall, winter, and spring) to reduce discard mortality of striped bass.

Summary

- The division and the commission have implemented management measures to reduce regulatory discards in several commercial and recreational fisheries and continue to address discards in other fisheries.
- Regulatory discards can be minimized by converting discarded bycatch to landed catch through the development of new markets, processing techniques, and changing regulatory limits and requirements to land all catch.
- Regulations designed to reduce vessel efficiency including gear restrictions and trip limits may encourage bycatch (i.e. regulatory discards).
- Selective fishing gear is an essential element to bycatch reduction. The development of more selective gear can be a long process. The use of more selective gear is less effective when implemented through regulations only. Incentives to continually improve selectivity and disincentives for high levels of bycatch are more effective.
- Management programs designed to reduce regulatory discards need to be adaptive, making continuous improvements rather than fixed regulations.
- When gear modifications are made, efforts should be taken to ensure that they are effective.

Proposed Initiative: Eliminate Sponge Crab Harvest

Background

- There was a N.C. law prohibiting sponge crab harvest from the early 1920s through 1964.
- The underlying hypothesis of a sponge crab law is that protection of the spawning stock will lead to more recruits, which assumes a direct relationship between the size of the spawning stock and number of recruits.
- In 1964, the sponge crab prohibition law was repealed and Crab Spawning Sanctuaries were established.
- Landings of hard crabs showed some fluctuations before and after the sponge crab law was repealed.
- The blue crab spawning stock is composed of all mature females, not just sponge crabs.
- The sponge only present for approximately 14 days.

Previous Actions or Considerations

1989 Position Paper:

- Several questions would have to be answered if the sale or possession of sponge crabs is prohibited
 - Will there be a tolerance?
 - At what point will culling have to take place?
 - What are the effects of stress on the viability of the eggs?
 - Should the ban include all mature females?
- Studies in South Carolina showed over 98 percent of all mature females are fertile, which means they are carrying sperm plug.
- Two viable options to protect the spawning stock of blue crabs were discussed:
 - Prohibit the sale or possession of all mature females, or
 - Keep the current sanctuary system in place.
- It was felt removing the spawning sanctuaries and replacing them with a prohibition on sponge crabs would result in less protection to the spawning stock.

1993 Briefing Paper:

- The reproductive potential of fertile mature female blue crabs is the same whether or not there is a visible egg mass (sponge).
- To provide complete protection it was recommended there should be no harvest of mature females.

1998 Blue Crab Fishery Management Plan:

- An issue paper examined spawning stock protections.
- The use of spawning sanctuaries and prohibiting harvest of sponge crabs was discussed.
- The commission decided to keep current rules in place, conduct a survey to examine other potential sanctuary areas, and prohibited all commercial gear (except attended gill nets) from March 1 – August 31 in existing spawning sanctuaries.

2004 Blue Crab Fishery Management Plan Amendment 1:

- The sanctuary rule was modified to include commercial gear prohibitions from 1998 fishery management plan.
- No additional sanctuaries were identified, as recommended in 1998 fishery management plan.
- An issue paper reexamined spawning stock protections.
- Research showed sponge crabs will destroy the egg mass once captured in pots (Rittschof 2004).
- Trawl-caught sponge crabs were observed with damaged egg masses.
- Eggleston (2003) found no significant difference in mature female catch rates within the sanctuaries and an area 5 km outside the sanctuaries.

- The commission decided to use the division's Program 195 (Pamlico Sound Survey) as an indicator of spawning stock health, implement a seasonal maximum size of 6.75 inches for mature females and 5.25 inches for female peeler blue crabs (implemented when trigger from Program 195 is reached), and to modify the current sanctuary boundaries.

2013 Blue Crab Fishery Management Plan Amendment 2:

- Seasonal size limit for mature females and female peeler blue crabs were implemented in January 2006 and remained in effect through April 2014.
- Sanctuary boundaries were not modified as recommended in Amendment 1.
- The commission decided to repeal management triggers established in Amendment 1 and adopt adaptive management framework using the Traffic Light method as an indicator of the stock condition.
- Under the moderate management level (production characteristic 50 percent red for three consecutive years) the following measures go into effect: sponge crab harvest may be restricted, minimum and/or maximum size for mature females would be implemented, and spawning sanctuaries may be closed and further restrictions imposed.
- Under elevated management level (production characteristic 75 percent red for three consecutive years) a prohibition on sponge crab harvest and/or require use of sponge crab excluders would be implemented and may expand or designate new crab spawning sanctuaries.

Summary

- The current fishery management plan will implement limits on sponge crab and mature female harvest and allow additional management of the spawning sanctuaries if management triggers are activated under the adaptive management framework.
- North Carolina replaced the sponge law with spawning sanctuaries in 1964.
- The egg mass, or sponge, is only present for approximately 14 days.
- Over 98 percent of all mature females are fertile, which means they are carrying a sperm plug.
- Since the sponge is only present for a short period, any prohibition on sale or possession should include all mature females, not just sponge crabs.
- Studies indicate that after capture the sponge is damaged and/or shed.
- The current sanctuary system protects all spawners in the area, not just sponge crabs.
- There are some questions about boundaries of Crab Spawning Sanctuaries and their effectiveness in protecting the female spawning stock.
- Limiting sponge crab harvest would protect the crabs outside of the sanctuaries.

Proposed Initiative: Continue to investigate whether trawling in waterbodies where sedimentation has occurred could have a positive impact on reducing the sedimentation and improving water quality

Background

- In August 2013, the Marine Fisheries Commission passed motion for the Division of Marine Fisheries to design a study comparing closed trawling areas, specifically Newport River, to open trawling areas to determine the effect of trawling on sedimentation in primary and secondary nursery areas.
- Since the 1980s fishermen have stated that waterbodies closed to trawling are silting in and declining in productivity.
- The intent of the motion was to test if trawling could be a tool to flush out sediment and improve fishery productivity.
- Other waterbodies that have been mentioned by other entities as having sedimentation problems include Futch Creek, White Oak River, Bradley Creek and Lockwood Folly River.
- Upper portions of many tidal creeks were closed to trawling and dredging by Marine Fisheries Commission nursery area rules in 1977 to protect shallow nursery habitat.
- Division staff decided to compile an information paper on the subject to provide direction regarding future studies on sedimentation and trawling.

Previous Actions or Considerations

1999 Trawling Report:

- At the request of the Marine Fisheries Commission, division staff compiled a report, Shrimp and Crab Trawling in North Carolina's Estuarine Waters (N.C. Division of Marine Fisheries 1999) to determine the effects of trawling on habitat and bycatch.
- The report concluded that research in North Carolina was needed to determine this, and due to the high variability of N.C.'s estuaries, would cost \$1million to \$2 million a year to fund. No funding was allocated.
- Several short term research projects developed out of this effort specific to the effect of trawling on turbidity, sedimentation, and some aspect of productivity and are summarized in the 2014 information paper.

2005/2010 Coastal Habitat Protection Plan:

- Summarized the effects of trawling on bottom habitat.
- Summarized the effects of sedimentation and turbidity on fish habitat and known sources of sedimentation.
- Sources were reported to be from land disturbance, particularly non-point runoff from agriculture, forestry, and development, as well as wastewater discharges, navigational dredging, and bottom disturbing fishing activities.
- Includes several recommendations to reduce point and non-point source pollution, including sediment, as well as recommendations to protect fish habitat functions from damage associated with dredging and to restore shallow nursery habitat.

2014 Information Paper:

- Summarized research done in North Carolina and elsewhere on effect of sedimentation on productivity and effectiveness of trawling as a tool to flush out excessive sediment.
- Studies have documented the rate and source of sedimentation in Newport River, Slocum Creek, and Hancock Creek. Rates were considered relatively high and related to land disturbance from development and forestry.
- Studies on the effect of trawling on sediment dynamics were done in South Creek, Texas, and Florida. Results found that turbidity increased one to three times greater than background. Under conditions of sandy sediments or low currents, resuspended sediment settled fairly quickly and

close to the point of disturbance; conversely, sediments were resuspended longer and transported further when currents were strong and sediment was muddy. Fate of resuspended sediment (whether it is flushed out of a creek, carried further upstream, or redeposited nearby) will depend on many factors, such as tide range, currents, orientation of waterbody to prevailing wind direction, fetch, and sediment type.

- Studies on the effects of trawling on primary productivity in North Carolina found no clear trend. In terms of secondary productivity, trawling had no significant effect on secondary productivity (benthic infauna) in North Carolina, Texas, and South Carolina. None of the studies found a negative effect on larger macroinvertebrates and one study in North Carolina found a positive effect.
- Limited information is available on whether juvenile fish productivity has declined over time in North Carolina.
- The information paper concluded that a conservative approach was needed since 1) the literature review did not reveal strong indication that trawling would effectively flush out sediment or improve productivity and 2) there could be implications to other habitat protection rules if trawling was allowed in Primary Nursery Areas.
- The paper recommended that prior to conducting trawling experiments, further research is needed to:
 - Determine magnitude and change in sedimentation rates and sources over time at sufficiently representative waterbodies and regions.
 - Determine the effect of sedimentation in the upper estuaries on primary and secondary productivity and juvenile nursery function.
- The paper recommended that any resulting trawling study:
 - Design the study with academia and have process to include peer development/review.
 - Develop a clear testable hypothesis.
 - Develop a statistically valid sampling design that represents North Carolina's variable waterbody characteristics and accounts for temporal and spatial variability.
 - Assess effects of trawling at effort levels similar to typical fishery conditions.
 - Track the transport of sediment over multiple tide cycles.
 - Monitor transport of bacteria and toxins due to sediment resuspension.
 - Locate study areas in Secondary Nursery Areas or Special Secondary Nursery Areas that have not been open for multiple years.

Summary

- Division staff agrees that sedimentation is an issue to assess and address and will take steps this year to address information gaps.
- The division plans to work with university researchers to develop a phased Coastal Recreational Fishing License grant proposal that will address information gaps, and pending those results, a trawling experiment study.
- Division staff plans to further analyze juvenile fish data to assess trends in juvenile fish abundance.
- The Coastal Habitat Protection Plan Steering Committee selected sedimentation as a priority issue to address in the 2015 Coastal Habitat Protection Plan.
- This issue will be added to the division's Biological Review Team's Research Priority List.

Proposed Initiative: Reduce the culling tolerance for oysters from 10 percent to 5 percent

Background

- 15 A NCAC 03K. 202 requires a 10 percent tolerance by volume.
- The culling tolerance has been incorporated in rule at least since 1927.
- During the early years it was set at 5 percent. Between 1931 and 1934 the culling tolerance changed to 10 percent around the same time as the change in size limit from 2 ½ inches to 3 inches.
- Between 1971 and 1975, the culling tolerance for the 2 1/2 inch coon oysters was 15 percent. Prior to 1971 there was no size limit on coon oysters and therefore no culling tolerance on coon oysters.
- Law enforcement officers inspect fishermen for exceeding the tolerance limit by using a certified metric bushel tub and a keeler which is 10 percent of the tub by volume. A bushel of oysters is dumped into the metric bushel tub. The officer culls sub-legal oysters from the bushel and places them into the 10 percent keeler. If the keeler becomes full before the metric bushel is empty the catch is over the 10 percent tolerance. The officers will dump the keeler into another container and continue grading the rest of the oyster to find the total percent of undersized product.
- If the product exceeds 10 percent the officers will judge the level of oysters in the second keeler to figure the overage.

Previous Actions or Considerations

- Was not an issue in previous Oyster Fishery Management Plans, amendments, or supplements.
- Changing from 10 percent tolerance to 5 percent tolerance will require a change in keeler size to reflect 5 percent tolerance.
- Keelers are made of galvanized steel and cost approximately \$25.
- Difficult in the south to change from 10 percent to 5 percent because of the intertidal nature of the southern coastal oysters.
- Intertidal oysters are in the form of clusters. Changing from the 10 percent tolerance to the 5 percent tolerance will result in finer separation of sub-legal from legal more difficult and would result in higher mortality of sub-legal oysters because of increased damage to the shell.
- May be possible to lower culling tolerance to 5 percent north of the Highway 58 Bridge. Oysters occur more subtidal as single oysters. Therefore less difficult to separate sublegal from legal oysters

Summary

- Concerns over increased effort in the south causing damage to cultch plantings and oyster rocks.
- Bushel limit changes are also an issue under consideration under Amendment 4 of the Oyster Fishery Management Plan.
- In the southern area bushel limits are currently five bushels per person/10 bushel per vessel.
- This has lead to concerns of the implications of a \$31.25 shellfish license and the availability of this license to any N.C. resident.
- Culling tolerance will be addressed in an issue paper discussing harvest and effort issues in the southern coastal area.

Proposed Initiative: Develop hook-and-line, recreational-only, artificial reefs that can be used to promote local communities and tourism (or other positive recreationally oriented initiatives)

Background

- In late winter of 2007 an interaction between a recreational fisherman and gill nets occurred on AR-425 (Yaupon Beach Reef) and AR-420 (Tom McGlammery Reef). This resulted in the introduction of House Bill 2153 entitled: An Act to Prohibit Commercial Fishing Near Artificial Reefs within Three Nautical Miles of the Shoreline of Brunswick County. In response, the Fisheries Director issued proclamation M-23-2008 prohibiting the use of gill nets or trawls in the area of AR-425. This proclamation has been issued annually since.
- In 2013, Ron Zielinski submitted a Petition for Rulemaking to the N.C. Marine Fisheries Commission. This petition entailed restricting the use of commercial fishing gear and additional gear (i.e. minnow traps, collapsible crab traps, cast nets, gigs or pointed implements, hand operated rakes, seines less than 30 feet in length, manual or mechanically propelled spears and trotlines) on and around AR-396.
- On Aug. 29, 2013, at a commission meeting, a motion to approve the Ron Zielinski petition for rulemaking was made because of the following reasons: 1) to support beneficial economic impact to the surrounding community; 2) to improve angler access to dedicated accessible and quality fishing opportunities; and 3) to be proactive in avoidance of future conflicts. The motion carried 6-2, with 1 abstention.
- On May 22, 2014, at a commission meeting, a motion was made to accept Ron Zielinski's request to withdraw his petition for rulemaking regarding the Oriental artificial reef and to stop further rulemaking on the issue. The motion carried 9-0.

Authority

- Sufficient authority for the commission to develop recreational, hook-and-line-only artificial reefs does not currently exist in rule, but there is sufficient statutory authority for the commission to adopt rules "to regulate the location and utilization of artificial reefs in coastal waters." [G.S. 143B-289.52(b)(10)]
- The rule making process, as set forth in G.S. 150B (Administrative Procedure Act) includes completing an economic analysis of the proposed rule change, publishing the proposed rule in the *N.C. Register*, providing a public comment period, and ensuring compliance with the rulemaking principles in G.S. 150B-19.1(a).

Considerations

- In addition to considering the requirements of the rulemaking process, other factors such as funding sources, traditional fishing areas, impacts to local economies, impacts to commercial fishermen and access should be considered.
- Artificial reefs have been funded using a variety of funds including but not limited to, state appropriated money, sport fish restoration funds and grants from both state and federal agencies.
- Declaring an artificial reef hook-and-line, recreational-only, will exclude user groups, both recreational and commercial, from access to a public trust resource.
- Recreational fishermen will not be able to use gears such as gill nets, crab pots, spears and gigs to harvest their recreational limit.
- Funding sources should be considered when planning and developing hook-and-line, recreational-only, artificial reefs since use by user groups will be limited.
- Interest could be sparked from other user groups to construct reefs for sole usage by their respective user groups.
- Partnering with the N.C. Division of Marine Fisheries is a requirement since Coastal Area Management Act, United States Army Corps of Engineers and Coast Guard (Private Aids to Navigation) permits for artificial reefs are issued to the N.C. Division of Marine Fisheries.

- The process to site, permit, obtain materials, construct and monitor an artificial reef site is costly and time consuming.
- From previous experience, total inshore artificial reef construction cost ranges from \$31,000 and \$50,000 per acre depending on complexity, reef structures and location.

Summary

- Developing hook-and-line, recreational only, artificial reefs will require the commission to develop rules through the rulemaking process.
- There is the possibility of other user groups requesting to build artificial reefs for their exclusive use, which would exclude other user groups from a public trust resource.

Proposed Initiative: Develop a dedicated recreational position within the Division of Marine Fisheries

Develop a dedicated recreational position within the Division of Marine Fisheries (funded through Coastal Recreational Fishing License grant program) to serve as a recreational liaison that would:

- Be the contact person for recreational fishermen;
- Liaison for the for hire industry;
- Work with tourism boards;
- Promote recreational fishing; and
- Help council/Atlantic States Marine Fisheries Commission/Highly Migratory Species folks acquire recreational input on amendments and other actions.

Background

- Coastal Recreational Fishing License Grant submitted in FY2011 (not selected for funding); internal pre-proposal submitted in FY2012 (not selected for full proposal).
- Previous proposals focused on several areas: providing technical/policy guidance regarding recreational fisheries; development and coordination of data collection programs for recreational fisheries; promote conservation-based fishing practices; and development of positive relationships with the recreational fishing community.
- National Oceanic and Atmospheric Administration (NOAA) Fisheries has a similar national policy position that is responsible for coordination of regional recreational fisheries policy staff and oversight of NOAA Fisheries Recreational Initiative (launched 2009).

Previous Considerations/Actions

- Division currently has a five-year federal aid grant (Marine Fisheries Education and Outreach) that provides support for classroom education programs, development and printing of educational brochures/materials (e.g., ethical angling, Angler's Guide, etc.), exhibits at festivals, expanding/improving educational web pages.
- Governor's Cup Billfishing Series and N.C. Saltwater Fishing Tournament (Citation Program) provide informal outreach to private anglers and for-hire sector.
- Coastal Angling Program (recreational harvest data collection program) staff provide informal (dockside sampling) and formal (for-hire constituent outreach and logbook public meetings) outreach to private anglers and for-hire sector, as well as weekly regional fishing reports throughout the season.

Potential Activities

Policy

- Coordinate development of a comprehensive strategic plan for N.C. recreational fisheries across all division sections with the goal of proactively identifying recreational fishery issues of importance and initiating guidance/policy to address these issues (outreach, communication, education, technology).
- Provide guidance/input on recreational fishery characterization for all state fishery management plans in conjunction with fishery management plans and species leads.
- Serve as the division point-of-contact for:
 - Recreational fishing information for anglers, recreational fishing organizations, for-hire industry, tournaments, tourism, etc.
 - Federal efforts related to NOAA Fisheries National Recreational Fishing Policy (http://www.nmfs.noaa.gov/sfa/management/recreational/documents/recfish_policy_public_comment_draft.pdf), and provide NC perspective regarding implementation of the Southeast Regional Recreational Fisheries Action Agenda (http://www.nmfs.noaa.gov/sfa/management/recreational/documents/noaa_rfaa_ser.pdf).

- Provide policy level guidance on interstate and federal fishery management issues in coordination with federal council and interstate commission liaisons.

Communication

- Coordinate public input from recreational constituents (anglers, organizations, for-hire) on state, interstate and federal fishery management decisions.
- Improve communication with all recreational constituencies through organized workshops, seminars, and invited speaking engagements on management issues, conservation-based fishing practices, habitat enhancement/protection, etc.
- Develop a regular “on the docks” schedule of informal interaction with private anglers, for-hire captains, tackle shop owners, tourism operators, etc.
- Coordinate with other agencies, local governments and recreational fishermen to identify, enhance, conserve and develop recreational fishing access.

Outreach

- Assess the use and effectiveness of the current recreational compliance guides and recreational outreach materials in conjunction with public affairs staff.
- Develop a distribution system of recreational compliance guides and recreational outreach materials with input from anglers, the for-hire industry, and tourism.
- Coordinate with other state partners (N.C. Sea Grant, academic researchers, and other state agencies) to disseminate results of the Coastal Recreational Fishing License grant program and provide a conduit for input into the program’s strategic plan.

Education

- Enhance education of fishermen and the public concerning fish habitats, how they function, and what people can do to protect them.
- Assist in cross-section initiatives to develop and disseminate gear and methodology for reducing release mortality and to reduce protected species interactions.
- Work with stock assessment scientists to develop outreach materials (similar to Marine Resource Education Program in southeast) to ensure a clear understanding of the stock assessment process for state-managed fisheries.
- Enhance education of fishermen and advise them of the public health and safety concerns surrounding naturally occurring bacteria with consumption of raw shellfish and swimming or water contact activities.

Summary

- Ultimate goal is that recreational constituents who understand the fishery management process, data collection, habitat function, conservation techniques and practices will be more informed and feel a sense of inclusion in the management process.
- Previous attempts to fund such a position have not met with success (ultimate approval of new positions typically occurs at department level)
- Division currently has a variety of recreationally-oriented education/outreach initiatives and should evaluate effectiveness of funded activities; re-program existing staff and resources towards more effective efforts based on review and constituent input.
- Potential benefits: Coordination with federal initiatives, other agencies, local governments and recreational fishermen to identify, enhance, conserve and develop recreational fishing opportunities; comprehensive plan for all division efforts related to recreational fisheries; increased understanding and improved communication between commission, division and recreational sectors.
- Potential challenges: Representing the diverse opinions of the recreational fishery; commercial sector opposition to creating a recreational liaison without creating a commercial liaison; stock management goals may differ between recreational sectors; communication with the widely dispersed and diverse recreational fishery.

Proposed Initiative: Reduce bycatch in the shrimp fishery by 30-40 percent and revisit annually to ensure compliance with these reduction levels and continuously look for ways to further reduce bycatch.

Background

- Reauthorization of Magnuson-Stevens Fishery Conservation and Management Act contains a National Standard (#9) requiring bycatch minimization (USDOC 1996). National Standard 9 states: “Conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.” The act was amended in 1990 to include bycatch research.
- In 1990, Congress mandated that the U.S. Secretary of Commerce conduct a three year research program to assess the impact of the incidental harvest by the shrimp trawl fishery on fishery resources in the South Atlantic and the Gulf of Mexico areas.
- The National Marine Fisheries Service, along with the Gulf and South Atlantic Fisheries Development Foundation, began a cooperative bycatch research program to: (1) update and expand bycatch estimates temporally and spatially; (2) identify, develop and evaluate gear options for reducing bycatch; (3) develop an information transfer and education program on bycatch; and (4) develop and operate a standardized data management system for centralized dissemination and access.
- Starting in 1992, observers were placed aboard cooperating vessels to characterize bycatch and to test bycatch reduction devices during normal commercial shrimp trawling through a NOAA program.

Previous Actions or Considerations

- During the 1960s and early 1970s, there was a primary bycatch concern was from directed ocean finfish trawling for bait and pet food.
- During the 1970s through the 1990s, rules were established to prohibit directed scrap fishing. Nursery area designation also began during this time.
- During the late 1980s, the division initiated gear testing to reduce bycatch in the shrimp trawl fishery.
- In cooperation with personnel from the North Carolina Sea Grant, an industry advisory committee was established in 1989 to act as consultants throughout the design and testing phase of a gear development project to reduce bycatch in N.C. trawl fisheries. The committee suggested two finfish excluding techniques: skylight panels and large mesh tailbags.
- Since 1972, the commission regulates the minimum mesh size for a shrimp trawl, including the tailbag at 1.5 inches (15A NCAC 03L.0103(1)).
- The division conducted preliminary tests on diamond tailbag mesh sizes in 1991, square mesh tailbags in 2000, and conducted follow up work in 2010.
- The commission required all shrimp trawlers working in state waters to equip their nets with functional fish excluders in October 1992, becoming the first state to do so.
- From 1992-1996 the division worked with fishermen to develop and test several bycatch reduction devices to reduce finfish bycatch. These tests led to the commission approving four bycatch reduction devices for use in state waters in 1996 (Proclamation SH-9-97).
- Currently the division allows five bycatch reduction devices for use in state waters (Proclamation SH-3-2012).
- Several gear evaluation studies have also been conducted in N.C. waters to document bycatch in shrimp trawls (McKenna and Monaghan 1993; Coale et al. 1994; Murray et al. 1995; McKenna et al. 1996, Brown 2010).
- In 2009, the division tested various bycatch reduction devices aboard the R/V Carolina Coast (Brown 2010).

- In 2012, the commission directed the division to amend the Shrimp Fishery Management Plan, but to limit the scope of the amendment to bycatch issues. Twenty-nine different management options were brought forward to the Shrimp Fishery Management Plan Advisory Committee to address eight different issues. The commission's preferred management strategies to reduce bycatch included:
 - Allowing any federally certified bycatch reduction devices in all N.C. internal and offshore waters;
 - Update the scientific testing protocol for the state Bycatch Reduction Device Certification Program;
 - Convene a stakeholder group to initiate industry testing of various bycatch reduction devices to reduce bycatch to the extent practicable with a 40 percent target reduction;
 - Require either a T-90/square mesh tailbag or other applications of square mesh panels, reduced bar spacing in a turtle excluder device, or another federal or state certified bycatch reduction device in addition to existing turtle excluder device and bycatch reduction device requirements; and
 - Cap fleet capacity by establishing a maximum combined headrope of 220 feet in all internal coastal waters where there are no existing maximum combined headrope requirements with a two-year phase in period.

Summary

- Policies at both the state and federal level have been adopted as conservation and management measures to minimize bycatch and bycatch mortality and incorporate that goal into management considerations.
- The control of net selectivity is a preferred management tool in lieu of other more stringent regulations such as temporal or spatial closures, quotas, or limited entry.
- The division has tested various bycatch reduction device designs since the 1980s. Testing has been sporadic based on funding.
- Development of bycatch reduction devices must be tested in many areas and over several seasons, since there is considerable variation in conditions both spatially and temporally.
- It is important to understand that the development of bycatch reduction devices is a long process, and is dependent on a number of factors.
- There is no one gear design or modification that will work in every situation. What works during the summer brown shrimp fishery may not be effective in the fall white shrimp fishery. The goal of gear researchers is to give the industry additional tools and techniques to use under various real life field situations.
- Funding is often a limiting factor for gear development programs. The division has very limited resources to conduct bycatch reduction device development testing.
- The division has and will continue to seek outside funding to conduct this type of research.
- The division has and will continue to seek outside funding to conduct characterization studies which can be used to ensure compliance with reduction levels.

Proposed Initiative: Increase Habitat

Background

There are six categories of coastal fish habitat in North Carolina – wetlands, shell bottom (oyster reef), submerged aquatic vegetation, ocean hard bottom, soft bottom, and the water column. Much of the work the division does deals with restoring and enhancing shell bottom habitat. The type, magnitude and location of created shell bottom habitat varies annually based on available funding. The division's restoration and enhancement work helps to fulfill recommendations of the Coastal Habitat Protection Plan, which was mandated by the 1997 Fisheries Reform Act. The Act contains the directive to protect and enhance habitats supporting coastal fisheries through the development and implementation of the Coastal Habitat Protection Plan. The law requires cooperation among three rule-making commissions: Environmental Management Commission, Coastal Resources Commission, and Marine Fisheries Commission. The commissions work together to develop, adopt, and implement the plan to protect and restore fish habitats through efforts of an interagency staff team and a steering committee consisting of a subset of the associated commissioners. While restoration of shell bottom habitat is addressed primarily by the Division of Marine Fisheries, restoration of other habitats is addressed by others or through mitigation or projects by conservation groups or universities. For example, the Division of Water Resources and the Ecosystem Enhancement Program are the primary groups that address wetland restoration. Through the Coastal Habitat Protection Plan process, encouragement of greater restoration of certain habitats can be discussed and recommended.

Previous Actions or Considerations

Specific Coastal Habitat Protection Plan recommendations that address increasing habitat and reducing sediment from entering coastal waters (sediment can enter through point and non-point sources), include:

- Expand habitat restoration in accordance with ecosystem restoration plans, including:
 - a. Creation of subtidal oyster reef no-take sanctuaries.
 - b. Re-establishment of riparian wetlands and stream hydrology.
 - c. Restoration of submerged aquatic vegetation habitat and shallow soft bottom nurseries.
 - d. Developing compensatory mitigation process to restore lost fish habitat functions.
- Prevent additional shellfish and swimming closures through targeted water quality restoration and prohibit new or expanded stormwater outfalls to coastal beaches and to coastal shellfishing waters (Environmental Management Commission's surface water classifications SA and SB) except during times of emergency (as defined by the Division of Water Quality's Stormwater Flooding Relief Discharge Policy) when public safety and health are threatened, and continue to phase-out existing outfalls by implementing alternative stormwater management strategies.
- Enhance coordination with, and financial/technical support for, local government actions to better manage stormwater and wastewater.
- Improve strategies throughout the river basins to reduce non-point pollution and minimize cumulative losses of fish habitats through voluntary actions, assistance, and incentives, including:
 - a. Improved methods to reduce pollution from construction sites, agriculture, and forestry.
 - b. Increased on-site infiltration of stormwater.
 - c. Documentation and monitoring of small but cumulative impacts to fish habitats from approved, un-mitigated activities.
 - d. Encouraging and providing incentives for low impact development.
 - e. Increased inspections of onsite wastewater treatment facilities.
 - f. Increased water re-use and recycling.
- Improve strategies throughout the river basins to reduce non-point pollution and minimize cumulative losses of fish habitats through rule making, including:
 - a. Increased use of effective vegetated buffers,
 - b. Implementing and assessing coastal stormwater rules and modify if justified.
 - c. Modified water quality standards that are adequate to support submerged aquatic vegetation habitat.

Summary

- The initial Coastal Habitat Protection Plan was completed and approved in 2005 and updated in 2010. As the next five-year update is scheduled for completion in 2015, there is an opportunity to modify plan recommendations and implementation actions related to creating additional coastal fish habitat.

Proposed Initiative: Defining Full-Time and Part-Time Commercial Fishermen and the Purpose of the Standard Commercial Fishing License (SCFL)

Background

- In 2010 and 2012, two ad hoc Marine Fisheries Commission committee meetings were held to discuss the issue of defining a professional commercial fishermen and make changes to the Standard Commercial Fishing License (SCFL)
- The general consensus among attendees was that there are no significant problems with the current definition that requires fixing. The current definition and license system as devised by the Moratorium Steering Committee in 1999 is adequate. [see G.S. 113-168.2 (h) Identification as a Commercial Fisherman - The receipt of a current and valid SCFL or shellfish license issued by the division shall serve as proper identification of the licensee as a commercial fisherman].
- Although neither committee made any significant changes to the current system, there were some recommendations to investigate license transfers, license assignments, how to handle latent licenses (use it or lose it), establishing some form of apprenticeship program, and to consider eliminating the Shellfish License for N.C. residents.

Previous Actions

- **July/August 2010 Taskforce Meetings** – chaired by Joe Smith
 - Making changes to the definition of a commercial fisherman is always a contentious issue.
 - The industry feels that:
 - The definition is fine as is.
 - There is no reason to establish landing limits or frequency of use to exclude part-timers as there are many reasons why people hold commercial licenses: investment for retirement, for later use, to pass down to future generations, or as a side-line business to their land-based employment.
 - Further limiting available licenses and limited entry fisheries are not popular concepts.
 - License transfers should be limited to family only.
 - License assignments are necessary.
 - The revenue from latent licenses is necessary to the division.
- **January 2012 Taskforce Meeting** – chaired by Rob Bizzell
 - Industry members in attendance reiterated that the problem has not been defined and if it isn't broken, then don't try to fix it.
 - Much discussion ensued about impact of less knowledgeable commercial fishermen on the industry using the striped bass trawler episode as an example.
 - Three [non-binding] motions were made and passed by the committee:
 - Require all individuals who held a SCFL during the 2010 license year that had no recorded sales transactions be required to have at least 12 days of documented fishing activity within a three-year time period in order to renew their licenses.
 - The commission shall explore the concept of developing an apprentice program/license for persons who have no history in commercial fishing, and allowing an individual with an apprentice license to qualify for a SCFL issued through the eligibility pool once the apprenticeship is completed.
 - The commission should consider eliminating the Shellfish License for N.C. residents.

Constraints and Considerations

- The current commercial license system has been in place since 1999 and is based on recommendations by the Moratorium Steering Committee and resultant actions by the General Assembly.
- The system as implemented has many good points and is in general favor by the commercial fishing industry.

- The following is a list of the main points of discussion and constraints upon any actions:
 - The current definition of a commercial fisherman simply says one who holds a license. Most people feel this is adequate but also see problems with adolescents holding licenses, recreational fishermen holding licenses, and the large number of unused licenses. The discussion should be focused on what constitutes a “professional” commercial fishermen and could include such criteria as: relying on proceeds from commercial fishing for the bulk of their annual salary, reporting income to the IRS from commercial fishing, an individual fully licensed and permitted to operate in one or more fisheries, and an individual with the knowledge, education or experience to profit from commercial fishing. How each of these criteria is determined is currently unknown. In addition, any definition must include criteria for professional crew members who may or may not have any licenses or recorded landings.
 - Can the commission eliminate or reduce the number of available licenses? Yes, the commission has the authority to adjust the number of SCFL’s in the pool based on the amount of effort it considers appropriate in the fishery. The difference between the number of SCFLs in the pool and the number of active licenses is around 1,500. The commission cannot refuse to renew a license.
 - Can license transfers be restricted to family and transfers to non-qualified individuals prevented? This is addressed in GS 113-168.2 (g) which describes the allowable reasons for license transfers (family, upon death, or sale of vessel upon retirement). Seventy-two percent of license transfers are categorized as “Other.” This allowance was a legal interpretation due to discrepancies in the interpretation of “retirement” and because not all license holders had an accompanying vessel to sell with the license. This could be revisited.
 - Part time commercial fishermen play an important role and should not be discouraged. Traditionally, commercial fishermen in North Carolina have always held other money making jobs in order to support their families. Part time fishermen provide valuable product to dealers and to the market when conditions allow.
 - There should be no “use-it or lose-it” clause as fishermen hold licenses for a variety of reasons - investment, holding for retirement years, to assign to others, etc. Unused licenses have no impact on the resource yet contribute to the division’s operating revenue. Forcing license holders to use their license will put more pressure on the resource and more gear in the water. SCFL holders have made the decision to spend the money to renew the license each year and therefore have an investment in that license. The revenue derived from commercial licenses is critical to the division to fund the license, trip ticket and marine patrol activities. Commercial license revenue has been on the decline in recent years and there is concern that recent increases in license fees will create further reduced revenue for the division. [follow-up: the division conducted a survey of license holders in January 2015 asking about product retained for personal use and not reported on trip tickets]
 - Establishing income levels for license qualification is unpopular and unfeasible. This is similar to establishing “days used” or a “use-it or lose-it” policy. Using income levels requires holders to substantiate their claims with tax records which in turn require someone to determine the validity of the tax records. The division does not wish to get involved in personal tax filing issues. Establishing a minimal threshold of days the license is required to be used could not only increase pressure on the resources but lead to falsified recording of catch on trip tickets in order to meet the minimal criteria.
 - Establishing an Apprenticeship Program in order to get new entrants into the fishery received general support. However, the division feels as though the current Shellfish License and proper use of assignments provides most of the benefits of an apprentice program. Neither of these licenses requires any

previous qualifications. A true apprenticeship program will require someone to function as the mentor, a role best fulfilled by commercial fishermen, not the division. The industry could still support this concept by hiring individuals as crew or by assigning licenses and eliminate the division from the program. The experience gained by working as crew or working under an assignment would qualify the individual for a SCFL through the Eligibility Board.

- The issue of recreational fishermen obtaining SCFL's on the open market and using them to sell fish to cover their fuel costs and save on taxes on tackle and equipment was also discussed extensively. This issue probably is of less importance today as the South Atlantic Fisheries Management Council has almost entirely eliminated bag limit sales of most federally managed species. Purchasing a commercial license in order to save on fuel and tackle costs is a federal and state taxing authority issue, not a division management issue.
- Should the Shellfish License be eliminated? This low cost license available only to N.C. residents was meant by the General Assembly to appease the older, traditional, clambers and oystermen who may not have qualified for a SCFL but still wanted a low cost license to gather some shellfish. It was also intended to be a license available to high school and college students to use to make some money during the summer months clamming. Eliminating this license will negatively impact applicants to the Eligibility Board and the apprenticeship program concept of entering into commercial fishing by obtaining a Shellfish License. It will have the positive benefits of reducing harvest pressure on diminishing oyster resources in the southern part of the state and reducing illegal oyster sales.

Summary

- There have been previous attempts at defining a commercial fisherman and making changes to the current license system. It is a heated topic and any changes should not be considered lightly.
- Given the commission's authorities, the most logical and achievable options to look at to address certain issues are:
 - Reduce the number of available SCFLs in the Eligibility Pool
 - Limit license transfers
 - Limit license assignments
 - Address inequities in licensing costs between residents and nonresidents (especially with Land or Sell license privileges)
- Changes to the following authorities will require legislative changes to existing statutes:
 - Limiting renewals of existing SCFLs
 - Further increases in license fees
 - Adjustments to nonresident fees
- Fee increases beginning in fiscal year 2016 will impact the number of licenses issued, especially those SCFLs that are not used. Any reductions in commercial license sales will further negatively impact division revenue and its ability to adequately implement and enforce fisheries regulations.

Proposed Initiative: Remove Spotted Seatrout from the Fishery Management Plan

Clarify intent of initiative

Intent of the initiative is to change management strategy for spotted seatrout outlined in the 2012 N.C. Spotted Seatrout Fishery Management Plan, which is based on the threshold biological reference point of a spawning potential ratio of 20 percent to managing spotted seatrout based on environmental factors.

Background

- The Atlantic States Marine Fisheries Commission Fishery Management Plan for Spotted Seatrout was adopted in 1984 and was updated with Amendment 1 in 1991 and Amendment 2 in 2011.
- Amendment 1 developed a list of goals for spotted seatrout management, but allowed interested states to manage their stocks independently.
- Amendment 2 required states to comply with the Atlantic Coastal Fisheries Cooperative Management Act and the Atlantic States Marine Fisheries Commission Interstate Fishery Management Program Charter, adopt a 12-inch total length minimum size limit for both recreational and commercial sectors and recommended states establish management measures to reach a 20 percent spawning potential ratio.
- Spotted seatrout was included in both the 2002 and 2008 N.C. Interjurisdictional Fishery Management Plan.
- The N.C. Marine Fisheries Commission adopted the fishery management plan schedule that provided for the development of a state spotted seatrout plan as a means to evaluate if regulations were sufficient to provide a sustainable harvest. Initial plan development began in 2007.
- The N.C. Spotted Seatrout Stock Assessment was completed in January 2009. The stock was considered overfished and overfishing had been occurring all but one year during the entire time series of the assessment (1991 – 2008) using a threshold biological reference point of 20 percent spawning potential ratio.
- The N.C. Marine Fisheries Commission adopted the N.C. Spotted Seatrout Fishery Management Plan in February 2012.
- The N.C. Marine Fisheries Commission adopted Supplement A to the 2012 Spotted Seatrout Fishery Management Plan in March 2014.

Previous Actions or Considerations

- Supplement A to the 2012 N.C. Spotted Seatrout Fishery Management Plan implemented the following measures:
 - Maintain short-term management measures in the spotted seatrout fishery (Proclamation FF-13-2012: 14-inch minimum size, 75-fish commercial trip limit with weekend closures in joint waters except in Albemarle and Currituck sounds; Proclamation FF-12-2012: 14-inch minimum size, four-fish recreational bag limit).
 - If cold stun occurs: close spotted seatrout harvest through June 15 and retain four fish recreational bag limit and 75 fish commercial trip limit. Also more extensive research on cold stun events by the division, universities, etc...
 - Revisit the Spotted Seatrout Fishery Management Plan in three years to determine if sustainable harvest measures are working.
 - Development of a mutual aid agreement between Marine Patrol and Wildlife Enforcement Officers for Inland Fishing Waters.
- December 2014 an updated 2014 N.C. Spotted Seatrout Stock Assessment was sent for external peer review.
- The commission's fishery management plan review schedule, adopted in August 2014, has the next spotted seatrout review scheduled to begin in July 2015.
- The N.C. Fisheries Reform Act states "The Department shall prepare proposed Fishery Management Plans for adoption by the Marine Fisheries Commission for all commercially or recreationally significant species...." [G.S. 113-182.1].

- The N.C. Fisheries Reform Act states that if overfishing is occurring the fishery management plan must “specify a time period, not to exceed two years from the date of adoption of the plan, to end overfishing.” and if a fishery is considered overfished, the fishery management plan must “specify a time period, not to exceed 10 years from the date of the adoption of the plan, for achieving sustainable harvest.” The statute provides that these requirements shall not apply “if the Fisheries Director determines that the biology of the fish, environmental conditions, or lack of sufficient data make implementing the requirements of this subdivision incompatible with professional standards for fisheries management.” [G.S. 113-182.1].
- These provisions exempt a species from the two year period to end overfishing and the 10-year rebuilding period, not from the requirement to have a fishery management plan.
- Any adaptive management strategy designed to manage spotted seatrout based on environmental factors would likely need to be reviewed periodically. The best vehicle for this process is the species-specific state fishery management plan.

Summary

- North Carolina is currently in compliance with the minimum size limit for both recreational and commercial sectors and has adopted the 20 percent spawning potential ratio threshold recommended by the Atlantic States Marine Fisheries Commission.
- A new stock assessment covering the 1991-2013 time period will be presented to the N.C. Marine Fisheries Commission at its May 2015 business meeting.
- This initiative would require an amendment to the N.C. Spotted Seatrout Fishery Management Plan.
- Spotted seatrout would still be part of the N.C. Interjurisdictional Fishery Management Plan if the species specific state plan was retired.
- Any adaptive management strategy designed to manage spotted seatrout based on environmental factors should be part of a state fishery management plan subject to periodic review.

Proposed Initiative: Establish a two season fishing period for large mesh gill nets; one in the spring and the other in late fall to help with cost of the observer program, as well as other obvious savings to the division

Background

- Session Law 2013-360 (Senate Bill 402) provided a one-time appropriation of \$1.1 million to the Observer Program in fiscal year 2014 and increased the commercial license fees by 25 percent to fund the Observer Program moving forward.
- This law also required public hearings for input on additional sources of funding for the Observer Program. The division submitted its plan for additional funding to the Marine Fisheries Commission, and the commission submitted its funding recommendations to the General Assembly.
- Session Law 2014-100 (Senate Bill 744) increased the commercial license fees by an additional 75 percent for a Commercial Fishing Resource Fund (G.S. 113-173.1). The purpose of the fund is to fund the Observer Program and to designate any surplus funds to projects that develop sustainable commercial fishing.
- The Sea Turtle and Atlantic Sturgeon Incidental Take permits require year-round monitoring of the small mesh and large mesh gill net fisheries.
- The Sea Turtle and Atlantic Sturgeon Incidental Take permits require adequate funding to ensure the permit's obligations are met, and the license fee increases for the Commercial Fishing Resource Fund are expected to meet these obligations.

Previous Actions or Considerations

Observer Program

- The Observer Program Funding report submitted to the General Assembly by the Marine Fisheries Commission suggested management options for the estuarine gill net fishery if adequate funding was not available and if no improvements were made to program efficiencies.
 - Only allow the use of unattended large and small mesh anchored gill nets in estuarine waters from Oct. 1 through April 30
 - The open season for anchored gill net fishing would occur when landings and fishing effort are high, and when sea turtle abundance is lower in estuarine waters.
 - The open season would also coincide with existing small mesh gill net attendance rules (attendance not required from late fall to spring in most estuarine waters).
 - Operate the Observer Program without any set open and closed seasons, but close the estuarine gill net fishery when annual funding runs out.
- The financial audit of the Observer Program by the State Auditor's Office conducted in 2014 identified areas where the Observer Program could be enhanced such as improved documentation of missed trips and other activities associated with observer trips, and the division has already taken these steps.
- In addition, the division's Observer Program regularly reviews its procedures to improve efficiency and save money.
 - Recent examples include improvements to the call logs, establishing target numbers of observer trips needed for each management unit (by season) for meeting the required observer coverage, and an increased proportion of positive alternative platform trips.
 - The Estuarine Gill Net Permit established in September 2014 enhanced Observer Program efficiency through improved identification of active participants and improved contact information, which has reduced the time the observers spend acquiring trips.
- The Observer Program would still be required to monitor the small mesh gill net fishery year-round as required in the Sea Turtle and Atlantic Sturgeon Incidental Take permits.

Commercial Large Mesh Gill Net Fishery (gill nets 5 inches stretched mesh and greater)

- Seasonality of large mesh gill net fishery (all data for 2007-2011)

- Seasonal commercial landings:
 - Dec.-Feb.: 7 percent of landings
 - March-May: 27 percent of landings
 - June-Aug.: 21 percent of landings
 - Sept.-Nov.: 45 percent of landings
- Cumulative landings for all months with 10 percent or more of total landings:
 - Albemarle Sound: 73 percent of landings occur March-April and Sept.-Nov.
 - Pamlico Sound: 74 percent of landings occur July-Oct.
 - Pamlico, Pungo, Bay, and Neuse rivers: 52 percent of landings occur March and Sept.-Oct.
 - Core and Bogue Sound, and the North, Newport, and White Oak rivers: 81 percent of landings occur May-June and Aug.-Oct.
 - South of White Oak River to the S.C. line: 62 percent of landings occur March-April and Aug.-Oct.
- Seasonality of species in large mesh gill net landings:
 - Spring: striped bass, American shad, hickory shad, bluefish, red drum
 - Summer: southern flounder
 - Fall: striped bass, red drum, southern flounder, black drum
 - Winter: striped bass

Summary

- Efforts to improve Observer Program efficiency and to save money are already underway and are a continuous process.
- Adaptive management through the incidental take permits provides management flexibility for monitoring the estuarine gill net under budgetary constraints and to avoid exceeding allowable takes of sea turtles and Atlantic sturgeon.
- Observer Program funding established by Session Law 2014-100 (Senate Bill 744) is expected to be sufficient.
- Fisheries vary seasonally and by area making one size fits all seasons difficult to implement.
- Tailoring open seasons for reasons other than stock health is precedent setting.

Proposed Initiative: Investigate implementing an automated, user friendly & mutually beneficial observer "call-in" system for the gill-net fishery. Fishermen should be required to "call-in" if they are going to "fish" each week. The automated system should issue "confirmation numbers" to commercial fishermen who "call-in." Fishermen who fail to "call in" and report intended fishing activities should lose their permit indefinitely. Violators should be punished on a more severe, graduating scale. Furthermore, fishermen who hold a gill-net permit should be required to sign an agreement with their annual license renewal paperwork, which clearly explains the call-in process including the appropriate phone numbers.

Background

- The Estuarine Gill Net Permit was established on Sept. 1, 2014 to meet the incidental take permits' requirement to identify the participants in the estuarine gill net fishery using anchored gill nets.
 - The Estuarine Gill Net Permit was also designed to improve the efficiency of the Observer Program (ex. accurate contact information for the fishermen), to improve fishermen compliance with the incidental take permits, and create a clear definition and outcome for refusing observer trips.
- During the development of the Estuarine Gill Net Permit, some industry members requested the division implement a call-in system similar to what is used in other federal observer programs.
 - Fishermen would be required to contact the division when they intended to fish estuarine anchored gill nets.
 - Some industry members believe a call-in system would be more effective than the system the division currently employs for the Estuarine Gill Net Permit.
 - Some industry members also believe the division already has the resources to implement a call-in system using various resources such as Marine Patrol Communications staff.
- Division was not prepared to implement a call-in system on such short notice but advised industry members that staff would research other call-in systems to understand the cost and infrastructure required.
- In response to industry's request, staff has begun researching other observer program call-in systems.
 - Staff can provide more information once research on this topic is complete.

Previous Actions or Considerations

Systems used by other observer programs:

- The Atlantic sea scallop fishery has an industry-funded observer program with a pre-trip notification (automated call-in) system.
 - Scallop vessel operators must call in to an automated call-in system no later than three days and no sooner than 10 days prior to sailing.
 - A confirmation number is received after calling in.
 - National Marine Fisheries Service sends an email within 24 hours to either issue a waiver (if no observers are available) or assign an observer to that trip.
 - The vessel operator must provide 48 hours notice to the observer provider prior to leaving the dock.
- The Northeast Federal Observer Program uses a web based pre-trip notification system with an optional call in system.
 - Fishermen login to the system with their permit number and personal identification number.

- Information entered includes departure time and date, trip duration, port of departure, gear type and fishing type.
- A pre-trip notification system for the estuarine gill net fishery would require fishermen to anticipate when and where they will be fishing in order to stay in compliance.
 - This system would decrease the flexibility gill net fishermen currently have for making fishing decisions.

Considerations for a call-in system

- Number of participants
 - Atlantic sea scallop fishery has less than 400 participants (Limited Entry and Limited Entry General Category permit vessels combined).
 - Fisheries observed by the Northeast Fisheries Observer Program that are subject to the web based pre-trip notification system (ex. squid, Atlantic mackerel, butterfish fishery, Atlantic herring fishery, Northeast groundfish fishery) are also limited entry fisheries with relatively small numbers of participants.
 - Over 50 percent of the fishermen used the web based pre-trip notification making the number of phone calls even less for this fishery.
 - In contrast, over 2,300 Estuarine Gill Net Permits were issued for the estuarine anchored gill net fishery with over 80 percent of these issued to commercial fishermen.
 - Previous analysis by License and Statistics staff determined there are approximately 800 to 1,000 active commercial participants in the estuarine anchored gill net fishery.
- Fishing Effort (numbers of trips)
 - Atlantic sea scallop fishery is limited by day at-sea allocations to permitted vessels.
 - Fishing trips for Atlantic sea scallops and the fisheries subject to the web based pre-trip notification system tend to be multiple days in duration and therefore, fewer trips are made than in fisheries where “day trips” are more common (ex. N.C.’s estuarine gill net fishery).
 - In 2013, over 14,000 commercial anchored large mesh gill net trips and nearly 9,000 small mesh anchored gill net trips occurred in N.C. estuarine waters.
 - Based on 2013 N.C. gill net trips, nearly 1,600 observer trips for large and small mesh gill nets combined would be necessary to meet the target observer coverage for these gears (2 percent for small mesh and 10 percent for large mesh).
- Infrastructure
 - Marine Patrol Communications is unable to handle the volume of phone calls for a call-in system for the N.C. estuarine anchored gill net fishery, even if only a small fraction of Estuarine Gill Net Permit holders are actively fishing.
 - The Protected Resources section would need to hire staff to handle phone calls, which would draw resources (money) away from conducting at-sea observer trips.
 - A web based or automated call-in system would likely require dedicated staff to administer but would not rely on staff to answer the phone (or receive a message left by the fisherman) to collect the information.
 - However, an automated call-in system or a web-based system might be more than the division can afford and more than industry is willing to fund through license fees.
 - In addition, staff would need to consult with Information Technology support staff to ensure any system used is compatible with the existing network, computer infrastructures, and databases.
- Compliance
 - After fishermen call in to notify staff that they plan to fish, observers still need to contact the fisherman to arrange a trip, which they already do.
 - Under this system, a fisherman who fishes without notifying the division would be in violation.
 - The proposed initiative states “Fishermen who fail to “call in” and report intended fishing activities should lose their permit indefinitely,” but the rule authority for permits (15A

03O .0506) does not allow the division to revoke a permit indefinitely, rather it has graduated suspension structure of 10 days, 30 days and six months.

- In contrast Rule15A 03O .0114 bases license suspensions and revocations on the number of convictions and the severity of the conviction with a graduated suspension structure of 30 days, 60 days, and one year.
- Marine Patrol and Protected Resources sections would need to monitor fishing activity (ex. on-the-water checks, checking trip tickets at the fish house, etc.) for compliance, which draws staff away from other responsibilities such as ensuring proper observer coverage for the gill net fisheries to stay in compliance with the incidental take permits.

Summary

- The division is agreeable to continue investigating this option.
- System currently in place for the Estuarine Gill Net Permit since Sept. 1, 2014, so it is still relatively new and future modifications are likely.
- Pre-trip notification systems for other observer programs are for fisheries with fewer participants taking fewer trips.
- More research by staff is needed to determine if these systems are affordable and if they are compatible with existing network and computer infrastructures.
- Compliance issues would still exist and more compliance monitoring by the division would be necessary.
- A call in system will require more forethought on the part of permit holders if they have to call in a week ahead of time.
- Permit holders will lose some flexibility.

Director's Report



SURVEY OF COMMERCIAL FISHING LICENSE HOLDERS FOR PERSONAL CONSUMPTION OF SEAFOOD CAUGHT WITH COMMERCIAL GEAR

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TABLE OF CONTENTS

ACKNOWLEDGEMENTS	ii
INTRODUCTION	1
METHODOLOGY	1
RESULTS	2
Comparing Respondents With and Without Recorded Commercial Landings	5
DISCUSSION.....	8
APPENDIX 1: Survey instrument.....	10

LIST OF TABLES

Table 1. Answers from survey respondents. (N=657).....	4
Table 2. Answers from survey respondents that had recorded commercial seafood landings in 2014. (N=262)	6
Table 3. Answers from survey respondents that did not have recorded commercial seafood landings in 2014. (N=395)	7

INTRODUCTION

Commercial harvest is currently recorded via the North Carolina Division of Marine Fisheries (NCDMF) Trip Ticket Program. Under record keeping requirements outlined in G.S. 113-168.2 (h), all seafood landed and sold in North Carolina must be recorded on a trip ticket by a licensed seafood dealer. Fish or shellfish caught by commercial gear or in commercial quantities by a commercial fishing license holder can be kept for personal consumption or donation but do not fall under the trip ticket reporting requirements. As such, this harvest can go un-recorded and there are no sampling protocols in place, making the extent and make-up of this harvest unknown. At times, this unknown harvest has come to the forefront of discussion at the Marine Fisheries Commission with recent issues over defining a commercial fisherman, unsold target species when harvesting red drum as a bycatch species, and oyster harvest in the southern region of the state.

In response, the NCDMF carried out a mail-based pilot survey of commercial fishing license holders in early 2015 as part of an effort to gather information on fish and shellfish that are landed with commercial fishing gear or harvested in commercial quantities, but kept for personal consumption or donation. Being a pilot survey to gauge if more effort is needed to investigate the extent of unsold catch, the survey was designed to be brief and low cost. The survey contained five questions on fishing behavior as well as the final disposition (sold or not sold) of fish and shellfish harvested with commercial gear or in commercial quantities.

METHODOLOGY

In December 2014, a list of 7,903 North Carolina commercial fishing license holders was obtained from the NCDMF license database for individuals that owned a commercial fishing license in fiscal year 2014. The list included all individuals that owned a Standard Commercial Fishing License (SCFL), Retired Standard Commercial Fishing License (RSCFL), or a commercial Shellfish License for North Carolina Residents. No distinction was made as to license holders' landings, license type, or entity type (person or business). Each license holder in the database has a personal identification number (PID) which was used to track individuals' commercial license types, landings, and survey responses. Additionally, each individual was assigned a survey number ranging from 1 to 7,903. This number was used to select participants for each mailing of the survey.

There were two separate mailings of the survey in early January 2015 and in early February 2015. For each mailing, 1,000 individuals were randomly chosen from the described database according to their assigned study number. Each license holder was mailed a copy of the survey on a pre-paid postage card along with a letter introducing and describing the survey. For the purpose of this survey, commercial gears listed were crab pot, gig, trawl, gillnet, rod and reel, by hand/rake/tong, and other. A copy the survey instrument can be found in Appendix 1. A database was created encompassing survey responses combined with NCDMF license and Trip Ticket Program information detailing individuals' licenses types, number of licenses, and landings, where applicable, by both shellfish and finfish.

RESULTS

Respondents were asked to answer a series of five general questions regarding their main reason for owning a commercial fishing license, whether they fished with commercial gears or harvested commercial quantities of shellfish or finfish in 2014, what kind of gears were used, typical use of catch, and estimated harvest of seafood caught by commercial gears but kept for personal consumption or donation. Some respondents did not answer all questions on the survey, so responses do not add up to the total surveyed population. Conversely, respondents often provided multiple answers to a single question; therefore percentages may be above 100% in a respective question if they were to be summed.

Out of the 2,000 surveys that were mailed, the division received 657 responses, making for an overall response rate of 33%. There were 55 additional surveys returned due to invalid mailing addresses. Of the respondents, 262 (40%) had recorded landings on trip tickets in 2014 and 395 (60%) did not have any recorded commercial landings. These license holders held 477 SCFLs, 164 RSCFLs, and 75 commercial shellfish licenses. There were 49 respondents that owned more than one commercial license and nine respondents owned more than one type of commercial license.

Responses to the survey questions were tabulated and summarized (Table 1). The first question inquired about a license holder's main purpose for owning a commercial license. This question did not have pre-selected answers, leading to a wide variety of responses. An effort was made to characterize responses into five separate categories, with a sixth category of "other". Most respondents (93%) provided answers to this question, with many respondents providing answers that fell into multiple categories. Not surprisingly, the most common purpose of owning a commercial fishing license was related to current or past income (57%). Additionally 13% of respondents indicated owning a commercial license for future income prospects. This often included either a backup income should loss of current employment occur or for supplemental income after retirement. The second most common response included some sort of personal consumption or donation aspect (28%). While some respondents listed personal consumption or donation as the main reason for owning a commercial license, this response was often associated with an income reason as well. A few responses indicated that a commercial license allowed sale of excess catch (2%), which was often associated with the ability to help cover trip expenses. Some responses also indicated that the commercial license allowed license holders to fish under commercial requirements or in commercial quantities instead of recreational. This response was often associated with harvesting above recreational shellfish or finfish limits, utilizing more than 100 yards of gill net, or not being required to adhere to some attendance requirements. Finally, many responses (13%) did not fall into any of the previous categories and were listed as "other".

The majority of respondents indicated that they had fished with commercial gear in 2014 (60%). The most commonly cited commercial gear used was gill net (53%), followed by hand/rake/tong (34%), crab pot (34%), rod and reel (32%), trawl (23%), gig (21%), and "other" (13%). "Other" gears included dredge, fish pot, pound net, channel net, trotline, longline, cast net, greenstick, long haul, peeler pot, spear, bandit rig, and hoop net. Approximately two thirds of respondents provided information on what they typically did with their harvest when using commercial gears or harvesting in commercial quantities. The most common response was to sell part of the catch and keep the other portion for personal consumption or donation (45%). This was closely followed by "sell all of catch" (44%) and "do not sell catch" (20%).

Overall, 342 respondents did not indicate having unsold seafood caught with commercial gear. There were 315 respondents that provided an estimate of unsold catch. The most commonly cited category was finfish (79%) followed by bushels of shellfish (46%), crabs (35%), shrimp (34%), and numbers of shellfish (7%). The corresponding number of responses, average, median and, where appropriate, mode values for each category can be seen in Table 1. The presence of some relatively high estimates of harvest skewed summarized data upwards. This is reflected in standard deviations that are larger than the average and average values that tend to be much larger than corresponding median values. As such, median values may be a better descriptive statistic to more accurately represent the central tendencies of responses for this question.

Table 1. Answers from survey respondents. (N=657)

Q1: Main purpose for owning a commercial fishing license		Responses	% of Total Response			
Current or Past Income		348	57%			
Future Income		80	13%			
Personal Consumption or Donation		170	28%			
Sell Excess Catch		10	2%			
Fish Under Commercial Requirements Instead of Recreational		20	3%			
Other		79	13%			
<i>Total Responses</i>		608	-			
<i>No Response</i>		49	-			
Q2: Used commercial gear or harvested in commercial quantities		Responses	% of Total Response			
Yes		383	60%			
No		266	40%			
<i>Total Responses</i>		649	-			
<i>No Response</i>		8	-			
Q3: Commercial Gears Used		Responses	% of Total Response			
Crab Pot		145	34%			
Gig		91	21%			
Trawl		98	23%			
Gill Net		227	53%			
Rod and Reel		136	32%			
By Hand/Rake/Tong		147	34%			
Other		55	13%			
<i>Total Responses</i>		428	-			
<i>No Response</i>		229	-			
Q4: Typical use of catch		Responses	% of Total Response			
Sell all of catch		180	44%			
Sell part and keep other portion for personal consumption or donation		187	45%			
Do not sell catch		81	20%			
<i>Total Responses</i>		412	-			
<i>No Response</i>		245	-			
Q5: Estimated harvest kept but not sold	Responses	% of Total Responses	Average	Std. Dev.	Median	Mode
Finfish (pounds)	249	79%	217.1	454.8	100	100
Shellfish (bushels)	144	46%	11.4	19.8	5	10
Shellfish (numbers)	22	7%	512	840.9	300	100
Crabs (bushels)	111	35%	12.6	32	3	1
Shrimp (pounds)	108	34%	166.3	253.2	100	50
<i>Total Responses</i>	315	-	-	-	-	-
<i>No Positive Response</i>	342	-	-	-	-	-

Comparing Respondents With and Without Recorded Commercial Landings

Results of the survey responses were further distinguished by those that had recorded sales of seafood via trip tickets in 2014 (Table 2) and those that had no recorded commercial seafood landings (Table 3). Those that did record sales of seafood had average commercial landings of 13,627 pounds of shellfish, 12,857 pounds of finfish, and 26,485 total pounds of seafood in 2014. Median values for each category were much lower, at 254 pounds of shellfish, 412 pounds of finfish, and 2,354 total pounds of seafood. Shellfish landings included crabs and shrimp; however individual shellfish species were further broken out in the survey.

Not surprisingly, the respondents that had recorded landings of seafood often indicated that they held a commercial license for current or past income purposes (91%). Less common were responses that fell into the personal consumption or donation category (17%) followed by “other” (8%), future income (4%), sell excess catch (1%), and ability to fish under commercial requirements instead of recreational (<1%). In contrast, the license holders that had no recorded seafood sales most commonly indicated a personal consumption or donation response (36%). Current or past income (32%) was a common response as well for this group, with future income (20%) also often appearing. There were some respondents in this category that mentioned not being able to fish commercially in the past year due to health issues, but had previously relied on commercial fishing for income. Responses that fell into “other” (16%), fishing under commercial requirements instead of recreational (5%), and selling excess catch (2%) were less common.

The vast majority of survey participants that had recorded commercial landings of seafood in 2014 indicated using commercial gear (90%) to do so. In contrast, the majority of those that did not have recorded commercial landings in 2014 indicated not using major commercial gears to harvest fish or shellfish in commercial quantities (62%). The most commonly used commercial gears for both groups were gill nets (55% for those reporting landings, 50% for those not reporting landings). For those reporting commercial landings, this was followed by crab pot (35%), by hand/rake/tong (31%), rod and reel (26%), trawl (26%), “other” (19%), and gig (18%). For those without commercial landings, gill nets were followed by rod and reel (39%), hand/rake/tong (39%), crab pot (32%), gig (25%), trawl (19%), and “other” (4%).

The majority of respondents that recorded sales of seafood in 2014 typically sold all of their catch (63%), with fewer selling part of their catch and keeping the other part for donation or personal consumption (43%). Few respondents in this category did not typically sell any of their catch (3%). The responses for those that did not record sales of seafood in 2014 were somewhat similar for selling part of their catch and keeping the other part for donation or personal consumption (49%), but more respondents did not typically sell their catch when fishing with commercial gear (43%) and few typically sold all of their catch (18%).

The average quantities of unsold catch were lower in all categories for survey respondents that recorded commercial sales of seafood. Median quantities were lower for these respondents as well for finfish bushels of shellfish and crabs. The median quantities were the same for shrimp, and higher for numbers of shellfish. The most commonly indicated quantity of unsold harvest for respondents that had recorded commercial landings was 50 pounds of finfish, 2 bushels of shellfish, 1,000 individual shellfish, 1 bushel of crabs and 100 pounds of shrimp. In contrast, the most commonly cited quantity of unsold catch for license holders that did not record commercial landings of seafood was 100 pounds of finfish, 10 bushels of shellfish, 100 shellfish, 2 bushels of crabs, and 50 pounds of shrimp.

Table 2. Answers from survey respondents that had recorded commercial seafood landings in 2014. (N=262)

Q1: Main purpose for owning a commercial fishing license		Responses	% of Total Response			
Current or Past Income		234	91%			
Future Income		9	4%			
Personal Consumption or Donation		43	17%			
Sell Excess Catch		2	1%			
Fish Under Commercial Requirements Instead of Recreational		1	<1%			
Other		21	8%			
<i>Total Responses</i>		256	-			
<i>No Response</i>		6	-			
Q2: Used commercial gear or harvested in commercial quantities		Responses	% of Total Response			
Yes		236	90%			
No		25	10%			
<i>Total Responses</i>		261	-			
<i>No Response</i>		1	-			
Q3: Commercial Gears Used		Responses	% of Total Response			
Crab Pot		86	35%			
Gig		44	18%			
Trawl		62	26%			
Gill Net		134	55%			
Rod and Reel		63	26%			
By Hand/Rake/Tong		75	31%			
Other		47	19%			
<i>Total Responses</i>		243	-			
<i>No Response</i>		19	-			
Q4: Typical use of catch		Responses	% of Total Response			
Sell all of catch		149	63%			
Sell part and keep other part for personal consumption or donation		102	43%			
Do not sell catch		7	3%			
<i>Total Responses</i>		238	-			
<i>No Response</i>		24	-			
Q5: Estimated harvest kept but not sold	Responses	% of Total Responses	Average	Std. Dev.	Median	Mode
Finfish (pounds)	128	75%	139.2	250.8	50	50
Shellfish (bushels)	75	44%	10.1	22.5	4	2
Shellfish (numbers)	15	9%	404	361.6	300	1,000
Crabs (bushels)	70	41%	8.1	19.9	2	1
Shrimp (pounds)	64	38%	149.7	200.8	100	100
<i>Total Responses</i>	170	-	-	-	-	-
<i>No Positive Response</i>	92	-	-	-	-	-

Table 3. Answers from survey respondents that did not have recorded commercial seafood landings in 2014. (N=395)

Q1: Main purpose for owning a commercial fishing license		Responses	% of Total Response				
Current or Past Income		114	32%				
Future Income		71	20%				
Personal Consumption or Donation		127	36%				
Sell Excess Catch		8	2%				
Fish Under Commercial Requirements Instead of Recreational		19	5%				
Other		58	16%				
<i>Total Responses</i>		352	-				
<i>No Response</i>		43	-				
Q2: Used commercial gear or harvested in commercial quantities		Responses	% of Total Response				
Yes		147	38%				
No		241	62%				
<i>Total Responses</i>		388	-				
<i>No Response</i>		7	-				
Q3: Commercial Gears Used		Responses	% of Total Response				
Crab Pot		59	32%				
Gig		47	25%				
Trawl		36	19%				
Gill Net		93	50%				
Rod and Reel		73	39%				
By Hand/Rake/Tong		72	39%				
Other		8	4%				
<i>Total Responses</i>		185	-				
<i>No Response</i>		210	-				
Q4: Typical use of catch		Responses	% of Total Response				
Sell all of catch		31	18%				
Sell part and keep other part for personal consumption or donation		85	49%				
Do not sell catch		74	43%				
<i>Total Responses</i>		174	-				
<i>No Response</i>		221	-				
Q5: Estimated harvest kept but not sold		Responses	% of Total Responses	Average	Std. Dev.	Median	Mode
Finfish (pounds)		121	83%	299.5	598.6	100	100
Shellfish (bushels)		69	48%	12.8	16.4	10	10
Shellfish (numbers)		7	5%	742.9	1,441.8	150	100
Crabs (bushels)		41	28%	20.5	45.1	5	2
Shrimp (pounds)		44	30%	190.5	315.3	100	50
<i>Total Responses</i>		145	-	-	-	-	-
<i>No Positive Response</i>		250	-	-	-	-	-

DISCUSSION

The results of this survey provide information from commercial fishing license holders that is often not collected on trip tickets or in other sampling programs. Results indicate some interesting differences between commercial fishing license holders that did and did not report commercial landings of seafood. The sample size of this survey is statistically valid to represent the total population of commercial fishing license holders in 2014 at a 95 percent confidence level and a ± 5 percent sampling error. This survey was randomly administered and the percent of respondents that had commercial landings (40%) in 2014 compared to those that did not (60%) matches up well with the ratio of total licenses with selling privileges used (42%) with those that were not used (58%) in fiscal year 2014.

Nevertheless, there are some causes for concern in the study's application and computation of results. Due to the "pilot nature" and limited budget for this survey, there were no efforts to follow up with license holders selected to participate in the survey. This could have led to some level of non-response bias among the surveyed population. Also, there may have been some response bias where survey participants may have purposely inflated or deflated estimates of harvest or provided inaccurate responses due to apprehension over how study results may be used. Additionally, there was likely recall bias involved in the provided harvest estimates, as participants were asked to estimate 12 months of fishing activity. Some participants likely were not able to accurately remember all harvest due to the time lapse between being questioned and when the harvest took place.

Only positive values were used in computing the unsold harvest estimates, as there was extreme inconsistency in how the survey was filled out. Respondents often did not include any values (leaving spaces blank) despite indicating keeping some catch for personal consumption or donation or indicated that they could not quantify their unsold harvest. Another common issue was that respondents filled out some categories but left others completely blank. This made it unclear if the question was skipped, if they could not quantify harvest, or if they did not have unsold harvest in that category. In future efforts, the estimated harvest component of the survey could be improved if respondents were asked to state whether or not they had harvest in each category, specific species kept, and the common uses of unsold harvest such as donation to others, consumed personally or within the respondent's family, or used for other purposes such as bait.

Caution should be used when applying the results of this survey to the licensed population. Results can be used in a more qualitative manner, such as typical reasons for owning a commercial license, common gears utilized, general use of seafood harvested with commercial gear and the make-up of unsold harvest (e.g. certain groups of species are likely kept more for personal consumption or donation than others). Quantitative application of survey results to estimate total unsold harvest should be met with less confidence, as there are several causes for concern with the survey, as previously described.

Despite the inability of this survey to quantify the amount of unsold harvest, the results do highlight some potential issues with the use of the commercial fishing license outside of the intended purpose of selling seafood for income. The license is often held for income purposes (current and future), especially by those that report sales of seafood. Nevertheless, the license is also used for unintended purposes in some circumstances, such as for personal consumption or circumventing certain regulations or bag limits. The unsold harvest is thought to be largely unreported via the trip ticket program and is not captured by the Marine Recreational Information Program or other NCDMF harvest sampling programs. These issues have come to

the forefront of discussion by the North Carolina Marine Fisheries Commission several times in recent years with concerns over unsold catch when commercially harvesting red drum as a bycatch species, regional impacts of unrecorded harvest on certain species such as oysters, and how to define a commercial fisherman in relation to the large portion of commercial licenses that do not have recorded sales of seafood. Whether or not this unrecorded catch measurably impacts fishery resources and needs to be addressed is debatable and unclear. Should further information be desired and adequate funding made available, efforts could be made to gather additional data and increase confidence in survey results by taking measures to improve the survey instrument and implementing more rigorous sampling methods.

APPENDIX 1: Survey instrument

1) What is your main purpose for owning a commercial fishing license? PID:#####

2) Did you fish with commercial gear or harvest fish/shellfish in commercial quantities in 2014?

- Yes (If "yes" please continue with the survey)
 No (if "no" please disregard the following questions and mail this survey back to NCDMF)

3) Which commercial gear(s) did you use in 2014? (Please check all that apply)

Crab Pot Gig Trawl Gill Net Rod and Reel By Hand/Rake/Tong Other: _____

4) When fishing with commercial gear, what do you usually do with your harvest?

- Sell all of your catch Yes No
- Do not sell any of your catch Yes No
- Sell part of your catch and keep the other portion for personal consumption or for donation Yes No

5) When fishing with commercial gear please estimate how many pounds of the following seafood categories that you kept this year and did not sell?

<u>Category</u>		<u>Please circle correct measure</u>
Finfish (flounder, spot, jumping mullet, etc.)	_____	pounds
Shellfish (oysters, clams, bay scallops, etc.)	_____	bushels / numbers
Crabs	_____	bushels
Shrimp	_____	pounds

Thank you for participating in this survey! Please drop this survey card in the most convenient U.S. Postal Service mailbox for return to NCDMF. (Please note that no postage is necessary)



ASMFC

FISHERIES *focus*

Vision: Sustainably Managing Atlantic Coastal Fisheries

INSIDE THIS ISSUE

Upcoming Meetings
page 2

From the Executive Director's Desk
ASMFC and ACCSP Join Forces with NOAA Fisheries to Bolster Recreational Fishing Catch and Effort Data
page 3

Species Profile
Atlantic Menhaden
page 4

Fisheries Management Actions
*Summer Flounder
Atlantic Striped Bass
Winter Flounder*
page 7

Black Drum and Tautog Benchmark Assessments Released
page 10

ASMFC Comings & Goings
page 12

ACCSP Honors Robert Mahood
page 13

On the Legislative Front
page 14

Employee of the Quarter Named
page 15

2014 Annual Report Now Available
page 16

ASMFC Spring Meeting

May 4-7, 2015

The Westin Alexandria
400 Courthouse Square
Alexandria, VA
703.253.8600

Preliminary Agenda

Please note: The agenda is subject to change. Bulleted items represent the anticipated major issues to be discussed or acted upon at the meeting. The final agenda will include additional items and may revise the bulleted items provided below. The agenda reflects the current estimate of time required for scheduled Board meetings. The Commission may adjust this agenda in accordance with the actual duration of Board meetings. Interested parties should anticipate Boards starting earlier or later than indicated herein.

MONDAY, MAY 4

- 12:45 – 2:15 PM **Atlantic Herring Section**
- Review and Consider Approval of Draft Amendment 3 for Public Comment
 - Review and Consider Approval of the 2014 FMP Review and State Compliance Report
- 2:30 – 5 PM **American Lobster Management Board**
- Review and Consider Approval of Draft Addendum XXIV for Public Comment
 - Review and Consider Approval of the Draft Jonah Crab Fishery Management Plan for Public Comment
 - Review and Consider Approval of Nominations to the Jonah Crab Advisory Panel

TUESDAY, MAY 5

- 8 – 11 AM **Atlantic Menhaden Management Board**
- Review Technical Committee Report on Biological Reference Points and Stock Projections
 - Consider Approval of 2015 Fishery Specifications
 - Discuss Next Steps for Management Based on Results of the Benchmark Assessment/ERP Term of Reference and the Technical Committee Report
- 11:15 AM - Noon **South Atlantic State/Federal Fisheries Management Board**
- Review NOAA Fisheries Southeast Regional Office Draft Strategic Plan for 2016-2020

continued, see SPRING MEETING AGENDA on page 6

Upcoming Meetings

The Atlantic States Marine Fisheries Commission was formed by the 15 Atlantic coastal states in 1942 for the promotion and protection of coastal fishery resources. The Commission serves as the deliberative body of the Atlantic coastal states, coordinating the conservation and management of nearshore fishery resources, including marine, shell and diadromous species. The fifteen member states of the Commission are: Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, and Florida.

Atlantic States Marine Fisheries Commission

Dr. Louis B. Daniel, III (NC)
Chair

Douglas E. Grout (NH)
Vice-Chair

Robert E. Beal
Executive Director

Patrick A. Campfield
Science Director

Toni Kerns
ISFMP Director

Laura C. Leach
Director of Finance & Administration

Tina L. Berger, Editor
Director of Communications
tberger@asmfc.org

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April 10 (9:30 AM - Noon)

ASMFC Atlantic Menhaden Advisory Panel Conference Call.

April 14 - 16

Mid-Atlantic Fishery Management Council, Ocean Place Resort, 1 Ocean Boulevard, Long Branch, NJ.

April 20 & 21

Atlantic Coastal Fish Habitat Partnership Steering Committee, Hyatt Regency, Pier 66, 2301 SE 17th Street, Fort Lauderdale, FL.

April 21 - 23

New England Fishery Management Council, Hilton Hotel, Mystic, CT.

April 22 & 23

ASMFC Habitat Committee, Hyatt Regency, Pier 66, 2301 SE 17th Street, Fort Lauderdale, FL.

May 4 - 7

ASMFC Spring Meeting, The Westin Alexandria, 400 Courthouse Square, Alexandria, VA.

June 2

Bluefish Stock Assessment Review Workshop, NOAA Fisheries Northeast Fisheries Science Center, 166 Water Street, Woods Hole, MA.

June 8 - 12

South Atlantic Fishery Management Council, Doubletree Grand Key Resort, 3990 S. Roosevelt Boulevard, Key West, FL.

June 9 - 11

Mid-Atlantic Fishery Management Council, Doubletree by Hilton, Raleigh Brownstone University, 1707 Hillsborough Street, Raleigh, NC.

June 9 - 12

ASMFC Technical Committee Meeting Week, committees and location to be determined.

June 16 - 18

New England Fishery Management Council, Hotel Viking, Newport, RI.

August 4 - 6

ASMFC Summer Meeting, The Westin Alexandria, 400 Courthouse Square, Alexandria, VA.

August 11 - 13

Mid-Atlantic Fishery Management Council, Holiday Inn Midtown, 440 West 57th Street, New York City, NY.

September 14 - 18

South Atlantic Fishery Management Council, The Beach House Resort, 1 South Forest Beach Drive, Hilton Head Island, SC.

September 14 - 18

ASMFC Technical Committee Meeting Week, committees and location to be determined.

September 29 - October 1

New England Fishery Management Council, Radisson Hotel, Plymouth Harbor, Plymouth, MA.

October 6 - 8

Mid-Atlantic Fishery Management Council, Doubletree Philadelphia Center City 237 S Broad St Philadelphia, PA.

November 2 - 5

ASMFC 74th Annual Meeting & Joint Meeting with the GSMFC, St. Augustine, FL.



ASMFC and ACCSP Join Forces with NOAA Fisheries to Bolster Recreational Fishing Catch and Effort Data

Producing a reliable estimate of recreational anglers' catch and effort has proven to be one of the most difficult tasks facing fishery managers in modern times. Unlike commercial fisheries, with trip level reporting, dealer reporting, and onboard observers, recreational catch and effort is as complicated and varied as the millions of anglers who fish our marine waters every year.

Recognizing the need for better recreational effort data, NOAA Fisheries commissioned an independent review of its recreational fishing survey in 2006 through the National Research Council (NRC). One year later, Congress required NOAA to implement the study's recommendations, including

the creation of a national saltwater angler registry. While the resulting Marine Recreational Information Program (MRIP) was a vast improvement over previous estimates, there is still work to do to further improve the program and the data it provides. Two recent developments have the potential to significantly improve the accuracy of, and stakeholder confidence in, recreational fishing effort and landings estimates. The first development involves the Atlantic states taking over conduct of the catch estimate portion of MRIP known as the Access Point Angler Intercept Survey (APAIS).

APAIS is one of the most crucial components of estimating recreational catch and discards. It requires person to person interaction on docks and other fishing sites to identify catch and effort of recreational anglers. The Atlantic coast remains the only area in

the continental U.S. where the APAIS angler interviews are still conducted by MRIP's contractors. Shifting APAIS to the states in the Gulf of Mexico has resulted in substantial improvements in data quality, a better sense of involvement by the participating states, and more confidence in the results by the interviewed anglers.

Beginning in 2016, all coastal states from Maine through Georgia will transition to conducting APAIS to collect information on marine recreational fishing catch and effort data in their own waters. Over the past decade several states (e.g., Maine, New Hampshire, Massachusetts, North Carolina, South Carolina and Georgia) have successfully improved data quality, and stakeholder confidence in that data, through greater state involvement with APAIS contractors.

Based on these successes, the states, through the Atlantic Coastal Cooperative Statistics Program (ACCSP) and the Commission, approved a plan to transition to state conduct of APAIS in 2016. The plan details the transition from the current NOAA Fisheries contractor to ASMFC/ACCSP and state conduct of the APAIS. Under this plan, NOAA Fisheries will retain primary accountability for APAIS and will be responsible for survey design, catch and effort estimation, and public dissemination. The Commission and ACCSP will act as the central coordinators of the state-conducted APAIS and will be responsible for data entry, compilation, quality control/quality assurance, as well as formatting and delivering intercept data to NOAA Fisheries. States will oversee and manage field collection, which will be conducted by state or Commission employees in accordance with APAIS standard data collection protocols.

NOAA Fisheries is also transitioning parts of the effort survey it administers from a landline phone survey to mail survey. In the past, MRIP has estimated effort through the Coastal Household Telephone Survey (CHTS), which randomly targets households with landlines in coastal counties. As you can imagine, this methodology has a number of shortcomings, including declining response rates to household telephone surveys generally and the increasing proportion of households that only use cell phones. Recently completed pilot studies indicate mail surveys are a much better tool for capturing recreational fishing effort by increasing response rates, reaching a broader population of anglers, and improving response accuracy. The pilot studies also found the new survey resulted in considerably higher estimates of fishing effort, which in turn will result in correspondingly higher estimates of catch. What this means is that once the new survey is ready for implementation, which will take two to three years in order to align the new estimates with the historical data series, there could be significant stock assessment and management implications. In order to develop the most appropriate way to transition from historical to improved survey designs, NOAA Fisheries has formed a Transition Team, composed of representatives from the Regional Councils, Interstate Commissions, and state partners, to design an implementation plan for the new mail survey.

In order to assess MRIP's progress in addressing the NRC's 2006 recommendations, the MRIP Executive Steering, of which the Executive Directors of the three Interstate Commissions are members, is recommending a new NRC review be undertaken soon. It is my hope the review will find MRIP's accomplishments, including changes to APAIS conduct and the effort survey, are vast improvements from its predecessor, the Marine Recreational Fisheries Statistics Survey. While these improvements have been a long time in coming, they represent time well spent in ensuring recreational fishing and effort estimates are accurate and best meet the needs of fisheries scientists, managers, and the angling public.

Beginning in 2016, all coastal states from Maine through Georgia will transition to conducting APAIS to collect information on marine recreational fishing catch and effort data in their own waters.

Species Profile: Atlantic Menhaden

Benchmark Stock Assessment Sheds New Light on Stock Condition; Board to Consider Long-term Management Goals

Introduction

Atlantic menhaden (*Brevoortia tyrannus*) are a small, oily, schooling fish of historical, economic, and ecological importance. Historically, menhaden supported large-scale commercial reduction fisheries bringing considerable growth to Atlantic coastal communities. Today, the reduction fishery is a fraction of what it once was with one processing plant and several vessels operating on the Atlantic coast. The reduction fishery is so named because menhaden are processed (or reduced) into other products, such as agricultural fertilizer, fishmeal and oil, as well as livestock and aquaculture feeds. Additionally, menhaden are becoming increasingly valuable for use as bait in many important fisheries, including American lobster and blue crab commercial fisheries and striped bass recreational fisheries. Ecologically, the species plays an important role in marine ecosystems as a forage fish (prey) for many fish, sea birds, and marine mammals. As such, the Commission places a high priority on developing ecosystem-based reference points for management use in order to account for the forage needs of menhaden's predator species such as striped bass, weakfish, and bluefish. The 2015 benchmark stock assessment, which was recently approved by the Atlantic Menhaden Board for management use, alters our understanding of the status of the stock. As a result, current management measures may be reassessed to more equitably balance human use and ecological factors.

Life History

Atlantic menhaden occupy estuaries and coastal waters from northern Florida to Nova Scotia and are believed to consist of a single population. Adult and juvenile menhaden form large, near-surface schools, primarily in estuaries and nearshore ocean waters from early spring through early winter. By summer, menhaden schools stratify by size and age along the coast, with older and larger menhaden found farther north. During fall-early winter, menhaden of all sizes and ages migrate south around the North Carolina capes to spawn.

Sexual maturity begins as early as age one to just before age three, with major spawning areas from the Carolinas to New Jersey. The majority of spawning occurs primarily offshore (20-30 miles) during winter. Buoyant eggs hatch at sea, and larvae are carried into estuarine nursery areas by ocean currents. Juveniles spend most of their first year in estuaries, migrating to the ocean in late fall.

Menhaden are very efficient filter feeders. Water is pushed through specialized gill rakers that are formed into a basket that allows them to capture plankton. Menhaden are an important component of the food chain, providing a link between primary production and higher organisms by consuming plankton and providing forage for species such as striped bass, bluefish, and weakfish, to name just a few.

Commercial Fishery

The Atlantic menhaden commercial fishery consists of a reduction fishery and a bait fishery. The reduction fishery, named because it processes the whole fish into fish meal, fish oil, and fish solubles, first began in New England during the early 1800s and spread south after the Civil War. The reduction fishery grew with the advent of purse seine after the Civil War in the mid-

Species Snapshot

Atlantic Menhaden
Brevoortia tyrannus



Common Names:

menhaden, bunker, mossbunker, poggy, fatback, bugmouth, skipjack

Species Range:

Atlantic coast of North America from Nova Scotia to northern Florida

Family:

Clupeidae (includes herring, sardine, and shad species)

Interesting Facts:

- The modern record for the largest menhaden landed occurred in Reedville, VA in 1996, measuring in at 19.4" and weighing 3.4 lbs.
- Pre-colonial Native Americans called menhaden 'munawhatteaug,' which means fertilizer.
- A large crustacean parasite is commonly found in the mouth of Atlantic menhaden; hence its common name "bugmouth."
- Adults can filter 6-7 gallons of water/minute.
- Ethel Hall, with NMFS Beaufort Lab, has been ageing Atlantic menhaden for over 40 years using a 1967 Eberbach projector.
- Adults can filter 6-7 gallons of water/minute.

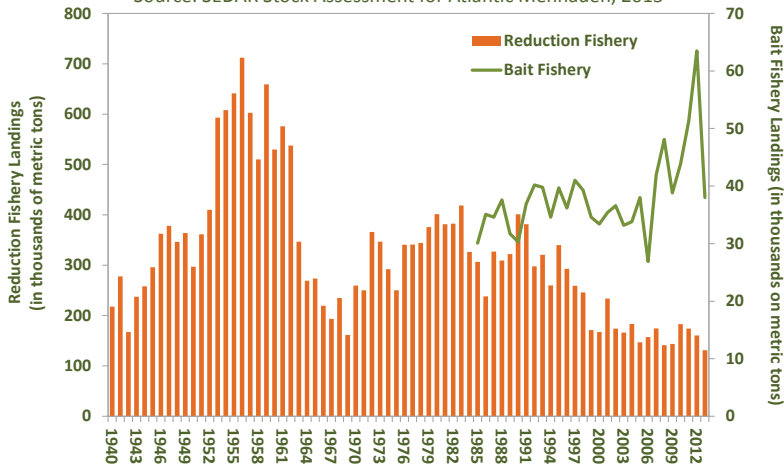
Stock Status: Not overfished and not experiencing overfishing



Photo © John Surrick, Chesapeake Bay Foundation

Atlantic Menhaden Landings by Reduction and Bait Fisheries

Source: SEDAR Stock Assessment for Atlantic Menhaden, 2015



Timeline of Management Actions: FMP ('81); FMP Revision ('91); Amendment 1 ('01); Addendum I ('04); Addendum II ('05); Addendum III ('06); Addendum IV (2'09); Addendum V ('11); Amendment 2 ('12); Addendum I ('13)

southern Maine. In the 1960s, the Atlantic menhaden stock contracted geographically, and many of the fish factories north of the Chesapeake Bay closed because of a scarcity of fish. Reduction landings dropped to a low of 161,000 mt in 1969. In the 1970s and 1980s, the menhaden population began to expand (primarily due to a series of above average year classes entering the fishery), and reduction landings rose to around 300,000-400,000 mt. Adult menhaden were again abundant in the northern half of their range and, as a result, reduction factories in New England and Canada began processing menhaden again by the mid-1970s. However, by 1989 all shore-side reduction plants in New England had closed, mainly because of odor abatement regulations.

During the 1990s, the Atlantic menhaden stock contracted again (as in the 1960s), largely due to a series of poor to average year classes. Over the next decade, several reduction plants consolidated or closed, resulting in a significant reduction in fleet size and fishing capacity. By 2005, there was only one remaining reduction plant in operation on the Atlantic coast processing menhaden into fishmeal and oil, which is located in Virginia and still operational today.

Beginning in 2013, as required under Amendment 2 to the Interstate Fishery Management Plan for Atlantic Menhaden (Amendment 2) and in response to the results of the 2010 benchmark stock assessment, total harvest levels of menhaden were reduced by at least 20% from the average of 2009-2011 landings. The 2013 reduction fishery harvest was 131,034 mt, an 18% decrease from harvest in 2012 (160,627 mt) and 24% below average landings from 2010-2012 (172,600 mt). Seven purse-seine vessels landed Atlantic menhaden during the 2013 season. Most of the catch occurred in the waters off of Virginia and New Jersey.

The coastwide bait fishery supplies fishermen with bait for popular commercial (e.g., American lobster and blue crab) and sport fish (e.g.,

continued, see ATLANTIC MENHADEN on page 8

1800s. Purse seine landings reached a high point in the 1950s with peak landings of 712,100 metric tons (mt) in 1956. At that time, over 20 menhaden reduction factories ranged from northern Florida to



Atlantic Menhaden Assessment Q&A

What Data Were Used?

The Atlantic menhaden assessment used two types of data. The first was fishery-dependent data, which includes commercial landings and portside samples taken to obtain weight, length, and age distribution information. The second was fishery-independent data, which includes data collected through scientific research and surveys. To develop a coastwide index of juvenile relative abundance, 16 surveys were used from across the states, including seine surveys, trawl surveys, and an electrofishing survey. Nine new indices of state survey data were used to develop two adult abundance indices, and the selectivity of these indices was estimated with length data.

What Models Were Used?

The Beaufort Assessment Model (BAM) was chosen based on model performance, reliability, flexibility, and assumption requirements. The BAM is a statistical catch-at-age model that estimates population size at age and recruitment in 1955 and then projects the population forward in time to 2013. The model estimates trends in population dynamics, including abundance at age, recruitment, spawning stock biomass, egg production, and fishing mortality rates. The BAM was configured to account for differences in selectivity introduced by each of the fishery fleets, a modeling technique called fleets-as-areas.

What is the Status of the Stock?

The assessment results indicate that the Atlantic menhaden stock is not overfished and overfishing is not occurring, relative to the current

continued, see ASSESSMENT Q&A on page 8

2014 Atlantic Menhaden Quotas		
State	2014 Quota (mt)	2014 Quota (lbs)
ME	66.58	146,787
NH	0.05	112
MA	1417.94	3,126,024
RI	30.29	66,779
CT	29.50	65,034
NY	93.76	206,695
NJ	18924.42	41,721,164
DE	22.33	49,230
MD	2320.98	5,116,874
PRFC	1049.69	2,314,174
VA	144272.84	318,066,790
NC	833.23	1,836,948
SC	-	-
GA	-	-
FL	30.39	66,995
TOTAL	169092	372,783,605

Spring Meeting Agenda (continued)

TUESDAY, MAY 5

- 12:15 – 2 PM **Blank Rome Workshop**
- Budget Status
 - Magnuson-Stevens Act Reauthorization
 - Horseshoe Crab Trawl Survey Funding
 - Committee Membership Updates
- 1 – 5 PM **Law Enforcement Committee (LEC)**
- Review Draft Management Measures for Jonah Crab
 - Review 2015 Action Plan Tasks
 - Update LEC Representatives to Species Boards/Appoint Alternates
 - Reports on Outside Law Enforcement Advisory Committee Activities (AFWA/NACLAC/Councils)
- 2:15 – 3:45 PM **Atlantic Striped Bass Management Board**
- Review Technical Committee Report on Progress of the Development of Reference Points for Chesapeake Bay, Hudson River, and Delaware Bay
 - Update on State Implementation of Addendum IV
- 4 – 5:30 PM **NOAA Fisheries Marine Recreational Information Program (MRIP) Update**
- Progress Report on Changes and Improvements to MRIP
- 6 – 8 PM **Annual Awards of Excellence Reception**

WEDNESDAY, MAY 6

- 8 – 10 AM **Executive Committee**
- Review Suggested Changes to Commission Guidance Documents
 - Update on Staffing
 - Presentation of FY16 Budget
 - Review Revised on Language on Appeal Criteria
 - Update on 2015 Annual Meeting
- 8:30 AM – Noon **Law Enforcement Committee (continued)**
- 10AM – 12:30 PM **Interstate Fisheries Management Program (ISFMP) Policy Board**
- Update from Executive Committee
 - Review and Discuss 2014 Commissioner Survey Results
 - Review and Approve Stock Status Definition Revisions
 - Review and Discuss the Northeast Regional Ocean Council Spatial Characterization of Commercial Fisheries
 - Committee on Economics and Social Sciences Report
 - Assessment and Science Committee Report
 - Law Enforcement Committee Report
- 12:45 – 2:15 PM **Atlantic Coastal Cooperative Statistics Program (ACCSP) Executive Committee**
- ACCSP Status Report (Program and Committee Updates)
 - Independent Program Review Progress
 - APAIS Update
 - Governance Review Update
- 2:30 – 3:30 PM **Shad and River Herring Management Board**
- Review the River Herring Technical Working Group Conservation Plan

continued, see SPRING MEETING AGENDA on page 9

Public Comment Guidelines

With the intent of developing policies in the Commission's procedures for public participation that result in a fair opportunity for public input, the ISFMP Policy Board has approved the following guidelines for use at management board meetings:

For issues that are not on the agenda, management boards will continue to provide opportunity to the public to bring matters of concern to the board's attention at the start of each board meeting. Board chairs will use a speaker sign-up list in deciding how to allocate the available time on the agenda (typically 10 minutes) to the number of people who want to speak.

For topics that are on the agenda, but have not gone out for public comment, board chairs will provide limited opportunity for comment, taking into account the time allotted on the agenda for the topic. Chairs will have flexibility in deciding how to allocate comment opportunities; this could include hearing one comment in favor and one in opposition until the chair is satisfied further comment will not provide additional insight to the board.

For agenda action items that have already gone out for public comment, it is the Policy Board's intent to end the occasional practice of allowing extensive and lengthy public comments. Currently, board chairs have the discretion to decide what public comment to allow in these circumstances.

In addition, the following timeline has been established for the submission of written comment for issues for which the Commission has NOT established a specific public comment period (i.e., in response to proposed management action).

1. Comments received 3 weeks prior to the start of a meeting week will be included with the main meeting materials.
2. Comments received by 5 PM on the Tuesday immediately preceding the scheduled ASMFC Meeting (in this case, the Tuesday deadline will be **April 28, 2015**) will be distributed electronically to Commissioners/Board members prior to the meeting and a limited number of copies will be provided at the meeting.
3. Following the Tuesday, April 28, 2015 5 PM deadline, the commenter will be responsible for distributing the information to the management board prior to the board meeting or providing enough copies for the management board consideration at the meeting (a minimum of 50 copies).

The submitted comments must clearly indicate the commenter's expectation from the ASMFC staff regarding distribution. As with other public comment, it will be accepted via mail, fax, and email.

Summer Flounder Recreational Regional Management Maintained for 2015; State Plans Approved for 2015 Recreational Black Sea Bass & Scup Fisheries

The Summer Flounder, Scup and Black Sea Bass Management Board approved Addendum XXVI to the Summer Flounder and Black Sea Bass Fishery Management Plan, continuing adaptive regional management for the 2015 recreational summer flounder fisheries. The approved regions are Massachusetts; Rhode Island; Connecticut through New Jersey; Delaware through Virginia; and North Carolina. The Addendum provides the option for the Board to extend the adaptive regional management approach into 2016 through Board action.

Addendum XXVI was initiated to consider a continuation of regional management approved in Addendum XXV. Both addenda address concern that summer flounder management measures under state-by-state conservation equivalency were not providing recreational fishermen along the coast with equitable harvest opportunities to the resource. The adaptive regional management approach is designed to respond to changes in resource availability and effort in the fishery. The Board decided to continue 2014 management measures for the 2015 fishing season.

For black sea bass, the Board approved the methodologies used by the states of Massachusetts through New Jersey to establish their minimum size, bag limits, and season lengths to achieve a 33% reduction in the 2015 recreational harvest levels from the 2014 harvest level. The 33% reduction is required in order to achieve but not exceed that 2015 recreational harvest limit.

For scup, the Board approved the maintenance of 2014 recreational management measures for the 2015 fishing season, with the exception of Connecticut which will increase its size and possession limit to be consistent with the

other states' private and for-hire fisheries. States will finalize their regulations over the next couple of weeks for the recreational summer flounder, black sea bass, and scup fisheries.

Addendum XXVI is available on the Commission website, www.asmf.org, on the Summer Flounder page. For more information, please contact Kirby Rootes-Murdy, Fishery Management Plan Coordinator, at krootes-murdy@asmfc.org.

Atlantic Striped Bass State Implementation Plans to Reduce Harvest Approved

The Atlantic Striped Bass Management Board approved Addendum IV implementation plans and conservation equivalency proposals for all the states and jurisdictions. The implementation plans, which were reviewed and approved by the Technical Committee, contain state-specific management options that achieve a 25% reduction in harvest from 2013 levels for the coastal fishery and 20.5% reduction in harvest from 2012 levels for the Chesapeake Bay fishery. Given the wide range of options being considered, the Board recommended neighboring states and jurisdictions work together to implement consistent management measures, especially on shared water bodies. This recommendation was also supported by the Commission's Law Enforcement Committee. Additionally, the Board reminded states there is greater certainty in the percent reductions of simple management measures (i.e., changes in bag or size limits) relative to more complex

measures (e.g., slot/trophy fish and mode-specific options).

The Board also tasked the Technical Committee with expanding the exploration of stock-specific reference points to include the other producer areas, such as the Delaware Bay and the Hudson River stocks, in addition to the Chesapeake Bay. The Board will review progress on the stock-specific reference points at its Spring Meeting in May.

States and jurisdictions must have final measures for implementing Addendum IV in place by the beginning of their 2015 fishing seasons. For more information, please contact Mike Waine, Senior Fishery Management Plan Coordinator, at mwaine@asmfc.org.

2015 Specifications Set for the Inshore Stocks of Winter Flounder

The Commission's Winter Flounder Management Board maintained its winter flounder commercial and recreational management measures for the inshore waters of the Gulf of Maine (GOM) and Southern New England/Mid-Atlantic (SNE/MA) for the 2015 fishing season.

The Board maintains its commitment to work with the New England Fishery Management Council and NOAA Fisheries Greater Atlantic Regional Fisheries Office to collaboratively manage winter flounder stocks throughout their range. For more information, please contact Melissa Yuen, Fishery Management Plan Coordinator, at myuen@asmfc.org or 703.842.0740.

Minimum Commercial and Recreational Management Measures for Inshore Winter Flounder Stocks

Stock	Sector	Trip Limit/ Possession Limit	Size Limit	Season	Gear
GOM	Commercial	500 lbs/trip/ day	12"	Maintain Closures	Minimum 6.5" square or diamond mesh in cod-end
	Recreational	8 fish	12"	NA	
SNE/MA	Commercial	50 lbs 38 fish/trip/day	12"	Maintain Closures	Minimum 6.5" square or diamond mesh in cod-end 100-lb mesh trigger
	Recreational	2 fish	12"	March 1 – December 31	

Species Profile (continued)

striped bass and bluefish), and has grown throughout its history along with the expansion of many fisheries that utilize menhaden as bait. Landings for bait have recently dipped due to the aforementioned reduction; levels for 2013 were 35,043 mt, 34% below the average landings during 2010-2012 (52,900 mt). However in 2012, bait landings peaked at an all-time high of 63,540 mt. The bait fishery has increased in relative importance from New England to North Carolina. This is evident in the increasing percent of total menhaden landings that are attributed to the bait fishery. Between 2001 and 2012, the percent of total landings that were used for bait rose from 13% to a high of 28% in 2012. In 2013, bait harvest composed approximately 22% of the total menhaden harvest. In recent years, the majority of bait landings have been harvested from Virginia and New Jersey waters, followed by Massachusetts and Maryland.

Status of the Stock

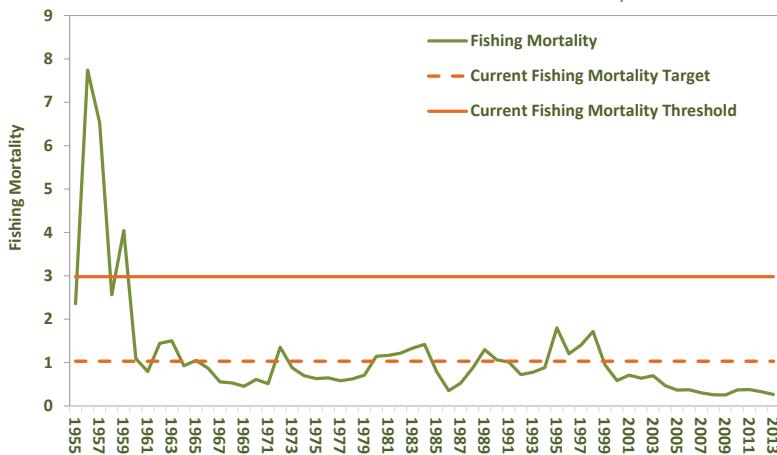
The 2015 benchmark stock assessment indicates that Atlantic menhaden are neither overfished nor experiencing overfishing. Fishing mortality rates have remained below the overfishing threshold (2.98) since the 1960s, and have hovered around the overfishing target (1.03) through the 1990s. In 1999, fishing mortality dropped below the target and was estimated to be 0.27 in 2013 (the latest year in the assessment). In other words, fishing mortality has been decreasing throughout the history of the fishery, and is now 91% below the

threshold and 73% below the target, meaning that overfishing is not occurring.

The biological reference point used to determine the fecundity target is defined as the mature egg production one would expect when the population is being fished at the threshold fishing mortality rate. Population fecundity, a measure of reproductive capacity, was estimated to be well above both the threshold and the target in recent years. In fact, in 2013, fecundity is estimated to have been 71% higher than the target value, which is calculated to be 100

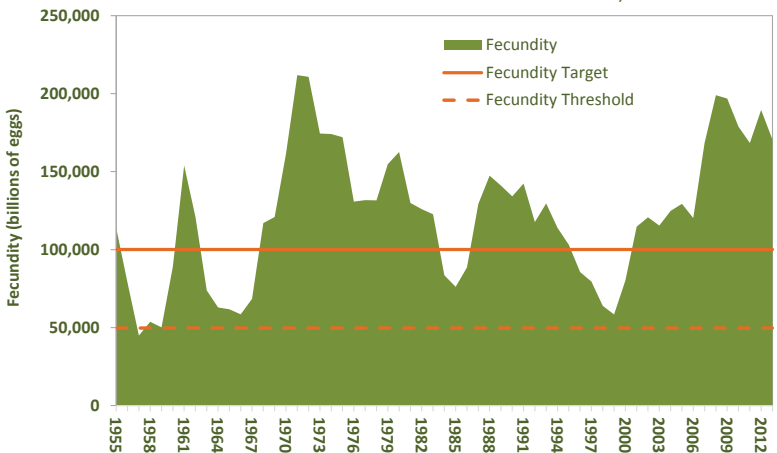
Atlantic Menhaden Fishing Mortality

Source: SEDAR Stock Assessment for Atlantic Menhaden, 2015



Atlantic Menhaden Fecundity

Source: SEDAR Stock Assessment for Atlantic Menhaden, 2015



continued, see ATLANTIC MENHADEN on page 9

ASSESSMENT Q&A continued from page 5

biological reference points based on maximum spawning potential.

Why Are These Findings Different from Those of the 2010 Benchmark Assessment?

Through the consideration of new and existing datasets and the exploration of alternative model configurations, significant changes were made during the 2015 assessment to address the issues identified with the 2010 assessment. These include:

- Maturity at age was corrected with new datasets, which resulted in a higher estimated proportion of mature fish at ages 1-3, meaning the stock has higher reproductive potential than previously estimated.
- The adult indices of relative abundance were expanded with larger and more complete datasets.
- Larger menhaden are not captured as often as smaller menhaden by the fisheries, a fact that was accounted for in the 2015 assessment but not the 2010 assessment.

What Data Are Needed?

The Atlantic menhaden stock assessment would be improved by the development of a coastwide fishery-independent survey to replace or supplement the existing indices. Accurate information on trends in abundance over time is critical for determining stock status and population trajectory in stock assessments. Also, development of a model that treats the stock as multiple regional stocks would be beneficial once sufficient age-specific data on movement rates of menhaden are available. Regional modeling would help to better characterize the movements of both the population and fishery, allowing for better management practices on a regional basis.

ATLANTIC MENHADEN *continued from page 8*

trillion eggs. This means that the spawning stock in 2013 appears to be more than adequate to produce the target number of eggs, and thus the population is not overfished.

Atlantic Coastal Management

Atlantic menhaden are currently managed under Amendment 2, approved in 2012. Amendment 2 established a 170,800 mt total allowable catch (TAC) that began in 2013. The established TAC represents a 20% reduction from the average landings of 2009-2011 and an approximate 25% reduction from 2011 landings, which accounts for the recent decline seen in commercial landings. The TAC was established by Amendment 2 in response to the 2010 benchmark stock assessment, which reported that menhaden were not overfished but were experiencing overfishing.

The Amendment allocates the TAC on a state-by-state basis based on landings history of the fishery from 2009-2011. States are required to close their fisheries when the state-specific portion of the TAC has been reached; any overages must be paid back the following year. Under the Amendment, 1% of the overall TAC is set aside for episodic events. If the episodic event set aside quota is unused as of October 31, it is redistributed to all the states on November 1 based on the Amendment 2 allocation percentages.

Amendment 2 also adopted new biological reference points for biomass which are based on maximum spawning potential, with the goal of increasing abundance, spawning stock biomass, and menhaden availability as a forage species.

Next Steps

Following the acceptance of the 2015 benchmark stock assessment for management use, the Board tasked the Technical Committee with conducting a thorough review of the peer review findings. The Board also tasked the Technical Committee to run projections that explore how various TAC levels will impact stock status. The Board will review the projection analyses at the Commission's Spring Meeting and further deliberate on management objectives and a TAC that will address the needs of the reduction and bait fisheries as well as the ecological services menhaden provides.

The Board also continues to place a high priority on developing ecosystem-based reference points (ERP) for management use. The ERPs are designed to account for the forage needs of menhaden's predator species such as striped bass, weakfish, and bluefish. The Board is working to develop specific objectives to provide direction to the working group at the Commission's spring meeting in May.

Under Amendment 2, the allocation of the TAC among states is to be reviewed three years after implementation. Allocation will be reevaluated based on updated landings history in 2016.

For more information, please contact Mike Waine, Senior Fishery Management Plan Coordinator, at mwaine@asmfc.org.



SPRING MEETING AGENDA *continued from page 6*

WEDNESDAY, MAY 6

- 2:30 – 3:30 PM **Shad and River Herring Management Board (continued)**
- Update on Shad and River Herring Related Activities of the Mid-Atlantic and New England Fishery Management Councils (If Necessary)
- 3:45 – 5:15 PM **ACCSP Coordinating Council**
- ACCSP Status Report (Program and Committee Updates)
 - Independent Program Review Progress
 - Review and Consider Approval of 2015 Request for Proposals and Funding Decision Document **ACTION**

THURSDAY, MAY 7

- 8:30 – 10:30 AM **Tautog Management Board**
- Review Technical Committee Report on Reference Point and Regional Stock Definitions
 - Consider Initiation of an Addendum to Respond to the 2015 Benchmark Stock Assessment and Peer Review
- 10:45 – 11 AM **ISFMP Policy Board (If Necessary)**
- 11 – 11:15 AM **Business Session (If Necessary)**



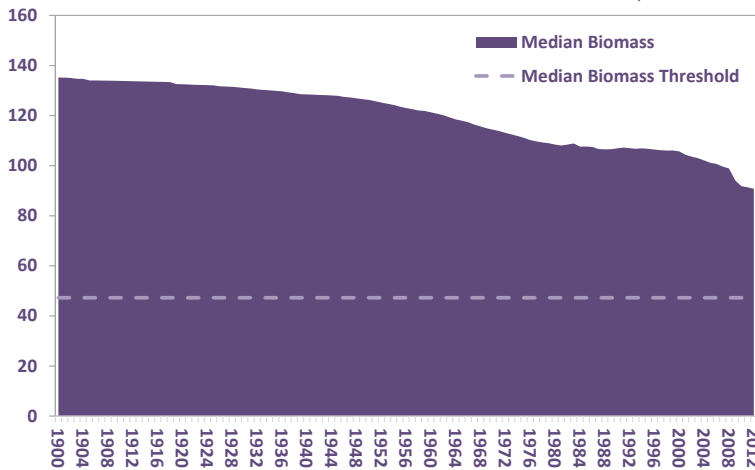
Black Drum & Tautog Benchmark Assessments Released

Black Drum Benchmark Assessment Finds Resource Not Overfished Nor Experiencing Overfishing

The South Atlantic State/Federal Management Board approved the 2015 Black Drum Benchmark Stock Assessment and Peer Review Report for management use. Based on the assessment results, black drum is not overfished and not experiencing overfishing. Median biomass was estimated to have declined slowly and steadily from 135.2 million pounds in 1900 to 90.78 million pounds in 2012, though the median biomass estimate in 2012 is still well above the median biomass that produces maximum sustainable yield (B_{MSY} ; 47.26 million pounds). The median maximum sustainable yield (MSY) estimate is 2.12 million pounds and provides an annual catch target that can be used to sustainably manage the fishery. The median overfishing limit (OFL), which provides a catch threshold, indicating when overfishing is occurring, is estimated to be 4.12 million pounds.

Black Drum Biomass

Source: ASMFC Black Drum Benchmark Stock Assessment, 2015



Black drum are a data-poor species. Their rarity and migratory patterns lead to highly variable levels of encounter in state surveys and fisheries. Further, limited size composition data has been collected, making the use of age-structured models unreliable. For these reasons, data-poor, catch-based modeling methods were used for the assessment. These models estimate reference points based on historical catch data and life history information.

The Black Drum Stock Assessment Subcommittee noted the black drum stock assessment would be improved by applying a more complex, data-rich assessment method such as a statistical catch-at-age model. Data limitations that need to be addressed to successfully make this transition are biological sampling (length and

age) of recreational and commercial fisheries and a fishery-independent survey tracking abundance and the age structure of the mature stock. Additionally, information about fish discarded in commercial fisheries and movement of fish would improve the assessment. A more detailed description of the stock assessment results is available at http://www.asmf.org/uploads/file/54d3a0462015BlackDrumAssessmentOverview_Feb2015.pdf.

Under the Black Drum Fishery Management Plan (FMP), which was approved in 2013, states were required to implement a maximum possession limit and minimum size limit (of at least 12 inches) by January 1, 2014, with an additional increase of the minimum size limit to at least 14 inches required by January 1, 2016. The FMP also includes a management framework to adaptively respond to future concerns or changes in the fishery or population. Given the assessment findings, the Board choose to not make any additional changes to the management program at this time. For more information, please contact Kirby Rootes-Murdy, Fishery Management Plan Coordinator, krootes-murdy@asmfc.org.

Tautog Benchmark Assessment Explores Regional Stock Units

The Tautog Management Board approved the 2015 Benchmark Stock Assessment and Peer Review Report for management use. Unlike previous assessments, which assessed the stock on a coastwide basis, the 2015 assessment evaluated stock status regionally to reflect differences in life history characteristics and harvest patterns. The assessment is the most comprehensive evaluation of stocks to date and provides multiple alternatives for how tautog can be managed regionally.

Based on analysis of all available data, including life history information, the assessment presents a preferred stock structure as three regional stocks: a Southern New England region (Massachusetts, Rhode Island, and Connecticut), a New York-New Jersey region, and a DelMarVa region (Delaware, Maryland, Virginia, and North Carolina). Due to overlapping harvest patterns along tautog's range and considerations for consistent management, the assessment also provided an alternative three-region definition where Connecticut is part of the NY-NJ region, and a two-region definition with a Northern stock (Massachusetts through New York) and a Southern stock (New Jersey through North Carolina). The assessment includes stock status and reference points for these alternative stock units as a comprehensive set of options for management use.

Tautog Stock Status and Proposed Biological Reference Points by Stock Regions

Stock Region	Stock Status	SSB Target	SSB Threshold	F Target	F Threshold
Southern New England	Overfished	3,883	2,912	0.15	0.20
	Experiencing Overfishing				
New York – New Jersey	Overfished	3,570	2,640	0.17	0.26
	Not Experiencing Overfishing				
DelMarVa	Overfished	2,090	1,580	0.16	0.24
	Not Experiencing Overfishing				



Under the regional stock structure, the Southern New England stock is overfished and experiencing overfishing. Spawning stock biomass (SSB) for this region is estimated to be 20% below the proposed SSB threshold of 2,300 metric tons (mt) and 40% below the proposed SSB target of 3,000 mt. The three-year average of fishing mortality (0.45) is above both the proposed fishing mortality target (0.26) and the threshold (0.44).

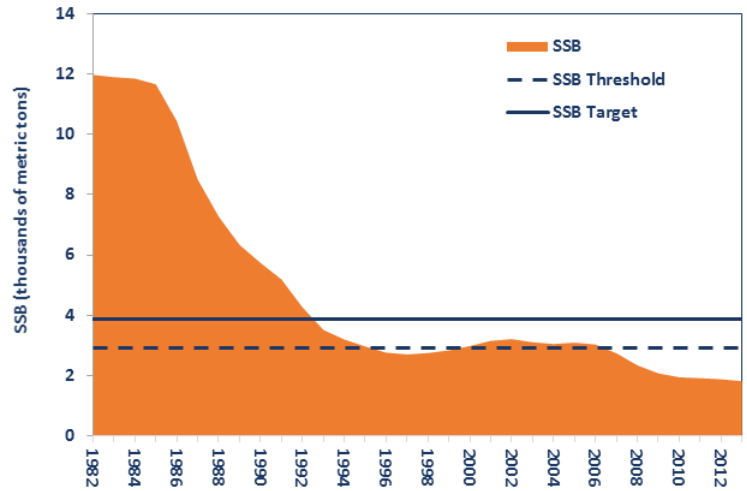
The New York-New Jersey stock is overfished but not experiencing overfishing. SSB is estimated to be 21% below the proposed SSB threshold of 2,600 mt and 42% below the proposed SSB target of 3,500 mt. Current fishing mortality (0.25) was found to be between the proposed target (0.17) and threshold (0.26), meaning overfishing is not occurring.

Conditions of the DelMarVa stock mirror those of the New York-New Jersey stock, with the stock being considered overfished but not experiencing overfishing. SSB is estimated to be 8% below the proposed SSB threshold of 1,600 mt and 30% below the proposed SSB target of 2,000 mt. Current fishing mortality (0.17) is between the proposed fishing mortality target (0.16) and threshold values (0.24).

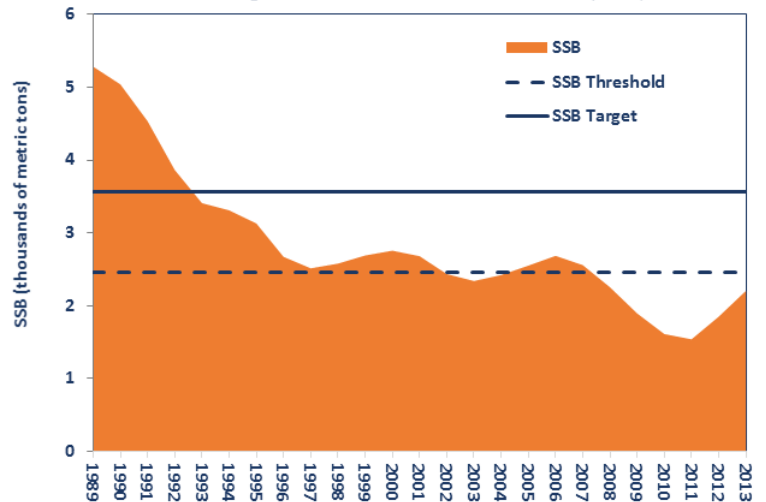
After reviewing the results of the stock assessment and peer review report, the Tautog Management Board accepted the 2015 benchmark stock assessment for management use. However, it expressed concern with the preferred stock structure that would split Long Island Sound harvest between two regions. In the absence of conclusive biological evidence to define the regional boundaries, the Board will consider the management and assessment implications of regionalization and choose its preferred regions for future management. In addition, the Board tasked the Tautog Technical Committee to develop reference points that provide consistent metrics to determine stock status across regions, the results of which will be presented to the Board at the Commission's Spring Meeting in May.

A more detailed description of the stock assessment results is available at http://www.asmfc.org/uploads/file//55131e862015TautogAssessmentOverview_Feb2015.pdf. The final assessment and peer review reports are available at http://www.asmfc.org/uploads/file//54eccd8cTautogStockAssessment_PeerReviewReport_Feb2015.pdf. For more information on the stock assessment, please contact Katie Drew, Senior Stock Assessment Scientist, at kdrew@asmfc.org; and for more information on tautog management, please contact Melissa Yuen, Fishery Management Plan Coordinator, at myuen@asmfc.org.

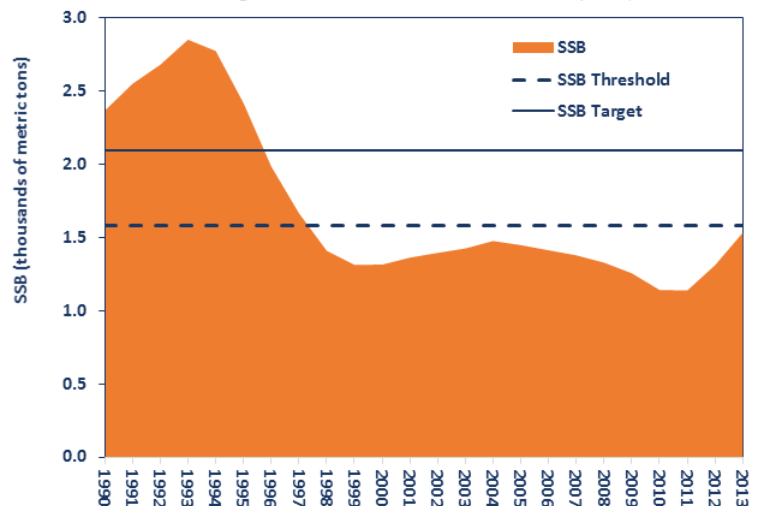
Southern New England Spawning Stock Biomass (SSB)
ASMFC Tautog Stock Assessment & Peer Review Reports, 2015



New York-New Jersey SSB
ASMFC Tautog Stock Assessment & Peer Review Reports, 2015



DelMarVa SSB
ASMFC Tautog Stock Assessment & Peer Review Reports, 2015



ASMFC Comings & Goings

COMMISSIONERS



Representative William J. Carson, Jr.

Representative William Carson has been appointed to serve as Delaware's Legislative Commissioner, replacing Senator Robert Venables, Sr., who served in that capacity for 12 years. Senator Carson is a member of the Delaware House of Representatives for the 28th District, which includes portions of Smyrna, Leipsic, Little Creek and Dover. He is a lifelong resident of Smyrna and has represented the 28th District since 2007. He is Chair of the Transportation, Land Use & Infrastructure Committee and Vice-Chair of the Manufactured Housing Committee. He also is a member of the Agriculture, Corrections, Judiciary, Natural Resources, Public Safety & Homeland Security, and Veterans Affairs Committees.

Representative Carson works for the Town of Middletown and is retired from the Department of Transportation. He is also a veteran of the Delaware Air National Guard and an Honorary Commander of the Dover Air Force Base. Welcome aboard, Senator Carson!



Senator Richard Colburn

Earlier this year, Senator Richard Colburn stepped down as Maryland's Legislative Commissioner to the ASMFC. He had served as Maryland State Senator for the past 19 years and as ASMFC Legislative Commissioner for the past 13 years. While his commitments as State Legislator limited his personal involvement with the Commission, he was ably represented at Commission meetings by his ongoing proxy **Russell Dize**. Russell diligently represented the interests of Maryland stakeholders on numerous species management boards and was an active participant of the Commission's Legislators and Governors' Appointees (LGAs). We are grateful for Senator Colburn's support of the Commission and for Russell's longstanding and dedicated participation. We wish them both the very best.



Senator Clark Jenkins

From 2003-2014, Senator Clark Jenkins served as a member of the North Carolina General Assembly representing the third Senate District (Dare County) and as the state's Legislative Commissioner to the ASMFC for the past two years. Over his two-year term, **Mike Johnson** faithfully served as his ongoing proxy representing the interests of North Carolina stakeholders on numerous species management boards. Mike also served as Representative Wainwright's ongoing proxy from 2005-2012. While we are sorry to see them both leave the Commission, we are grateful for their support and wish them both the very best.



Representative Walter Kumiega

For the past two years in his capacity as Maine House Chair of the Joint Standing Committee on Marine Resources, Representative Walter Kumiega served as the state's Legislative Commissioner to the ASMFC. Over that time, Representative Kumiega actively participated on the boards and sections that Maine has an interest in. He was also Vice Chair of the LGAs, providing guidance to the LGAs as they worked with their Administrative Commissioners to adopt the Commission's Financial Disclosure and Conflict of Interest Policy. We are grateful his contributions and wish him the very best.



Senator Brian D. Langley

No stranger to the Commission having served as Maine's Legislative Commissioner from 2011-2013, Senator Brian Langley rejoins the Commission as the state's new Legislative Commissioner. Since 2010, Senator Langley has represented the people of District 28, which includes Hancock and Knox Counties. He currently Chairs the Education and Cultural Affairs Committee, and is a member of the Marine Resources Committee.

Senator Langley is a graduate of the University of Southern Maine and Syracuse University. He is an entrepreneur, chef, and educator, having spent the more than 27 years teaching culinary arts at Hancock County Technical Center. Senator Langley also owns the Union River Lobster Pot restaurant in Ellsworth. He is involved with Boy Scout Troop 86; a board member of the First Congregational Church of Ellsworth and treasurer of the American Culinary Federation's Down East chapter. Welcome back, Senator Langley!



Delegate Dana Stein

In February, Delegate Dana Stein was appointed as Maryland's new Legislative Commissioner to the ASMFC. A Baltimore native, Delegate Stein has been a respected leader in his community and Democratic activities for many years. He has chaired the Baltimore County Democratic Central Committee. And, in 2002, he was appointed to the House of Delegates to fill a vacancy in District 11. He has served as President of the Liberty Road Community Council and GrassRoots Recycling, Chair of the Social Action Committee of Temple Oheb Shalom, and Vice President of Sudbrook Park, Inc.

While practicing law at Squire, Sanders & Dempsey in Washington, D.C., Delegate Stein founded Civic Works, a nationally recognized "Urban Peace Corps" that transforms the lives of young adults through community service. Participants work to rehab homes, build parks and gardens, tutor and mentor students, and teach disaster preparedness. Delegate Stein serves as President and Executive Director of Civic Works.

Delegate Stein has a B.A. in government from Harvard College, a law degree from Columbia Law School, and a Masters in Public Affairs from the Woodrow Wilson School at Princeton University. Welcome aboard, Delegate Stein!



Senator Robert L. Venables, Sr.

With this recent departure from office after serving 26 years on the Delaware State Senate, Senator Robert Venables stepped

continued, see COMINGS & GOINGS on page 13

ACCSP Honors Robert Mahood

On March 6, Mr. Robert Mahood, Executive Director of the South Atlantic Fishery Management Council (SAFMC), was presented with a gift recognizing his almost twenty years serving on the Coordinating Council of the Atlantic Coastal Cooperative Statistics Program (ACCSP). The gift was presented at the SAFMC meeting on St. Simons Island, Georgia.

Since 1995, the achievements of the ACCSP have been made possible in large part due to the hard work and dedication of the many individuals who participate in it. As a founding member of the ACCSP Coordinating Council, Mr. Mahood has been a steady leader right from the very beginning. His contributions to the ACCSP have had a lasting impact on the Program's ability to move forward with its mission.

Cheri Patterson, New Hampshire Fish and Game Department's Supervisor of Marine Program and Chair of the ACCSP Coordinating Council, had this to say about working with Mr. Mahood, "It is an honor to work with professionals of your caliber and vision. It is this level of commitment that allows us to produce the products that the entire Atlantic coast has needed for many years. Thank you for your hard work, selflessness, dedication, and leadership. We hope you always look upon this gift as a symbol of our appreciation, and that it will serve as a continual reminder of your achievements. Thank you for your contributions to the ACCSP. You are, and always will be, a valuable member of the Program."

The successes of the Program are the direct result of participants like Mr. Mahood. His dedication serves as a vital link in the chain that drives this effort. Thanks to Mr. Mahood, ACCSP is much



From left: ACCSP Coordinating Council Vice-chair Robert H. Boyles, Jr., honoree Robert Mahood, and ACCSP Coordinating Council former Chair Spud Woodward.

closer to succeeding in our mission to "Produce dependable and timely marine fishery statistics for Atlantic coast fisheries that are collected, processed, and disseminated according to common standards agreed upon by all program partners."

On behalf of all those involved in the Program the gift to Mr. Mahood was presented by Robert H. Boyles, Jr., Deputy Director for Marine Resources with the South Carolina Department of Natural Resources and Vice-chair of the ACCSP Coordinating Council.



ACCSP is a cooperative state-federal program focused on the design, implementation, and conduct of marine fisheries statistics data collection programs and the integration of those data into a single data management system that will meet the needs of fishery managers, scientists, and fishermen. It is composed of representatives from natural resource management agencies coastwide, including the Atlantic States Marine Fisheries Commission, the three Atlantic fishery management councils, the 15 Atlantic states, the Potomac River Fisheries Commission, the D.C. Fisheries and Wildlife Division, NOAA Fisheries, and the U.S. Fish & Wildlife Service. For further information please visit www.accsp.org.

COMINGS & GOINGS, continued from page 12



down as the state's Legislative Commissioner to the ASMFC. Senator Venables served on the Commission for 12 years with **Bernie Pankowski** serving as his ongoing proxy for his full tenure. Over that time, Bernie diligently represented the interests of Delaware stakeholders on all species management boards for which Delaware has a seat on and was an important contributor to the development of two Commission Strategic Plans. As an active participant of the Commission's LGAs, Bernie played a key role in developing the Commission's legislative and congressional agendas, as well as facilitating strong working relationships between the Commission and key Delaware federal legislators on a number of important issues, such as long-term funding for the Horseshoe Crab Trawl Survey. Personally, Bernie was an avid supporter of the Laura Leach Fishing Tournament, donating hundreds of dollars over the years to support state youth angler and education programs. While we are sorry to see Senator Venables and Bernie leave the

Commission, we are confident their longstanding commitment to marine fisheries conservation will benefit many future generations.



Max Appelman

In early April, Max Appelman will join the Commission staff as its new Fishery Management Plan Coordinator, for sturgeon and Atlantic striped bass. Max has a Master's Degree from Nova Southeastern University where his Master's work was on catch-per-unit-effort metrics for the North Atlantic pelagic longline fishery. Max was a pelagic fisheries observer in the Gulf of Mexico for two years. We are excited to have someone with Max's experience in and passion for marine fisheries joining the staff. Welcome aboard, Max!

Marin Hawk

In February, motivated by her passion for promoting sustainable seafood, Marin Hawk accepted a position with the Marine Stewardship Council as Fisheries Manager for U.S. Atlantic and Gulf

continued, see COMINGS & GOINGS on page 15

Magnuson-Stevens Reauthorization

2014 was an active year for the Magnuson-Stevens Fishery Conservation and Management Act on Capitol Hill. Both chambers of Congress produced reauthorization legislation for the primary federal law governing marine fisheries management in the U.S. exclusive economic zone. However, neither of the two bills advanced to the President's desk before the clock ran out on the 113th Congress at the end of December.

On March 4, Representative Don Young (R-AK) introduced H.R. 1335, "To amend the Magnuson-Stevens Fishery Conservation and Management Act to provide flexibility for fishery managers and stability for fishermen, and for other purposes." The text of the legislation mirrors that of the Magnuson-Stevens Reauthorization bill approved by the House Natural Resources Committee in 2014. The Committee hopes to hold a markup of H.R. 1335 this spring or summer.



NOAA Fisheries Research and Management, the President requested an increase in funding for Regional Councils and Fisheries Commissions of 2.24% (\$33.470 million), and an increase for Interjurisdictional Fisheries Act Grants of 2% (\$5 thousand). NOAA's 2016 blue book contains a detailed

summary of the budget request and can be viewed online at http://www.corporateservices.noaa.gov/~nbo/fy16_bluebook/FY2016BudgetSummary-web.pdf.

U.S. Congress Committee Changes

There are a number of new members in the House and Senate along the Atlantic coast. The committees with jurisdiction over Commission policy and funding have also undergone some significant changes. The most apparent are in the Senate where the majority

has flipped from Democrats to Republicans. In the House, the new Chair of the Natural Resources Committee, Representative Rob Bishop (R-UT) has changed the subcommittee overseeing fisheries. All marine fisheries issues will now be heard in the Water, Power, and Oceans Subcommittee.

For more information, please contact Deke Tompkins, Legislative Executive Assistant, at dtompkins@asmfc.org.

The Administration's 2016 Budget Request

President Obama's 2016 Budget Request to Congress contains a total of \$889.036 million for NOAA Fisheries' Operations, Research, and Facilities. The request represents an increase of 8.14% over the amount Congress appropriated in 2015. Within

President Obama's 2016 Budget Request: Fisheries Research and Management (in \$ thousands)

	2015 Enacted	2016 Obama Request	\$ change from 2015	% change from 2015
National Catch Share Program	\$25,000	\$27,505	\$2,505	10.02%
Expand Annual Stock Assessments - Improve Data Collection	\$70,000	\$73,749	\$3,749	5.36%
Economics and Social Sciences Research	\$7,300	\$7,446	\$146	2.00%
Salmon Management Activities	\$30,200	\$27,462	-\$2,738	-9.07%
Regional Councils and Fisheries Commissions	\$32,738	\$33,470	\$732	2.24%
Fisheries Statistics	\$22,000	\$22,432	\$432	1.96%
Fish Information Networks	\$22,000	\$22,080	\$80	0.36%
Survey and Monitoring Projects	\$24,000	\$24,503	\$503	2.10%
Fisheries Oceanography	\$2,100	\$2,133	\$33	1.57%
American Fisheries Act	\$3,700	\$3,812	\$112	3.03%
Interjurisdictional Fisheries Grants	\$2,500	\$2,505	\$5	0.20%
National Standard 8	\$1,000	\$1,024	\$24	2.40%
Reducing Bycatch	\$3,500	\$3,519	\$19	0.54%
Product Quality and Safety	\$6,700	\$6,870	\$170	2.54%
Total, Fisheries Research and Management	\$252,738	\$258,510	\$5,772	2.28%



Mike Waine Named Employee of the Quarter

In the four years since Mike Waine joined the staff he has significantly contributed to the Commission's fisheries management program, advancing the Commission's Vision of Sustainably Managing Atlantic Coastal Fisheries. In recognition of his accomplishments, Mike was named Employee of the Quarter for the first quarter of 2015.

A vast majority of Mike's workload over the past two years has focused on the successful completion of benchmark stock assessments for Atlantic striped bass and Atlantic menhaden, both of which were approved by an independent panel of fisheries scientists and accepted for management use by the respective species management boards. In response to the findings of the Atlantic striped bass assessment, Mike worked closely with the management board, technical committee and advisory panel on the development of Addendum IV to Amendment 6 to the Atlantic Striped Bass Fishery Management Plan. This process included multiple revisions to the draft addendum, 19 public hearings, and the review and compilation of thousands of submitted comment. Throughout it all, Mike brought his



Employee of the Quarter Mike Waine with ASMFC Executive Director Bob Beal

dedication, critical thinking, and commitment to developing a detailed and thorough management document for the board to base its decisions on.

Mike has also worked closely with our Science staff and members of the Atlantic Menhaden Stock Assessment Subcommittee to finalize and successfully vet, through a peer review process, the Atlantic menhaden benchmark stock assessment. The new assessment reflects a significant investment of time and effort by Mike and the Stock Assessment Subcommittee to seek

and incorporate new datasets and methodologies, ultimately redefining our understanding of Atlantic menhaden's stock status. At the same time, Mike has played a lead role in working with Science staff and the Biological Ecological Reference Points Workgroup to begin to develop alternative ecologically-based reference points to manage Atlantic menhaden. Responding to the findings of the assessment and peer review will require additional work by the technical committee and further deliberation by the management board on what harvest levels will best meet the needs of the reduction and bait fisheries while also addressing menhaden's ecological services. Based on his

continued, see MIKE WAINE on page 16

ASMFC COMINGS & GOINGS continued from page 13

STAFF



of Mexico fisheries and will be the primary outreach representative for fisheries in these areas. For two and a half years, Marin was the Commission's Fishery Management Plan Coordinator for coastal sharks, horseshoe crab, northern shrimp, shad & river herring, and spiny dogfish. While at the Commission,

Marin also helped to promote the Commission's science and management activities through social media platforms such as Facebook and Twitter. Marin's enthusiasm, can do attitude, and commitment to teamwork will be missed but will serve her well in her new job. We wish Marin the very best in all her future endeavors.

Megan Ware



On April 27, Megan Ware will be joining the Commission as a Fishery Management Plan Coordinator for American lobster, Jonah crab, weakfish and the South Atlantic species (Atlantic croaker, black drum, red drum, Spanish mackerel, spot, and spotted seatrout). Megan has a Master's in Environmental Management from Duke University, where she researched fish consumption advisories. She has been a Marine

Policy Fellow for the Woods Hole Oceanographic Institute, where she modeled the economics of beach nourishment decision and she has worked in a lobster hatchery in Maine. Welcome aboard, Megan!

This table provides new species assignments for ASMFC FMP Coordinators, with primary and secondary contacts identified. To ease transition, the secondary contacts will initially shadow the primary contacts with the intent of assuming primary coordination responsibilities over a 3-6 month period.

Species	Primary Coordinator	Secondary Coordinator
American Eel	Mike Waine	
American Lobster & Jonah Crab	Toni Kerns	Megan Ware
Atlantic Herring	Melissa Yuen	
Atlantic Menhaden	Mike Waine	
Atlantic Striped Bass	Mike Waine	Max Appelman
Bluefish	Kirby Rootes-Murdy	
Coastal Sharks	Melissa Yuen	
Horseshoe Crab	Kirby Rootes-Murdy	
Northern Shrimp	Max Appelman	
Shad & River Herring	Kirby Rootes-Murdy	
South Atlantic Species	Kirby Rootes-Murdy	Megan Ware
Spiny Dogfish	Melissa Yuen	
Sturgeon	Max Appelman	
Summer Flounder, Scup, Black Sea Bass	Kirby Rootes-Murdy	
Tautog	Melissa Yuen	
Weakfish	Melissa Yuen	Megan Ware
Winter Flounder	Melissa Yuen	

Atlantic States Marine Fisheries Commission

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2014 Annual Report Now Available

The Atlantic States Marine Fisheries Commission has released its 2014 Annual Report, which provides an overview of significant management actions and associated science activities the Commission and its member states

took in 2014 to maintain and restore the abundance of Commission-managed species.

The Report reflects ASMFC Commissioners' commitment to accountability and transparency in all they do to manage and rebuild stocks under their care. The report is available on the Commission website at www.asmfc.org under Quick Links or directly at http://www.asmfc.org/files/pub/2014AnnualReport_web.pdf.

MIKE WAINÉ continued from page 15

past accomplishments Mike is on point to assist the management board as it deliberates the future of menhaden management.

Mike's commitment to effective teamwork, excellence in performing his tasks, and his passion for fish and sustainable fisheries make Mike a valued coworker and contributor to the Commission's fisheries management program. As a result, Mike was not only named Employee of the Quarter but also promoted to Senior FMP Coordinator, where he will play an important role in mentoring new FMP Coordinators. Given his successful track record, no one is better suited. Mike has a Master's in Fisheries and Wildlife Sciences from North Carolina State University and a Bachelor of Science degree in Marine Biology from the University of North Carolina at Wilmington. As an Employee of the Quarter, he received a cash award, a small gift, and a letter of appreciation to be placed in his personnel record. In addition, his name is on the Employee of the Quarter plaque displayed in the Commission's lobby. Congratulations, Mike!

North Carolina Division of Marine Fisheries

Quota Monitoring Landings Report



North Carolina Quota Monitored Species Reporting

Species currently under a quota monitoring requirement by the North Carolina Division of Marine Fisheries (NCDMF) include summer flounder, striped bass, black sea bass North of Cape Hatteras, spiny dogfish, and river herring. Seasons are opened and closed by proclamation as shown in the table below. Landings reports are updated weekly during the proclamation season.

2015 North Carolina Quota Monitored Landings

Updated 04/30/2015

Species	2015 Total Quota (LBS)	80% of quota for Winter Fishery	2015 Transfer	2015 Harvest	Total Quota Remaining for 2015	Proclamation	Trip Limit (pounds)	Comments
2015 Summer Flounder	3,038,093	2,430,474	54,510	2,041,550	334,414	FF-22-2015	7,500	Closes 09/30/2015 at 6:00pm
2015 Black Sea Bass N of Cape Hatteras	243,422		509	233,731	9,182	FF-19-2015	100 trawl, 500 hook & line, fish pot per week	Closes when quota is met
2014/2015 Spiny Dogfish	7,276,052			5,198,084	2,077,968	FF-05-2015	per day: 20,000	Closes 04/30/2015 at 6:00pm
A.O. Striped Bass	360,360							
TRAWL	120,120			0	120,120	FF-1-2015	100 fish/day	Closes 3/31/15
SEINE	120,120			0	120,120	FF-77-2014	150 fish/day	Closes 3/31/15
GILL NET	120,120			0	120,120	FF-91-14	50 fish/day	Closes 02/14/2015
ASMA Striped Bass	137,500			80,843	56,657	FF-15-15	20 fish/day	Closes 04/30/2015
CSMA Striped Bass	25,000			25,573	-573	FF-14-15	10 fish/day	Closed 04/18/2015

* All figures are in pounds unless otherwise noted

For questions about quota monitoring or to report landings:

Permitted Species	FAX	E-mail Address	Telephone #
Striped Bass, River Herring	252-264-3723	LANDINGS@ncdenr.gov	800-338-7805
Summer Flounder, Black Sea Bass North of Cape Hatteras, Spiny Dogfish	252-726-3903	FLOUNDER@ncdenr.gov	800-682-2632



North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

Donald R. van der Vaart
Secretary

MEMORANDUM

TO: N.C. Marine Fisheries Commission

FROM: Kevin Brown
Division of Marine Fisheries, NCDENR

DATE: March 31, 2015

SUBJECT: NC Marine Fisheries Shrimp Bycatch Reduction Workgroup Commission Meeting

The NC Marine Fisheries Commission met at 9:00 am on March 31, 2015 at the North Carolina History Center, Tryon Palace at 529 South Front Street, New Bern. The following attended:

Advisers: Frank Helies	GSAFF
Gary Graham	TX Sea Grant
Blake Price	NOAA Fisheries HSU
Steve Eayrs	GMRI
Dr. Pingguo He	UMass
Dan Foster	NOAA Fisheries HSU
Sara Mirabilio	NC Sea Grant
Scott Baker	NC Sea Grant

Absent: Jeffery Hopkins	Commercial Fisherman (Workgroup Member)
Gordon Winfrey	Gordon Net Works (Workgroup Member)

Commissioners: Mikey Daniels	Wanchese Fish Co.
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Staff: Kevin Brown	NCDMF
Trish Murphy	NCDMF
Katy West	NCDMF
Kathy Rawls	NCDMF
Jason Rock	NCDMF
John Hadley	NCDMF
Laura Lee	NCDMF
Louis Daniel	NCDMF

Public: Allen Faircloth
 Kenny Sessions
 Jon Willis
 Allen Powell
 David Knight SELC
 Birdie Potter
 David Bush
 Julian Anderson Mate-Plan B
 Stevenson Weeks NCFA
 Blakely Hilderbrand SELC
 Stevenson Weeks NCFA
 Lauren Morris NCFA
 Chip Collier SAFMC

Work Group Members

Stevie Davis	Commercial Fisherman
Kenny Rustick	Commercial Fisherman
Clyde Phillips	Clyde Phillips Seafood
John Broome	J.B. Fishing
Steve Parish	S and S Trawl Shop
Kenny Midgett	Wanchese Fish Co. /Wanchese Trawl and Supply Co.
Mikey Daniels	Wanchese Fish Co.
Brent Fulcher	B and J Seafood
Virgil Potter	Potter Net and Twine
Clyde Potter	Commercial Fisherman

Sara Mirabilio, serving as chair, called the meeting to order. Kevin Brown introduced himself; asked for name and affiliation of the group. He also recognized Louis who thanked everyone for joining us and for those that traveled; and acknowledged NCFA for setting up sea time.

PUBLIC COMMENT

Sara Mirabino introduced everyone and talked about what was expected from each person present.

“How We Got Here”: with *Kevin Brown*

Kevin Brown set the stage for how we got here. He explained the history of the latest shrimp FMP and explained how the MFC set the scope of the amendment to address bycatch. Once finished, he explained the management strategy that brings the group together. He discussed the goal of the 40% state initiative compared to federal certification requirements. This 40% goal works out to 58% reduction over a naked net. This is the group’s goal. He discussed how the work group was formed, and how the work group would attack that proposal. The group would choose 3 BRD’s and 2 backups to test to try and achieve that 40%. Also discussed acceptable shrimp loss

with group. He explained getting the MFC conservation fund grant; meeting with the NCFA to get industry pledge of 3 boats for 30 tows each. He went through today's tasks of learning about brd research, selecting gears to test and provide recommendations for acceptable shrimp loss. He explained that this would be a 3 year process and that this year we would focus on the brown shrimp fishery in Pamlico Sound. Anything that show promise will take to the MFC and to continue to seek funding to work on white shrimp and ocean fisheries. He encouraged workgroup members to talk to the scientists/researchers present and discuss ideas and potential for independent studies.

Sara M. went over the agenda with the group. When seagrass facilitates need full participation, mutual understanding, and inclusive solutions. She then provided ground rules for the group.

Industry perspectives

Brent F. touched on Kevin's comments, discussed how this became an issue, how he registered his boats to apply for federal grants, that this needs to go forward but did not happen. Going to have to get some grants. Not all bycatch is dead or not utilized. Need to talk about devices, sound, vibrations, etc. Also have folk that try other things. Fishermen don't want to deal with bycatch, need to think outside the box.

Clyde Phillips-electronic device, "shark shield", short battery life could be issue but could keep fish out of net, knows we have to reduce bycatch, knows these devices work, let's try them to find out what works best, lot of things out there, maybe more people willing to take observers.

Steve Davis- limit what is getting into the net instead of trying to get fish out of net. Also test small and big boats.

Kenny R. discussed areas where we start work bycatch is bad then disperses. Need to test on smaller class boats.

Kenny Midgett- use sound in some way

Mikey D. tried testing different devices for 2 years, made all of his boats test something, some did nothing, some did well. Hesitated to offer boats for testing, doesn't like to be threatened.

John Broome- 2 inch spacing TED and use GoPro to test, made him money-better product, longer tows. Did some testing with chem lights.

Steve Parrish discussed starting in the 70s doing TED testing, then BRDs. Discussed how his clients are concerned with shrimp loss, look at short term loss and long term gain. Loss of 5 lbs of shrimp in one net could be \$1500 by end of week.

Group discussed -"Flatbar Grid" something worth trying. Smaller TED spacing works but heavy, can be offset by hard float. Clyde-soft TED is good on bycatch and finfish should be focus.

"Bycatch Reduction Device (BRD) Testing Overview: Methodology & Criterion"

Dan Foster & Blake Price, research fishery biologists, NOAA Fisheries Harvesting Systems Unit

Dan Foster gave presentation on gear testing protocol. Been testing for 25 years. Best to test on commercial boats, get real world results. It is give and take between fishermen and observers. His group is partly from the industry and researchers. The key is working with industry. Dive Trawling-open invitation for others to bring gear and people to test on June 9-June 24, 2015. Will dive on gear and have GoPro cameras available to observe

gear being tested while under tow. Use quad rigged vessels; use 2 outside nets; mark the outside bags. Keys to success: good gear, keep catch separate, switch brd between nets.

For Gear Testing-

- Switch sides of gear periodically to avoid side bias
- “Tune” gear using same TEDs and TED angles
- Work with observer takes a little more time
- Keep catch separate on deck for sampling purposes
- Moving toward consistent regulations in Gulf and Atlantic

“How to choose and test a BRD”

Steve Eayrs, research scientist, Gulf of Maine Research Institute (GMRI)

Steve Eayrs-worked in prawn industry and Persian Gulf, gave “insight into Bycatch”
Has given TED workshops all over the world. Worked in the New England Fish trawl industry for 8 yrs.

When choosing BRD several things to consider

- Bycatch target-behavior
- Valuable non-target species?
- Catch volume
- Simplicity
- Mindful that what works in one location may not work in others
- Cost?
- Efficiency

BRD efficiency- range of considerations: location, size, speed, weather, behavior, chaffing nets, etc. Mindful of what works in one location may not work in another. Need to think about having multiple devices-not just one device for all problems.

Gave many examples and discussed

“JTED” “Popeye” “Underwater Lights” “Witch’s Hat”

Adjusting doors-headline height

Using multiple devices at one time beneficial

**Crucial to be patient when testing and don’t give up to quickly on given device.

“Fish behavior and speciation and their role in capture by fishing gears: A case study of the topless trawl”

Dr. Pingguo He, associate professor of fisheries, School for Marine Science and Technology, University of Massachusetts Dartmouth

“Fish Behavior in shrimp Trawls”

Sound-sea water is a good medium for sound and fish can hear a trawl from quite far away (1500m). Well before the fish sees the trawl they are adjusting their behavior for approaching sound.

When fish sees the trawl door they disperse in a manner where they can keep one eye on the trawl doors at all times.

2 projects were designed and tested using different trawl doors and bridles.

These projects kept the doors off the bottom and also used longer bridles (floating) which worked very well for excluding flounder which was there target bycatch species.

Whether fish are loners or schooling they will swim with the trawl mouth if in front of it. Bridle length/sweep is important; longer sweep. Discussed fish herding behavior and lack of herding in shrimp. Discussed role of fish density; loners, schooling. Discussed role of towing speed and fish swimming speed..

Temperature can play a big part in fish's ability to maintain speed while swimming. If it is colder swim time/speed is greatly reduced in species versus warmer temperatures in the water.

Towing speed and current should be taken into account when working with nets to exclude bycatch. Speeding up even .5 knots will make a huge difference to fish swimming with the mouth of the net.

Topless Shrimp Trawl-headrope is much longer than footrope. Tried this in Maine and had great success. Looks like an upside down net. This project will be tried in NC by DMF with collaboration from Dr. Pingguo He.

“Nordmore Grid”-plastic TED 1 inch Bar
Very light
Very good at excluding fish

Questions from Work Group??

Q: What was bottom contour and how will that affect?

A: Grass will be a problem for 1 inch bar TED, it will get clogged up. Tried rolling grid in front but ran into issues with it.

Q: Has anyone tried electricity?

A: In China they tried using it and it worked very well but people kept increasing the voltage and government couldn't control it so it was banned overnight.

Gary Graham-Tried electric tickler chain years ago, worked with a few problems. Probably needs to be adjusted and re-tested.

Q: Vibration around trawl doors to scare fish away from net?

A: The vibration would be overshadowed by the noise of the boat and gear.

Q: Has anyone tried “counterherding”? Using ropes to guide fish away from trawl mouth before entering.

A: No but it is a good idea.

Lunch (on your own)

“Discussion of Fisheye Alternatives: Ricky (Double Fisheye) & Kiel BRDs”

Discussion Leaders: *Frank Helies, Gulf & South Atlantic Fisheries Foundation (GSAFF); Gary Graham, Texas Sea Grant*

Gary Graham and Frank Helies discussed the “Ricky BRD” and “Kiel BRD”

“Ricky BRD”

Simple

Cost effective

Double fish eye with 8” hard plastic float

58% reduction

No shrimp loss
Slow dragging (2.2 knots) could be concern
Fisherman love it
Elephant ears behind fish eyes very important, otherwise escape opening gets covered up.
9' from the tie off rings
A float in the net also did very well

“Kiel BRD”
31% reduction of croaker
Shrimp loss could be issue but weather when tested also problematic. Needs further testing.

DMF will give permits to fisherman to try different devices for testing.

Panel discussed current NC regulations and what will be added within the near future...
An additional BRD, square mesh, or TED with reduced bar.
May 1st proposed implementation.

“Discussion of Popeye Fishbox”

Discussion Leaders: *Steve Eayrs, GMRI; Mikey Daniels, Wanchese Fish Co.*

Most successful finfish reducer in prawn shrimp.
Concerns for safety- heavy metal piece moving around on deck at head height.
48% reduction over 54 tows in Tiger Shrimp industry

“Discussion of Square Mesh Panels (skylights, tailbags and etc.)”

Discussion Leaders: *Kevin Brown, N.C. Division of Marine Fisheries; Kenny Midgett, Wanchese Trawl Supply*

Kevin Brown discussed square mesh panels.
In 2008 did 30 tows with 1 ¾ square mesh tail bags which resulted in 51% reduction with very little shrimp loss
Also did 2 inch and got a 57% reduction
An issue could be finfish “mesh” down in tail bag netting.

“Skylight Panel”- Presented by Mickey and Kenny who gave description of it and enjoyed using it. Was not as effective with mongoose net.

“Discussion of Composite Panel BRD”

Discussion Leaders: *Dan Foster & Blake Price, NOAA Fisheries HSU; Clyde Phillips, Clyde Phillips Seafood*

Creates “slow flow” area where fish aggregate
26% reduction
50% reduction when working with spooker cone
Clyde- tried it with spooker cone and it did very well, up to 50%. Could have an issue with clogging in Pamlico Sound due to grass.

“Discussion of Modified Nested Cylinder (ver. 3.0)”

Discussion Leaders: *Dan Foster, NOAA Fisheries HSU; Frank Helies, GSAFF*

“Nested Cylinder”-creates “slow flow” areas

50% reduction

Shrimp loss manageable when sock inside cylinder extended to compensate

Industry thought it was too bulky and is trying to stream line it and make it manageable.

“Discussion of Bycatch Deflector Devices”

Discussion Leaders: *Scott Baker, North Carolina Sea Grant; John Broome, independent commercial trawler*

Moss or grass will clog this device fast, works well in the ocean.

40% reduction and no shrimp loss

When tested it was compared to net with TED and BRD

“Discussion of TED/BRD Combos: NOAA Fisheries (L&J) and Billy Burbank”

Discussion Leaders: *Gary Graham, Texas Sea Grant*

Using a TED/BRD as one package

Both tested used spooker cone

Cost could be issue with both

Neither lost shrimp

“Billy Burbank” got 51% reduction

“Discussion of Hummer Lines”

Discussion Leaders: *Gary Graham, Texas Sea Grant*

Not a standalone device

59% reduction

Possible variation with steel cable

Didn't get tangled up even in rough weather

Open discussion of additional bycatch reduction technological solutions; final thoughts

Kenny Midgett-Question of when topless trawl starts research project?

Answer from work group: Field work will start with season

Kevin Brown discussed requirements for testing.

60 tows which was set by MFC and minimum of 30 tows for certification

Tow time of 2 hrs.

Group asked for suggestions from Dan Foster, Gary Graham, and Frank Helies.

Suggestions given from Dan Foster, Gary Graham, and Frank Helies where-

“Composite panel” with square mesh or cone for grass problems

Reduced bar spacing TED with possible composite panel- recommend 3” bar or smaller

“Ricky BRD” and possible put beside each other instead of one on top of another

Design of project discussed

Control Net will have 4” TED with Florida Fish Eye and 1 ½” tail bag

Experimental Net will be able to adjust for efficiency to get to 40% reduction

Group decided Reduced Bar Spacing TED as a standalone possible option
Group decided “Virgil” and “Midgett” design as possible candidate
Group also added hummerline as possible device to try

Voting on candidate BRD prototypes for field trials; floating break

Ballets cast

First Option-“Ricky BRD”

Second Option-“Composite Panel” and spooker cone with option at 30 tows to switch to escape panel if clogging from grass becomes issue

“Revote for third option and two backups because all others were so close in voting.”

Third option-Reduced Bar Spacing TED-3” round bar

First Backup- “Virgil”

Second Backup- Hummerline

Motion to change “Virgil” as backup because so similar to composite panel.

Group tabled motion to change “Virgil” as backup due to it being so similar to composite panel and acceptable shrimp loss.

Adjourn

Cc: Catherine Blum
Mike Bulleri
Scott Conklin
Dick Brame
Louis Daniel
Charlotte Dexter

Jess Hawkins
Jennie Hauser
Dee Lupton
Nancy Marlette
Lauren Morris
Phillip Reynolds

Jerry Schill
Gerry Smith
District Managers
Committee Staff Members
Marine Patrol Captains
Section Chiefs

Table 1. Finalized data collected by month through the NCDMF Observer Program through December 2014.

Month	Trips		Observer Large Mesh				Observed Takes By Species								
	Estimated ¹	Actual ²	AP Attempts ³	Trips	Yards	Coverage ⁴	Kemp's		Green		Loggerhead		Unknown	A. Sturgeon	
							Live	Dead	Live	Dead	Live	Dead	Live	Live	Dead
WINTER															
January	206	244	76	3	800	1.2									
February	774	594	14	45	26,415	7.6								1	
SPRING															
March	1,694	1,850	5	93	62,462	5.0									15
April	1,669	1,036	100	38	18,780	3.7								1	
May	1,468	308	29	2	3,400	0.6									
SUMMER															
June	1,679	944	41	83	85,315	8.8									5
July	2,042	843	55	90	79,932	10.7									
August	2,119	1,048	67	109	116,214	10.4									
FALL															
September	2,618	2,279	49	276	224,893	12.1	2		4		1		1	4	2
October	4,283	1,983	96	249	201,310	12.6	3		10	7	1		1	18	
November	1,858	1,188	109	112	91,915	9.4			3					11	
WINTER															
December	159	189	108	1	300	0.5									
Total	20,569	12,506	749	1,101	911,736	8.8	5	0	17	7	2	0	2	55	2

¹ Finalized trip ticket data from 2013

² Finalized trip ticket data for 2014

³ Alternative Platform trips where no fishing activity was found

⁴ Based on actual trips (2014) and observer large mesh trips

Table 2. Finalized data collected by month through the NCDMF Observer Program through December 2014.

Month	Trips		Observed Takes By Species											
	Estimated ¹	Actual ²	Observer Small Mesh			Kemp's		Green		Loggerhead		Unknown	A. Sturgeon	
			Trips	Yards	Coverage ³	Live	Dead	Live	Dead	Live	Dead	Live	Live	Dead
WINTER														
January	743	681	11	7,750	1.6									
February	856	782	20	11,430	2.6									1
SPRING														
March	1,344	561	6	2,130	1.1									
April	1,672	1,141	26	39,255	2.3									1
May	1,197	778	13	15,600	1.7									
SUMMER														
June	841	792	4	5,000	0.5									
July	714	685	10	16,020	1.5									
August	818	907	19	22,540	2.1									
FALL														
September	811	1,039	24	14,390	2.3									
October	1,210	1,396	34	12,240	2.4			1						
November	877	850	37	15,920	4.4									
WINTER														
December	674	555	36	19,550	6.5									
Total	11,757	10,167	240	181,825	2.4	0	0	1	0	0	0	0	0	2 0

¹ Finalized trip ticket data from 2013

² Finalized trip ticket data for 2014

³ Based on actual trips (2014) and observer small mesh trips

Table 3. Preliminary data collected by month through the NCDMF Observer Program through March 2015.

Month	Trips		Observer Large Mesh				Observed Takes By Species								
	Estimated ¹	Actual ²	AP Attempts ³	Trips	Yards	Coverage ⁴	Kemp's		Green		Loggerhead		Unknown	A. Sturgeon	
							Live	Dead	Live	Dead	Live	Dead	Live	Live	Dead
WINTER															
January	206	392	85	16	12,600	7.8									2
February	774	364	123	42	24,375	5.4									
SPRING															
March	1,694	1,596	73	130	92,590	7.7								9	
Total	2,674	2,352	281	188	129,565	7.0	0	0	0	0	0	0	0	11	0

¹ Finalized trip ticket data averaged from 2011-2014

² Preliminary trip ticket data for 2015

³ Alternative Platform trips where no fishing activity was found

⁴ Based on estimated trips and observer large mesh trips

Table 4. Preliminary data collected by month through the NCDMF Observer Program through March 2015.

Month	Trips		Observer Small Mesh			Observed Takes By Species								
	Estimated ¹	Actual ²	Trips	Yards	Coverage ³	Kemp's		Green		Loggerhead		Unknown	A. Sturgeon	
						Live	Dead	Live	Dead	Live	Dead	Live	Live	Dead
WINTER														
January	743	446	15	9,440	2.0									
February	856	244	29	15,905	3.4									
SPRING														
March	1,344	541	35	20,940	2.6									
Total	2,943	1,231	79	46,285	2.7	0	0	0	0	0	0	0	0	0

¹ Finalized trip ticket data averaged from 2013-2014

² Preliminary trip ticket data for 2015

³ Based on estimated trips and observer small mesh trips



February 2015 Council Meeting Report

February 10 – 12, 2015

Raleigh, North Carolina

The following summary highlights Council actions and issues considered at the February 2015 Council Meeting in Raleigh, North Carolina. Presentations, briefing materials, and audio recordings are available at www.mafmc.org/briefing/february-2015.

Deep Sea Corals Amendment

The Council met to consider taking final action on the Deep Sea Corals Amendment. After reviewing a summary of public comments and considering recommendations from the Fishery Management Action Team (FMAT), the Council voted to postpone final action on the amendment until the June 2015 Council meeting. This decision was driven in part by concerns that additional input was needed from the Advisory Panel and other members of the commercial fishing industry regarding the specific areas being considered for protection in the amendment. To address these concerns, the Council voted to convene a workshop that will consider potential revisions to the boundaries of proposed discrete coral zones. Workshop invitees will include the Squid, Mackerel, and Butterfish Advisory Panel, the Ecosystems Advisory Panel, FMAT members, Council members, coral scientists, and other interested stakeholders. The workshop will be followed by additional analysis and review by the FMAT.

The Council also approved several modifications to the amendment's alternatives, including:

- Addition of options for commercial tilefish and commercial red crab exemptions in discrete zones;
- Addition of transit provisions to the range of alternatives; and
- Addition of a prohibition on anchoring in deep sea coral zones to the list of frameworkable items.

The Council expects to review the outcomes of this workshop and take action on the amendment at the June 2015 meeting. Additional information about the workshop and future public comment opportunities will be posted on the [Deep Sea Corals page](#) of the Council's website.

Surfclam and Ocean Quahog Cost Recovery Amendment

After reviewing public comments collected between December 15, 2014 and January 16, 2015, the Council selected preferred alternatives for the Atlantic Surfclam and Ocean Quahog Cost Recovery Amendment and approved the amendment for submission to the Secretary of Commerce. The amendment addresses several issues in the surfclam and ocean quahog fisheries, including the cost recovery provisions of the Magnuson-Stevens Fishery Conservation and Management Act (MSA). The Council adopted the following preferred alternatives:

Cost Recovery: Alternative 5 (Shareholder Pays; Tilefish Model). Under Alternative 5, those surfclam and ocean quahog shareholders, permanent individual transferrable quota allocation holders, whose quota are used to land surfclams and ocean quahogs would pay the cost recovery fee. This is the same cost recovery process used in the Council's tilefish individual fishing quota fishery, and would bring the fishery management plan (FMP) to consistency with the cost recovery provisions of the MSA.

Biological Reference Points Update Mechanism: Alternative 2 (Redefine the Status Determination Criteria). This alternative would streamline the management process by allowing surfclam and ocean quahog stock status determination criteria to be automatically updated in the FMP without the need to go through a lengthy amendment process, as long as specific criteria are met.

Optimum Yield (OY) Ranges: Alternative 2 (Remove OY Range from FMP; Advisors Develop OY Recommendations during Specifications). Under this alternative, the OY ranges for surfclams and ocean quahogs would be removed from the FMP, and the Advisory Panel will develop OY recommendations as part of the specifications process. This will provide for a more efficient process when setting catch and landings limits through specifications.

Cooperative Research

The Research Set-Aside (RSA) committee met to discuss the Council's role in cooperative research. The Council is working to determine how to best facilitate cooperative research on Council-managed species given the issues with the RSA program that [led to its suspension](#). During the committee meeting, Council staff presented a draft timeline for the review, clarified objectives and desired outcomes, and proposed next steps. The committee supported a proposal to hold an RSA workshop in mid-2015 with stakeholders and committee members. The Council will also conduct a pre-workshop informational webinar to identify stakeholders and gather initial ideas.

Climate Change and Fisheries Management

The Council received several presentations on climate change and fisheries management. Roger Griffis presented an overview of NOAA Fisheries' Draft Climate Science Strategy, which was developed "to increase the production, delivery, and use of climate-related information to marine and coastal resource managers, resource users and others at regional to national scales." The draft document is currently open for public comment through March 31, 2015. Details are available at <http://www.st.nmfs.noaa.gov/ecosystems/climate/national-call-for-comments>.

In addition, the Council reviewed the first working draft of a Climate White Paper, which is being developed as part of the Council's ongoing development of an Ecosystem Approaches to Fisheries Management (EAFM) guidance document. The Council will use the information provided in the paper as it begins development and implementation of management approaches which take climate change and variability into account. The paper, which focuses on the impacts of climate change and variability on fish stocks relative to existing fishery science and management programs, identifies several priorities for Council consideration:

- Conduct assessment of risk/vulnerability to climate change by species;
- Include climate effects/drivers in single species stock assessments (with progression/transition to multispecies assessments);
- Incorporate climate effects on habitat and EFH considerations;
- Evaluate potential impacts on fleet dynamics (to include social and economic analyses); and
- Evaluate climate change impacts at the ecosystem level.

The Council will continue discussion about the implications of climate change and variability for fishery conservation and management at its April meeting in Long Branch, NJ.

Joint Industry-Funded Monitoring Amendment

The Council received an update on the development of an amendment to allow cost-sharing for industry funding of observer coverage in Mid-Atlantic and New England fisheries. The Amendment also considers specific coverage targets for the Atlantic mackerel and Atlantic herring fisheries. Concurring with motions made by the New England Fishery Management Council at its January 2015 meeting, the Council requested additional development of the Amendment, especially as relates to additional types of observer coverage that may be more affordable. The Council also requested additional analysis on the potential impacts of the alternatives considered in the amendment. It is anticipated that the Amendment will be re-considered for final action at the June 2015 Council meeting.

Other Business

Listening Session: MRIP Recreational Effort Estimation Methodology

The Council held a listening session that focused on new methods of estimating recreational fishing effort. Rob Andrews from NOAA Fisheries' Office of Science and Technology gave a presentation and answered questions from the Council and public about the new methodology.

Data Collection Presentations

Mike Cahall gave a presentation on recent and upcoming data collection initiatives being undertaken by the Atlantic Coastal Cooperative Statistics Program (ACCSP). Dan Morris, from NOAA Fisheries Greater Atlantic Regional Fisheries Office (GARFO), gave an update on the Fishery Dependent Data Visioning Project—a collaborative effort between GARFO and the Northeast Fisheries Science Center to modernize the region's fishery dependent data collection systems. A draft Electronic Technology Implementation Plan was recently released as part of this project.

Statement of Operating Practices and Procedures

The Council reviewed proposed revisions to its Statement of Operating Practices and Procedures (SOPPs). In response to input from Council members, staff will make additional revisions to the section describing requirements and procedures for recusals. The Council will revisit the issue at the April 2015 meeting.

Ricks E Savage Award

George Darcy was named this year's recipient of the Ricks E Savage Award. The award is given each year to a person who has added value to the MAFMC process and management goals through significant scientific, legislative, enforcement, or management activities.

During his 14-year tenure as the NOAA Fisheries' Assistant Regional Administrator, George Darcy played an important role in the success of the Mid-Atlantic Council's fisheries management. In this position, Mr. Darcy worked closely with the Mid-Atlantic Council to accomplish a number of successes, including the rebuilding of most of the Council's managed fisheries. He also played an integral role in the Council's development of its Omnibus Annual Catch Limit and Accountability Measure Amendment that ensured FMP compliance with 2006 amendments to the Magnuson Act.

George Darcy retired in April 2014, after over 30 years of dedicated and responsible public service.



Ricks E Savage award recipient George Darcy (center) with Council Chairman Rick Robins (left) and Regional Administrator John Bullard (right).

Next Meeting

April 14-16, 2015: Long Branch, New Jersey

Ocean Place Resort

1 Ocean Blvd.

Long Branch, NJ 07740

Telephone: 732-571-4000



North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

Donald R. van der Vaart
Secretary

MEMORANDUM

TO: Louis Daniel
Sammy Corbett

FROM: Chris Batsavage, Protected Resources Section Chief/Special Assistant for
Councils
Division of Marine Fisheries, NCDENR

DATE: March 31, 2015

SUBJECT: Mid-Atlantic Fishery Management Council Meeting—February 10-12, 2015

The Mid-Atlantic Fishery Management Council (Council) met on February 10-12, 2015 in Raleigh, NC. Management actions taken by the Council are discussed below and are summarized in the attached Council Meeting Summary.

DEEP SEA CORALS AMENDMENT

The Council met to consider taking final action on the Deep Sea Corals Amendment. Management alternatives to protect deep sea corals included both broad and discrete zone options with minimum depth contours ranging from 200 to 500 meters. Most or all bottom-disturbing fishing gear could be prohibited from these zones, depending on the management alternative chosen. The Council voted to postpone final action on the amendment until the June 2015 Council meeting based on public comments received that raised concerns about additional input needed from the Advisory Panel and other members of the commercial fishing industry regarding the specific areas being considered for protection in the amendment. To address these concerns, the Council voted to convene a workshop that will consider potential revisions to the boundaries of proposed discrete coral zones.

BLUELINE TILEFISH

As voted for at the December 2014 Council meeting, a letter was sent to the mid-Atlantic and southern New England states requesting the states adopt consistent incidental commercial trip limits and recreational bag limits for blueline tilefish to prevent the expansion of this fishery. The letter was in response to last year's sharp increase in commercial blueline tilefish landings in New Jersey, where no regulations exist. Fishermen indicated that they planned on commercial fishing for blueline tilefish again this year, but states such as New Jersey and Connecticut advised the Council that they were unable to implement regulations this year. As such, Council Chairman Rick Robins scheduled an emergency Council meeting via webinar on February 25 from 1:30 to 4 p.m. to consider requesting emergency action by National Marine Fisheries

1601 Mail Service Center, Raleigh, North Carolina 27699-1601
Phone: 919-707-8600 \ Internet: www.ncdenr.gov

Service under section 305(c) of the Magnuson-Stevens Fishery Conservation and Management Act for deepwater snapper/grouper species, including blueline tilefish, within the Mid-Atlantic Fishery Management Council's jurisdiction (New York-Virginia). The South Atlantic Fishery Management Council manages blueline tilefish from North Carolina to Florida, but there is no comprehensive management in the mid-Atlantic or in New England. Maryland and Virginia are the only Mid-Atlantic States that manage blueline tilefish and their regulations include a 300-pound (whole weight) commercial trip limit and an aggregate recreational tilefish bag limit of 7 fish per person.

UPCOMING MEETING

The next regularly scheduled meeting of the Mid-Atlantic Fishery Management Council will be April 14-16, 2015 at the Ocean Place Resort in Long Branch, NJ.



North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

Donald R. van der Vaart
Secretary

MEMORANDUM

TO: Louis Daniel
Sammy Corbett

FROM: Chris Batsavage, Protected Resources Section Chief/Special Assistant for
Councils
Division of Marine Fisheries, NCDENR

DATE: March 31, 2015

SUBJECT: Mid-Atlantic Fishery Management Council Blueline Tilefish Emergency Action
Meeting—February 25, 2015

The Mid-Atlantic Fishery Management Council (Council) met via webinar on February 25, 2015 to consider requesting emergency action for blueline tilefish (and possibly other deepwater species), within the Council's jurisdiction. Management actions taken by the Council are discussed below.

BLUELINE TILEFISH

The Council voted to request that the National Marine Fisheries Service implement emergency rules to restrict commercial and recreational landings of blueline tilefish in the Mid-Atlantic region's federal waters (New York-Virginia). The Council's recommendations include a 300 pound (whole weight) commercial trip limit and a seven fish per-person recreational bag limit. These measures are intended to prevent depletion of the blueline tilefish stock on an interim basis while the Council develops long term management measures through the normal rulemaking process. The vote was 13 in favor and 4 opposed (including all three North Carolina members).

The Mid Atlantic Council's emergency action request prevents an unregulated fishery from continuing, but it also creates considerable management disparity between the councils' jurisdictions. Although these measures would essentially end the directed commercial fishery for blueline tilefish, the recreational bag limit of 7 fish per person still allows the directed recreational fishery to continue. This bag limit is higher than what was previously in place for the South Atlantic Fishery Management Council's jurisdiction (North Carolina to Florida), and this limit could result in catches greater than the 100-pound commercial trip limit currently in place in the South Atlantic. The current stock assessment, despite limited data, was approved by the review panel as a coastwide assessment and by the SAFMC Scientific and Statistical Committee as best available science for use in management. The South Atlantic Fishery Management Council implemented management measures to end overfishing that were based on

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the stock assessment's results. In order for geographic parity to occur, either both Councils should apply management measures based on the stock assessment or neither Council should.

UPCOMING MEETING

The next meeting of the Mid-Atlantic Fishery Management Council will be April 14-16, 2015 at the Ocean Place Resort in Long Branch, NJ.



North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

Donald R. van der Vaart
Secretary

MEMORANDUM

TO: Louis Daniel
Sammy Corbett

FROM: Chris Batsavage, Protected Resources Section Chief/Special Assistant for
Councils
Division of Marine Fisheries, NCDENR

DATE: April 27, 2015

SUBJECT: Mid-Atlantic Fishery Management Council Meeting— April 14-16, 2015

The Mid-Atlantic Fishery Management Council (Council) met on April 14-16, 2015 in Long Branch, NJ. Management actions taken by the Council are discussed below.

BLUELINE TILEFISH

The Council voted to develop long-term management measures for blueline tilefish in the Mid-Atlantic region (New York-Virginia). This follows up the Council's request to National Marine Fisheries Service for emergency rules to restrict commercial and recreational landings of blueline tilefish. Virginia and Maryland have regulations in place, but there are currently no federal regulations for the stock in the Mid-Atlantic. If NMFS approves emergency rules, they are in place for 180 days with an option for an additional 180 days. No management measures for blueline tilefish will exist in the Mid-Atlantic's federal waters after the emergency rules expire unless the Council takes action to develop long-term management.

The Council discussed different management options such as adding blueline tilefish to the Council's Golden Tilefish Fishery Management Plan, developing a separate fishery management plan for blueline tilefish, and developing a fishery management plan for deepwater complex species in the region (blueline tilefish, snowy grouper, wreckfish, blackbelly rosefish). It was pointed out that the South Atlantic Fishery Management Council also has a pending emergency action request to NMFS that is contingent on their Science and Statistical Committee's review of the stock assessment. If the Science and Statistical Committee determines the stock assessment is appropriate for coastwide management (New England-Florida), then the South Atlantic Fishery Management Council will request the National Marine Fisheries Service (via Emergency Action) implement existing regulations for blueline tilefish in the South Atlantic throughout the range of the species. Despite the uncertain outcome of the Science and Statistical Committee's review of the stock assessment, the Council needs to develop a plan for after the expiration of the emergency action.

The Council will hold scoping hearings to gather public input before deciding whether to develop an amendment or a new fishery management plan. A scoping hearing will likely be held in North Carolina to give North Carolina fishermen who fished for blueline tilefish in the Mid-Atlantic region an opportunity to provide input. The meetings are tentatively scheduled for June.

UPCOMING MEETING

The next regularly scheduled meeting of the Mid-Atlantic Fishery Management Council will be June 8-11, 2015 at the Hilton Virginia Beach Oceanfront in Virginia Beach, VA.



PRESS RELEASE

FOR IMMEDIATE RELEASE
April 15, 2015

PRESS CONTACT: Mary Clark
(302) 674-2331 (ext. 261)

Council Initiates Action to Manage Blueline Tilefish

Long Branch, NJ—Today the Mid-Atlantic Fishery Management Council voted to move forward with development of measures for the long-term management of blueline tilefish in the Mid-Atlantic. The Council will consider several approaches, including creation of a new fishery management plan (FMP) and development of an amendment to add blueline tilefish to the existing Golden Tilefish FMP.

This decision follows the Council's request earlier this year for an emergency rule to restrict commercial and recreational catch of blueline tilefish in the Mid-Atlantic. The Council recommended emergency action given recent evidence that commercial and recreational landings of blueline tilefish in the Mid-Atlantic are increasing rapidly and the species' biological characteristics make it highly susceptible to depletion. Regulations have been established in the South Atlantic to restrict commercial and recreational landings of the fish, and the states of Virginia and Maryland have regulations in place, but there are currently no federal regulations for the stock in the Mid-Atlantic.

In February, the Council requested an emergency rule to include a 300 pound commercial catch limit and a seven fish per-person recreational trip limit. If approved by NMFS, it will remain in place for 180 days and can be extended for an additional 180 days. Management measures beyond 360 days for blueline tilefish north of the North Carolina/Virginia border will require a separate action by the Council.

The Council discussed the advantages and disadvantages of different long-term management approaches during its meeting this week in Long Branch, New Jersey. One option is for the Council to develop a new FMP for blueline tilefish and possibly for other species in the deepwater complex such as blackbelly rosefish, wreckfish, and snowy grouper. Another option is to add blueline tilefish to the existing FMP for golden tilefish.

During the Council's discussion, Regional Administrator John Bullard stated that the "development of a new FMP is going to take more than a year, and we need to plan for what will happen when the emergency rule expires. In order for NMFS to implement an interim rule at that point, the Council should be well on the way to addressing this issue."

After extensive discussion, the Council decided to gather public input during scoping hearings before deciding whether to develop an amendment or a new FMP. Information about the scoping process for this action will be posted on the Council's website at www.mafmc.org in the coming weeks.



North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

Donald R. van der Vaart
Secretary

MEMORANDUM

TO: Sammy Corbett, Marine Fisheries Commission Chairman
Dr. Louis B. Daniel III, Director, Division of Marine Fisheries

FROM: Michelle Duval

DATE: April 30, 2015

SUBJECT: South Atlantic Fishery Management Council Meeting (March 2-6, 2015)

The South Atlantic Fishery Management Council (Council) met in St Simons Island, Georgia. Following is a summary of actions taken by the Council. The next meeting will be held in Key West, Florida, June 8-12, 2015.

Snapper Grouper Visioning Workshop

The Council continued its work developing a vision for the future of the snapper grouper fishery. The initial drafts of the blueprints for the “Science” and “Governance” strategic goals were reviewed, as well as updated blueprints for the “Management” and “Communication” strategic goals. The Council also reviewed a gap analysis conducted by staff that highlighted issues brought up at the visioning port meetings, but not specifically addressed in the draft blueprints and discussed inclusion of several additional strategies. Finally, the council discussed public input strategies including webinars on each strategic management goal, remote listening/comment stations and in-person public meetings. The Council is expected to approve a complete draft blueprint of all four goals for public input at its June 2015 meeting.

Ecosystem/Habitat Committee

The Council approved a revised policy statement on beach dredge and fill activities as part of the Fishery Ecosystem Plan II revision. It also received a number of presentations regarding ecosystem-based fishery management, including the National Oceanic and Atmospheric Administration’s vision and activities supporting this topic as well as the agency’s draft Climate Science Strategy. Additional presentations from the South Atlantic Landscape Conservation Cooperative regarding its Conservation Blueprint, and the Bureau of Ocean Energy Management concerning its offshore energy program as well as the agency’s “five-year” plan for oil and gas exploration activities.

Southeast Data, Assessment, and Review (SEDAR) Committee

This is the name of the stock assessment process in the southeast, and each Southeast, Data, Assessment and Review, or “SEDAR” is given a number. The Council received updates on the following stock assessment activities:

- *SEDAR 41 (gray triggerfish and red snapper)*: This assessment is scheduled to resume in August 2015, one year after it was halted due to concerns regarding the accuracy of headboat reporting from north Florida. A two-pronged approach was taken to resolve the issue: a programmatic review of survey procedures and changes that occurred over the lifetime of the survey and an analytical examination of logbooks, dockside sampling and observer program data.
- An update to the red grouper assessment is scheduled to occur in 2015. Many fishermen, particularly in North Carolina have expressed concern regarding the status of red grouper. Blueline tilefish is currently scheduled for an update in 2016, due to concerns regarding the data limitations of the assessment.

Protected Resources Committee

The committee received an update on the Atlantic sturgeon Section 7 consultation for the Coastal Migratory Pelagics fishery (mackerels, cobia), which should be completed by June 2015. The committee received a presentation from the

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National Marine Fisheries Service regarding the proposed revisions to the critical habitat area designation for the North Atlantic right whale. The existing designation covers an area parallel to the coast beginning just below Cape Canaveral, Florida (extending five miles out from shore) and running halfway up the Georgia coast (where it extends 15 miles out from shore). The proposed critical habitat begins just north of Cape Canaveral and extends up through Cape Fear offshore to depths of 20-30 meters. The Council also received a presentation on the recent policy guidance to improve integration of federal councils in the ESA consultation process and reviewed a list of items for inclusion in a regional agreement between the Council and the National Marine Fisheries Service.

Snapper Grouper Committee

The committee received updates on the status of the following amendments under review:

- Amendment 29 (Only Reliable Catch Stocks and gray triggerfish): The proposed rule published Dec. 7, 2014 with comments due by Jan. 7, 2015. The amendment updates the Council's Allowable Biological Catch control rule to include the use of a data-limited approach, establishes a minimum size limit for gray triggerfish (12 inches fork length), a commercial split season and a commercial trip limit of 1,000 pounds. The final rule is expected to publish soon.
- Amendment 32 (blueline tilefish): The final rule published and was effective on March 30, 2015. This establishes vastly reduced annual catch limits, a 100-pound commercial trip limit and a one-fish per vessel daily recreational bag limit (harvest allowed only May through August). The commercial fishery was subsequently closed on April 7 due to the annual catch limit being met.
- Regulatory Amendment 20 (snowy grouper): The proposed rule for this amendment published April 8, 2015 with comments due by May 8, 2015. It would increase the annual catch limit for snowy grouper, increase the commercial trip limit from 100 to 200 pounds (gutted weight), maintain the existing one fish per vessel per day recreational bag limit and restrict harvest to May through August.
- Comprehensive Accountability Measures/Dolphin-Wahoo Amendment 8: This amendment would standardize the Council's accountability measures across its managed species. It also establishes a 10 percent commercial/90 percent recreational allocation of the Annual Catch Limit for dolphin. The proposed rule is under review.
- Snapper Grouper Amendment 33/Dolphin-Wahoo Amendment 7: This amendment extends an exemption currently allowed in the snapper grouper fishery to the dolphin-wahoo fishery that allows fish legally harvested in the Bahamas to be transported aboard a recreational fishing vessel as fillets. It also closes loopholes in the existing snapper grouper exemption and establishes consistent rules across both fisheries. The amendment is under review in the region.

Regulatory Amendment 16 (black sea bass pot closure): This amendment contains a range of alternatives to modify the existing November through April prohibition on the use of black sea bass pots due to concerns regarding risk to right whales. The Council was required to implement this closure in late 2013 in order to double the annual catch limit based on a stock assessment update. The Council received an update on the comments made by the Atlantic Large Whale Take Reduction Team on the amendment and proposed alternatives. There were mixed opinions on the alternatives, but support for the actions regarding additional gear marking specific to this fishery, and it was noted that the small number of participants lent itself well to different cooperative management approaches.

The Council selected a preferred alternative (Alternative 9, Sub-Alternative 9a) that would maintain a prohibition on the use of black sea bass pot gear inshore of 20 meters depth off the Carolinas, and the area that encompasses the 75th percentile of sightings off Georgia and Florida, annually from Nov. 1 through April 15. This alternative was supported by most sea bass pot fishermen and seen as more proactive than other alternatives. The selection of a preferred alternative triggers the development of a new Biological Opinion for the snapper grouper fishery, which is expected to be completed by the time the Council takes final action on this amendment in September. The Council is scheduled to approve the amendment for August public hearings at its June meeting.

Amendment 22 (recreational harvest tags): This amendment would establish a systems to distribute tags to track recreational harvest of species with very low annual catch limits that the Marine Recreational Information Program was not designed to capture. The Council voted to halt development of this amendment until further notice and to request presentations from MRIP staff at the June council meeting regarding strategies to better track species with low annual catch limits and rarely intercepted species.

Amendment 35 (removal of species and golden tilefish endorsements): This amendment contains actions to remove species from the fishery that are primarily caught in south Florida (black snapper, mahogany snapper, dog snapper and schoolmaster snapper), and address a loophole in the golden tilefish longline endorsement that has allowed endorsement holders to fish on the 25 percent of the annual catch limit set aside for hook-and-line fishermen that did not receive endorsements. The Council reviewed public input and will approve the amendment for secretarial review in June.

Amendment 36 (spawning Special Management Zones (SMZs)): The Council reviewed modifications to the sizes of the candidate spawning Special Management Zones, based on bottom topography and species occurrence, that were requested at its December meeting. This amendment is the alternative to the 240 foot deepwater closure that was implemented in Amendment 17B, and subsequently removed (based on data collected by N.C. fishermen and Division staff) in Regulatory Amendment 11. A workshop was held in conjunction with the Snapper Grouper Advisory Panel Meeting on April 13, 2015 to solicit public input on the candidate sites. A series of remote “listening station” webinars were also conducted in the week of April 20 to allow for discussion and input from fishermen in each of the four states. The Council will review the draft amendment and likely select preferred alternatives for public comment in June 2015.

Amendment 37 (hogfish and various species): This amendment contains actions related to hogfish, in response to the recent stock assessment, as well as suite of small actions related to other species including: consideration of an increase in the recreational bag limit for black sea bass; disaggregation of the jacks complex (lesser amberjack, almaco jack, banded rudderfish); removal of outdated size limits for several deepwater species (blackfin snapper, queen snapper, silk snapper); modification of the shallow water grouper spawning season closure; and a potential modification to the minimum size limit for red grouper. The council will review a draft of this amendment and provide input regarding actions and alternatives to develop for further analysis.

Blueline tilefish management: The week after the Council’s December 2014 meeting, the Mid-Atlantic Fishery Management Council met and discussed significant increases in commercial landings of blueline tilefish that occurred in New Jersey that were approximately equivalent to the entire emergency annual catch limit in the South Atlantic (over 200,000 pounds; previously landings were only several thousand pounds annually). Subsequently, similar increases in charter and headboat landings were also discovered. The Mid-Atlantic Council held an emergency webinar on Feb. 25, 2015 to request emergency action to implement regulations similar to those in Virginia and Maryland state waters throughout the council’s jurisdiction, namely a 300 pound commercial trip limit and a seven-fish recreational bag limit.

The blueline tilefish stock assessment conducted through SEDAR 32 determined that the population was a single coastwide stock, and incorporated all harvest coastwide through 2011; therefore the total allowable biological catch applies to both the South Atlantic and Mid-Atlantic jurisdictions. However, the South Atlantic Council has no jurisdiction in the Mid-Atlantic for snapper grouper species, and the Mid-Atlantic Council has no fishery management plan or other regulations in place for these species. Because the landings from the Mid-Atlantic prior to 2014 averaged only two percent of coastwide landings, the South Atlantic Council established an annual catch limit in its jurisdiction that left this amount of catch (approximately 2,000 pounds) available for harvest in other jurisdictions. The commercial and recreational landings in the Mid-Atlantic vastly exceeded this.

The Mid-Atlantic Council has suggested that the blueline tilefish assessment should not apply in their area, based on the recent landings from 2014, while the South Atlantic Council has stated there needs to be parity in the geographic application of the results of the assessment. The South Atlantic Council voted to request that its Science and Statistical Committee determine the geographic range to which the results of the assessment should apply; if warranted, the Council would then request emergency action to extend the management measures in Amendment 32 through the Mid-Atlantic Council’s jurisdiction. The Science and Statistical Committee met April 28-30, 2015 and determined that, while the stock assessment suffered from data limitations, it was still applicable coastwide and blueline tilefish appear to be a single population currently. However, it is likely that the Council will be formally requesting the Committee to review its previous catch level recommendations given various changes in landings patterns since the catch projections were completed.

Mackerel Committee

Amendment 26 (king mackerel annual catch limits and stock boundary): This amendment would adjust the king mackerel annual catch limits based on the SEDAR 38 stock assessment. It includes actions to adjust the boundary between Gulf and South Atlantic stocks; allow for sale of king mackerel incidentally caught in the shark gill net fishery; and considers a

separate quota for the mixing zone between the Gulf and South Atlantic stocks (the area off the Florida Keys). Scoping comments were reviewed, and an action was added to maintain the Florida east coast sub-zone, which has its own series of commercial trip limit adjustments based on the amount of the annual catch limit that has been harvested. The Council will approve the document for formal public comment in June.

Amendment 28 (separation of permits/separation of management plan): This amendment would consider separation of commercial permits as part of establishing its own fishery management plan. Currently, the species in the plan are managed jointly with the Gulf of Mexico Fishery Management Council and each council must approve the others actions. This amendment was taken out for scoping, but the Council voted to discontinue work on this amendment based on discussions at the Gulf Council January 2015 meeting, but requested that staff prepare a document outlining the pros and cons of separating management.

Data Collection Committee

Status of Bycatch Reporting in the Southeast: A workgroup comprised of staff from the National Marine Fisheries Service Regional Office and Southeast Fisheries Science Center has been formed to address the status of bycatch reporting in the southeast. The workgroup is currently documenting all bycatch methods used in the fifteen fishery management plans in the southeast, with the goal of developing recommendations for improvements and a standardized bycatch reporting methodology.

Electronic Technology Implementation Plan: The final Electronic Technologies Implementation Plan for the Southeast Region was approved and almost all Council recommendations were incorporated. The plan can be found here: http://sero.nmfs.noaa.gov/sustainable_fisheries/documents/pdfs/em_er_implementation_plan_southeast.pdf.

Commercial Electronic Reporting: The Council received an update on the development of an electronic version of the existing commercial logbook form that fishermen could voluntarily use to submit catch information. The Atlantic Coastal Cooperative Statistics Program is working with the Southeast Fisheries Science Center to implement this product. The form should be operational by late summer 2015. Additionally, the Council received an update on the status of the commercial electronic logbook pilot program. Fishermen throughout the region have been selected for pilot testing of a variety of platforms (tablet computers, onboard laptops, etc.) and training sessions have been scheduled throughout the region.

Joint Gulf/South Atlantic Charterboat Electronic Reporting: The Council reviewed a list of draft actions for this amendment, which closely mirror the changes made to require weekly electronic reporting by headboats. A range of actions and alternatives were approved, and the Council clarified that it was not interested in the use of Vessel Monitoring Systems to record catch location. The Council will review updated actions and alternatives and is scheduled to approve the amendment for public comment in June.

N.C. Marine Fisheries Commission Rule Suspension Update- As of April. 29, 2015

(In accordance with N.C. Division of Marine Fisheries Resource Management Policy 2014-2)

No new rule suspensions have occurred since the commission's February 2015 meeting.

Continuing Suspensions

The following rule suspensions have been approved on a continuing basis by the commission and no further action is required:

- **The following portion of N.C. Marine Fisheries Commission Rule 15A NCAC 03J .0103 GILL NETS, SEINES, IDENTIFICATION, RESTRICTIONS is suspended:**
Section (i) (1), which reads:
 - (i) For gill nets with a mesh length five inches or greater, it is unlawful:
 - (1) To use more than 3,000 yards of gill net per vessel in internal waters regardless of the number of individuals involved.

Suspension of portions of this rule allows the division to decrease the total yardage of gill nets with a mesh length five inches or greater in order to manage the gill net fishery in accordance with the Federal Incidental Take Permits (ITPs) for sea turtles and Atlantic sturgeon. This rule has been approved to be suspended indefinitely.

- **The following portion of N.C. Marine Fisheries Commission Rule 15A NCAC 03M .0519 SHAD is suspended:**
Paragraphs (a) and (b) which read:
 - (a) It is unlawful to take American shad and hickory shad by any method except hook-and-line from April 15 through December 31.
 - (b) It is unlawful to possess more than 10 American shad or hickory shad, in the aggregate, per person per day taken by hook-and-line or for recreational purposes.
- **The following portion of N.C. Marine Fisheries Commission Rule 15A NCAC 03Q .0107 SPECIAL REGULATIONS: JOINT WATERS is suspended:**
Paragraph (4) which reads:
 - (4) Shad: It is unlawful to possess more than 10 American shad or hickory shad, in the aggregate per person per day taken by hook-and-line.

Suspension of portions of these rules allows the division to change the season and creel limit of American shad under the management framework of the N.C. American Shad Sustainable Fishery Plan. These rules have been approved to be suspended indefinitely.

Suspensions to a Date Certain

The following rule suspensions were approved to a date certain by the commission, but are no longer in effect. No action is required.

- **The following portion of N.C. Marine Fisheries Commission Rule 15A NCAC 03O .0501 PROCEDURES AND REQUIREMENTS TO OBTAIN PERMITS was suspended:**
Section (f) (1) is modified by the suspension of the following wording: "prior to November 1 of".

Suspension of portions of this rule allowed the division to remove the November 1 requirement for obtaining an Atlantic Ocean Striped Bass Commercial Gear Permit which would allow

fishermen additional time to decide which gear they want to declare. This rule suspension approval was to the effective date of the most recent rule package: May 1, 2015.

Proclamation M-43-2014 that suspended the above rule has been rescinded, effective May 1, 2015.

➤ **N.C. Marine Fisheries Commission Rule 15A NCAC 03M .0510 AMERICAN EEL was suspended in its entirety:**

It is unlawful to:

- (1) Possess, sell or take eels less than six inches in length; and
- (2) Possess more than 50 eels per person per day for recreational purposes.

Suspension of this rule allowed the division to reduce the size and harvest limits of American eel in compliance with Addendum III to the Atlantic States Marine Fisheries Commission American Eel Fishery Management Plan. This rule suspension approval was to the effective date of the most recent rule package: May 1, 2015.

Proclamation FF-71-2014 that suspended the above rule has been rescinded, effective May 1, 2015.

N.C. Division of Marine Fisheries Resource Management Policy Number 2014-2

Title: Temporary Rule Suspension [Efficient Process for Implementation of G.S. 143B-289.52 and Rule 15A NCAC 03I .0102 ¹]

Date: Nov. 4, 2014

Background:

The rule for temporary suspension of rules (Appendix A) requires that, when the Division of Marine Fisheries (“DMF” or “Division”) Director implements a temporary rule suspension by proclamation, that the Marine Fisheries Commission (“MFC” or “Commission”) receive notification of the suspension at the next meeting following rule suspension. This notification alerts the MFC of the temporary rule suspension, provides them with information about the reason for the suspension, and allows them to take appropriate action at that meeting. In practice, DMF has put every² rule suspension to the MFC as an agenda item at every meeting subsequent to the first suspension, and asked the MFC to vote on continuing suspension. Following every meeting, DMF goes through the notification process of the continued suspension (including drafting a new proclamation, posting it on the web site, and distributing it via email and U.S. mail.) This process has become burdensome to both the Division and the Commission, taking meeting time and causing significant additional staff time and expense.

Policy for Temporary Suspension of Rules by the Director and Notification of the Marine Fisheries Commission of Such Suspension:

Going forward, when a rule suspension is first presented to the MFC, assuming the MFC agrees with the suspension, the MFC will be asked to vote on whether to delegate to the Director the authority to suspend the rule (a) indefinitely (continuing suspensions), (b) for a fixed time period (suspensions to a date certain) or (c) until external conditions/triggers occur (indefinite suspensions until trigger events or conditions.) Following that initial vote, the MFC will be kept informed as follows:

Continuing Suspensions will be reported by inclusion as a non-action, non-discussion informational item at every meeting by providing a copy of the suspensions in every MFC briefing book and will reference that inclusion by notation on the agenda. In addition, the Division will provide verbal reminder and specific agenda reference of all current rule suspensions annually at every November meeting of the Commission.

Suspensions to a Date Certain will be reversed by proclamation effective on the date certain and, while in effect, will be reported to the Commission as if it were a continuing suspension. The Division will report the end of the suspension as an agenda item at the next MFC meeting following that date certain.

¹ Legal authorities include N.C. Gen. Stat. §§ 143B-289.52 & 113-221.1, and 15A NCAC 03I .0102, TEMPORARY SUSPENSION OF RULES, 15A NCAC 03H .0103, PROCLAMATION AUTHORITY OF FISHERIES DIRECTOR. (See Appendix A)

² The division has put every rule suspension to the MFC as an agenda item at every meeting subsequent to the first suspension except for those rule suspensions otherwise exempted from this requirement as stated in other MFC rules. Note that certain rules such as 15A NCAC 03J .0301(k) (proposed for adoption as 03I .0122 in 2015) and 15A NCAC 03K .0110 provide exemptions to the review requirement.

Indefinite Suspensions until Trigger Events or Conditions will be continued until the triggering event/condition occurs and will be reported to the Commission while ongoing as if it were a continuing suspension. The Division will report the change in conditions/tripping of a trigger as an agenda item at the next MFC meeting following the occurrence of the condition/trigger.

This policy will not prohibit reconsideration of a prior rule suspension in accordance with G.S. 113-221.1 (d), it will simply eliminate the additional time and effort where continuing suspensions are agreed upon. New Commissioners will receive a copy of this policy, along with a copy of all current rule suspensions at the time that they join the Commission so that they will have specific notice that these rule suspensions are in effect. New suspensions will continue to be presented to the Commission at its next meeting following the initial suspension.

Appendix A

15A NCAC 03H .0103 PROCLAMATION AUTHORITY OF FISHERIES DIRECTOR

(a) It is unlawful to violate the provisions of any proclamation issued by the authority of Marine Fisheries Commission Rule.

(b) Unless specific variable conditions are set forth in a rule granting proclamation authority to the Fisheries Director, variable conditions triggering the use of the Fisheries Director's proclamation authority may include any of the following:

- (1) compliance with changes mandated by the Fisheries Reform Act and its amendments;
- (2) biological impacts;
- (3) environmental conditions;
- (4) compliance with Fishery Management Plans;
- (5) user conflicts;
- (6) bycatch issues; and
- (7) variable spatial distributions.

History Note: Authority G.S. 113-134; 113-135; 113-182; 113-221.1; 143B-289.52;
Eff. January 1, 1991;
Amended Eff. March 1, 1994; September 1, 1991;
Temporary Amendment Eff. July 1, 1999;
Amended Eff. April 1, 2011; August 1, 2000.

15A NCAC 03I .0102 TEMPORARY SUSPENSION OF RULES

The Fisheries Director is authorized to suspend, in whole or in part, until the next meeting of the Marine Fisheries Commission, or for a lesser period, the operation of any rule of the Marine Fisheries Commission regarding coastal fisheries which may be affected by variable conditions.

History Note: Authority G.S. 113-134; 143B-289.52;
Eff. January 1, 1991;
Recodified from 15A NCAC 3I .0002 Eff. December 17, 1996.

§ 113-221.1. Proclamations; emergency review.

(a) Chapter 150B of the General Statutes does not apply to proclamations issued under this Article.

(b) The Marine Fisheries Commission may delegate to the Fisheries Director the authority to issue proclamations suspending or implementing, in whole or in part, particular rules of the Commission that may be affected by variable conditions. These proclamations shall be issued by the Fisheries Director or by a person designated by the Fisheries Director. Except as provided in this subsection, all proclamations shall state the hour and date upon which they become effective and shall be issued at least 48 hours in advance of the effective date and time. A proclamation that prohibits the taking of certain fisheries resources for reasons of public health or that governs a quota-managed fishery may be made effective immediately upon issuance. A proclamation to reopen the taking of certain fisheries resources closed for reasons of public health shall be issued at least 12 hours in advance of the effective date and time of the reopening. A person who violates a proclamation that is made effective immediately upon issuance shall not be charged with a criminal offense for the violation if the violation occurred between the time of issuance and 48 hours after the issuance and the person did not have actual notice of the issuance of the proclamation. Fisheries resources taken or possessed by any person in violation of any proclamation may be seized regardless of whether the person had actual notice of the proclamation. A permanent file of the text of all proclamations shall be maintained in the office of the Fisheries Director. Certified copies of proclamations are entitled to judicial notice in any civil or criminal proceeding. The Fisheries Director shall make every reasonable effort to give actual notice of the terms of any proclamation to persons who may be affected by the proclamation. Reasonable effort includes a press release to communications media, posting of a notice at docks and other places where persons affected may gather, personal communication by inspectors and other agents of the Fisheries Director, and other measures designed to reach the persons who may be affected. It is a defense to an enforcement action for a violation of a proclamation that a person was prevented from receiving notice of the proclamation due to a natural disaster or other act of God occasioned exclusively by violence of nature without interference of any human agency and that could not have been prevented or avoided by the exercise of due care or foresight.

(c) All persons who may be affected by proclamations issued by the Fisheries Director are under a duty to keep themselves informed of current proclamations. It is no defense in any criminal prosecution for the defendant to show that the defendant in fact received no notice of a particular proclamation. In any prosecution for violation of a proclamation, or in which proof of matter contained in a proclamation is involved, the Department is deemed to have complied with publication procedures; and the burden is on the defendant to show, by the greater weight of the evidence, substantial failure of compliance by the Department with the required publication procedures.

(d) Pursuant to the request of five or more members of the Marine Fisheries Commission, the Chair of the Marine Fisheries Commission may call an emergency meeting of the Commission to review an issuance or proposed issuance of proclamations under the authority delegated to the Fisheries Director pursuant to subsection (b) of this section or to review the desirability of directing the Fisheries Director to issue a proclamation to prohibit or allow the taking of certain fisheries resources. At least 48 hours prior to any emergency meeting called pursuant to this subsection, a public announcement of the meeting shall be issued that describes the action requested by the members of the Marine Fisheries Commission. The Department shall make every reasonable effort to give actual notice of the meeting to persons who may be affected. After its review is complete, the Marine Fisheries Commission, consistent with its duty to protect, preserve, and enhance the commercial and sports fisheries resources of the State, may approve, cancel, or modify the previously issued or proposed proclamation under review or may direct the Fisheries Director to issue a proclamation that prohibits or allows the taking of certain fisheries resources. An emergency meeting called pursuant to this subsection and any resulting orders issued by the Marine Fisheries Commission are exempt from the provisions of Article 2A of Chapter 150B of the General Statutes. The decisions of the Marine Fisheries Commission shall be the final decision of the State and shall not be set aside on judicial review unless found to be arbitrary and capricious. (1915, c. 84, s. 21; 1917, c. 290, s. 7; C.S., s. 1878; 1925, c. 168, s. 2; 1935, c. 35; 1945, c. 776; 1953, cc. 774, 1134, 1251; 1963, c. 1097, s. 1; 1965, c. 957, s. 2; 1973, c. 1262, ss. 28, 86; c. 1331, s. 3; 1975, 2nd Sess., c. 983, s. 70; 1979, c. 388, s. 6; 1983, cc. 221, 619, 620; 1987, c. 641, ss. 7, 19; c. 827, s. 7; 1997-400, s. 4.3; 1998-225, s. 3.8; 2000-189, s. 9; 2003-154, s. 2.)

§ 143B-289.52. Marine Fisheries Commission - powers and duties.

(a) The Marine Fisheries Commission shall adopt rules to be followed in the management, protection, preservation, and enhancement of the marine and estuarine resources within its jurisdiction, as described in G.S. 113-132, including commercial and sports fisheries resources. The Marine Fisheries Commission shall have the power and duty:

- (1) To authorize, license, regulate, prohibit, prescribe, or restrict all forms of marine and estuarine resources in coastal fishing waters with respect to:
 - a. Time, place, character, or dimensions of any methods or equipment that may be employed in taking fish.
 - b. Seasons for taking fish.
 - c. Size limits on and maximum quantities of fish that may be taken, possessed, bailed to another, transported, bought, sold, or given away.
- (2) To provide fair regulation of commercial and recreational fishing groups in the interest of the public.
- (3) To adopt rules and take all steps necessary to develop and improve mariculture, including the cultivation, harvesting, and marketing of shellfish and other marine resources in the State, involving the use of public grounds and private beds as provided in G.S. 113-201.
- (4) To close areas of public bottoms under coastal fishing waters for such time as may be necessary in any program of propagation of shellfish as provided in G.S. 113-204.
- (5) In the interest of conservation of the marine and estuarine resources of the State, to institute an action in the superior court to contest the claim of title or claimed right of fishery in any navigable waters of the State registered with the Department as provided in G.S. 113-206(d).
- (6) To make reciprocal agreements with other jurisdictions respecting any of the matters governed in this Subchapter as provided by G.S. 113-223.
- (7) To adopt relevant provisions of federal laws and regulations as State rules pursuant to G.S. 113-228.
- (8) To delegate to the Fisheries Director the authority by proclamation to suspend or implement, in whole or in part, a particular rule of the Commission that may be affected by variable conditions as provided in G.S. 113-221.1.
- (9) To comment on and otherwise participate in the determination of permit applications received by State agencies that may have an effect on the marine and estuarine resources of the State.

- (10) To adopt Fishery Management Plans as provided in G.S. 113-182.1, to establish a Priority List to determine the order in which Fishery Management Plans are developed, to establish a Schedule for the development and adoption of each Fishery Management Plan, and to establish guidance criteria as to the contents of Fishery Management Plans.
 - (11) To approve Coastal Habitat Protection Plans as provided in G.S. 143B-279.8.
 - (12) Except as may otherwise be provided, to make the final agency decision in all contested cases involving matters within the jurisdiction of the Commission.
 - (13) To adopt rules to define fishing gear as either recreational gear or commercial gear.
- (b) The Marine Fisheries Commission shall have the power and duty to establish standards and adopt rules:
- (1) To implement the provisions of Subchapter IV of Chapter 113 as provided in G.S. 113-134.
 - (2) To manage the disposition of confiscated property as set forth in G.S. 113-137.
 - (3) To govern all license requirements prescribed in Article 14A of Chapter 113 of the General Statutes.
 - (4) To regulate the importation and exportation of fish, and equipment that may be used in taking or processing fish, as necessary to enhance the conservation of marine and estuarine resources of the State as provided in G.S. 113-170.
 - (5) To regulate the possession, transportation, and disposition of seafood, as provided in G.S. 113-170.4.
 - (6) To regulate the disposition of the young of edible fish, as provided by G.S. 113-185.
 - (7) To manage the leasing of public grounds for mariculture, including oysters and clam production, as provided in G.S. 113-202.
 - (8) To govern the utilization of private fisheries, as provided in G.S. 113-205.
 - (9) To impose further restrictions upon the throwing of fish offal in any coastal fishing waters, as provided in G.S. 113-265.
 - (10) To regulate the location and utilization of artificial reefs in coastal waters.
 - (11) To regulate the placement of nets and other sports or commercial fishing apparatus in coastal fishing waters with regard to navigational or recreational safety as well as from a conservation standpoint.
- (c) The Commission is authorized to authorize, license, prohibit, prescribe, or restrict:
- (1) The opening and closing of coastal fishing waters, except as to inland game fish, whether entirely or only as to the taking of particular classes of fish, use of particular equipment, or as to other activities.
 - (2) The possession, cultivation, transportation, importation, exportation, sale, purchase, acquisition, and disposition of all marine and estuarine resources and all related equipment, implements, vessels, and conveyances as necessary to carry out its duties.
- (d) The Commission may adopt rules required by the federal government for grants-in-aid for coastal resource purposes that may be made available to the State by the federal government. This section is to be liberally construed in order that the State and its citizens may benefit from federal grants-in-aid.
- (d1) The Commission may regulate participation in a fishery that is subject to a federal fishery management plan if that plan imposes a quota on the State for the harvest or landing of fish in the fishery. The Commission may use any additional criteria aside from holding a Standard Commercial Fishing License to develop limited-entry fisheries. The Commission may establish a fee for each license established pursuant to this subsection in an amount that does not exceed five hundred dollars (\$500.00).
- (d2) To ensure an orderly transition from one permit year to the next, the Division may issue a permit prior to July 1 of the permit year for which the permit is valid. Revenue that the Division receives for the issuance of a permit prior to the beginning of a permit year shall not revert at the end of the fiscal year in which the revenue is received and shall be credited and available to the Division for the permit year in which the permit is valid.
- (e) The Commission may adopt rules to implement or comply with a fishery management plan adopted by the Atlantic States Marine Fisheries Commission or adopted by the United States Secretary of Commerce pursuant to the Magnuson-Stevens Fishery Conservation and Management Act, 16 U.S.C. § 1801, et seq. Notwithstanding G.S. 150B-21.1(a), the Commission may adopt temporary rules under this subsection at any time within six months of the adoption or amendment of a fishery management plan or the notification of a change in management measures needed to remain in compliance with a fishery management plan.
- (e1) A supermajority of the Commission shall be six members. A supermajority shall be necessary to override recommendations from the Division of Marine Fisheries regarding measures needed to end overfishing or to rebuild overfished stocks.

(f) The Commission shall adopt rules as provided in this Chapter. All rules adopted by the Commission shall be enforced by the Department of Environment and Natural Resources.

(g) As a quasi-judicial agency, the Commission, in accordance with Article IV, Section 3 of the Constitution of North Carolina, has those judicial powers reasonably necessary to accomplish the purposes for which it was created.

(h) Social security numbers and identifying information obtained by the Commission or the Division of Marine Fisheries shall be treated as provided in G.S. 132-1.10. For purposes of this subsection, "identifying information" also includes a person's mailing address, residence address, date of birth, and telephone number.

(i) The Commission may adopt rules to exempt individuals who participate in organized fishing events held in coastal or joint fishing waters from recreational fishing license requirements for the specified time and place of the event when the purpose of the event is consistent with the conservation objectives of the Commission. (1997-400, ss. 2.1, 2.2; 1997-443, s. 11A.123; 1998-217, s. 18(a); 1998-225, ss. 1.3, 1.4, 1.5; 2001-474, s. 32; 2003-154, s. 3; 2004-187, ss. 7, 8; 2006-255, ss. 11.2, 12; 2012-190, s. 5; 2012-200, s. 17; 2013-360, ss. 14.8(v), (w).)



North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

Donald R. van der Vaart
Secretary

MEMORANDUM

TO: Dr. Louis B. Daniel III, Division of Marine Fisheries Director
Sammy Corbett, Marine Fisheries Commission Chairman

FROM: Randy Gregory
Division of Marine Fisheries, NCDENR

DATE: May 1, 2015

SUBJECT: Highly Migratory Species Update

The Highly Migratory Species Advisory Panel's spring meeting was held March 10 - 12, 2015 in Bethesda, Maryland. The National Marine Fisheries Service Highly Migratory Species Fishery Management Division staff discussed the Draft Amendment 6 to the 2006 Consolidated Highly Migratory Species Fishery Management Plan on the future of shark fishery, provided updates on Amendment 5b on dusky shark management and SEADAR 39 smoothhound shark stock assessment, and an overview of final rules and implementation of Amendment 7 for bluefin tuna management measures. The meeting also included discussions of the National Recreational Fishing Policy, the Office of Sustainable Fisheries Strategic Plan, and the Highly Migratory Species Division's Electronic Technology Implementation Plan and Research Priorities.

Bluefin Tuna

National Marine Fisheries Service published the final rule to implement Amendment 7 on December 2, 2014. Final measures include the pelagic longline fishery Individual Bluefin Quotas, Cape Hatteras Pelagic Longline Gear Restricted Area, electronic monitoring via cameras and bluefin tuna catch reporting via Vessel Monitoring System (VMS) for longline vessels, and inseason adjustments of the General category time-period subquota allocations. For the 2015 fishing year, National Marine Fisheries Service transferred 21 metric tons forward from the General category December period to the January period resulting in a subquota of 42.4 metric tons. The January General category period ended March 31st with 31.3 metric tons landed.

Sharks

The Division submitted comments to the National Marine Fishery Service (NMFS) for a 90-day petition finding to list the common thresher shark as endangered or threatened under the U.S. Endangered Species Act. In North Carolina, common thresher sharks are caught incidentally, when fishing for other species in the pelagic longline and ocean gillnet fisheries. From 2009 to 2013, North Carolina landings averaged 64,700 pounds per year. In 2014, landings of common thresher sharks spiked to 178,826 pounds. Due to existing management regulations, lack of assessment data, conflicting trends of abundance, and the small contribution to the annual U.S. harvest from the Atlantic the Division requested that NMFS not list the common thresher shark until more information is available, especially in relation to the western Atlantic.

The Division submitted comments on the Draft Amendment 6 to the 2006 Consolidated Highly Migratory Species Fishery Management Plan on the future of shark fishery. The Division supports the preferred alternative C4, to establish an Atlantic regional commercial quota for the small coastal shark (SCS) management group along the 34° 00' N. Lat. into northern and southern sub-regional quotas and the removal of the SCS quota linkage to blacknose sharks in the northern sub-region. We propose removing the LCS management group from the sub-regional split and implementing semi-annual, seasonally split quotas for the entire Atlantic region; using January 1 and July 1 as opening dates. We encourage the National Marine Fisheries Service to consider increasing the federal fishery closure trigger for the shark management groups from 80% to greater than 90%. The implementation of weekly reporting requirements for dealers and electronic reporting requirements has improved quota monitoring abilities, increasing the timeliness and accuracy of dealer reporting. Additionally, the Division requests the sandbar and dusky shark stock assessments be completed as soon as possible. These stock assessments were completed in 2011 and since that time independent indices have been increasing and new information needs to be incorporated into the assessments.

Year	Month	Species	Pounds	Dealers	Trips	Average (2007-2009)	Conf
2013	1	SOUTHERN FLOUNDER	2,942	42	276	7,713	
2013	2	SOUTHERN FLOUNDER	896	37	254	4,617	
2013	3	SOUTHERN FLOUNDER	4,387	57	682	23,512	
2013	4	SOUTHERN FLOUNDER	16,697	93	1,177	68,389	
2013	5	SOUTHERN FLOUNDER	49,629	123	1,778	122,514	
2013	6	SOUTHERN FLOUNDER	79,203	137	2,127	154,090	
2013	7	SOUTHERN FLOUNDER	119,720	150	2,839	170,387	
2013	8	SOUTHERN FLOUNDER	124,177	147	2,685	201,862	
2013	9	SOUTHERN FLOUNDER	416,097	161	3,631	396,301	
2013	10	SOUTHERN FLOUNDER	883,476	172	5,512	781,717	
2013	11	SOUTHERN FLOUNDER	483,762	121	2,589	392,150	
2013	12	SOUTHERN FLOUNDER	5,288	12	27	37,303	
2014	1	SOUTHERN FLOUNDER	2,978	29	183	7,713	
2014	2	SOUTHERN FLOUNDER	1,823	29	285	4,617	
2014	3	SOUTHERN FLOUNDER	3,430	43	677	23,512	
2014	4	SOUTHERN FLOUNDER	18,997	71	933	68,389	
2014	5	SOUTHERN FLOUNDER	16,001	93	681	122,514	
2014	6	SOUTHERN FLOUNDER	80,129	123	1,985	154,090	
2014	7	SOUTHERN FLOUNDER	84,659	141	2,145	170,387	
2014	8	SOUTHERN FLOUNDER	105,208	137	2,204	201,862	
2014	9	SOUTHERN FLOUNDER	404,128	153	3,582	396,301	
2014	10	SOUTHERN FLOUNDER	634,510	146	3,433	781,717	
2014	11	SOUTHERN FLOUNDER	320,598	121	1,988	392,150	
2014	12	SOUTHERN FLOUNDER	800	5	7	37,303	
2015	1	SOUTHERN FLOUNDER	1,987	29	235	7,713	
2015	2	SOUTHERN FLOUNDER	494	20	92	4,617	
2015	3	SOUTHERN FLOUNDER	3,258	30	488	23,512	
2015	4	SOUTHERN FLOUNDER	1,137	5	40	68,389	

***2015 data are preliminary and only complete through February.

Red Drum Landings 2013-2015

Landings are complete through February 28, 2015

2014 landings are final; 2015 landings are preliminary

Year	Month	Species	Pounds	2009-2011 Average	2011-2013 Average
2013	9	Red Drum	65,273	28,991	30,735
2013	10	Red Drum	135,745	43,644	56,121
2013	11	Red Drum	61,658	14,318	25,338
2013	12	Red Drum	0	3,428	2,036
2014	1	Red Drum	***	5,885	2,755
2014	2	Red Drum	0	3,448	2,832
2014	3	Red Drum	0	5,699	2,425
2014	4	Red Drum	***	7,848	4,643
2014	5	Red Drum	0	13,730	7,687
2014	6	Red Drum	***	12,681	9,304
2014	7	Red Drum	0	13,777	13,152
2014	8	Red Drum	***	21,252	20,467

Fishing Year (Sept 1, 2013 - Aug 31, 2014) Landings 262,753

Year	Month	Species	Pounds	2009-2011 Average	2011-2013 Average
2014	9	Red Drum	34,749	28,991	30,735
2014	10	Red Drum	36,425	43,644	56,121
2014	11	Red Drum	16,365	14,318	25,338
2014	12	Red Drum	2,978	3,428	2,036
2015	1	Red Drum	1,961	5,885	2,755
2015	2	Red Drum	3,009	3,448	2,832
2015	3*	Red Drum	2,343	5,699	2,425
2015	4*	Red Drum	***	7,848	4,643

Fishing Year (Sept 1, 2014 - Aug 31, 2015) Landings 97,829

*partial trip ticket landings only

***landings are confidential



North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

Donald R. van der Vaart
Secretary

MEMORANDUM

To: N.C. Marine Fisheries Commission

From: Trish Murphey, Southern District Manager

Date: May 1, 2015

Re: Mechanical Oyster Season Update

Background

The harvest of oysters by mechanical methods is managed under Supplement A to Amendment 2 to the N.C. Oyster Fishery Management Plan. Mechanical methods for harvesting oysters are prohibited in areas designated in 15A NCAC 03R .0108. The director has proclamation authority to further restrict all aspects of the fishery and is guided in the use of that authority by management strategies in Amendment 2 and Supplement A.

The mechanical harvest of oysters is managed under separate strategies for the smaller bay areas and the larger area of sounds and rivers. The areas where mechanical harvest is allowed in the smaller bays are limited to a six-week season with a harvest limit of 10 bushels per fishing operation. This harvest limit coincides with the hand harvest limit in the same area. Mechanical harvest season in these bays closed on December 19, 2014. The remaining mechanical harvest areas are open to harvest until the percentage of legal oysters in samples collected from an area drop below 26 percent for two consecutive sampling periods. Sampling is still conducted in the closed areas throughout the oyster season and if an area that is closed has two consecutive samples above 26 percent it can be re-opened for harvest. Harvest limits in these areas are set by the director up to a maximum of 20 bushels. The mechanical harvest season in all mechanical harvest areas opened November 10, 2014.

Western Pamlico Sound oyster resources were impacted by Hurricane Irene in August 2011 with low dissolved oxygen in bottom waters occurring in late summer 2012, greatly reducing productivity. The deep water portions of the lower Neuse River have not produced any oysters since 2012 due to mortality from low dissolved oxygen events and slow recovery in the Pamlico River Area from Hurricane Irene. Landings in the mechanical harvest fishery increased to 64,137 bushels during the 2013/14 season (Figure 1). Mechanical harvest was closed in the Neuse River Area on February 28, 2014 but there were few boats working and harvesting was confined to a limited area spared from the low dissolved oxygen mortality event (Figure 2). Mechanical harvest was closed in the western Pamlico Sound Area on March 24, 2014 but most of the boats working this area had already moved to the Northern Dare Area to finish out the season. Both closures were made due to samples failing to meet the 26 percent legal sized oyster criterion. The Northern Dare Area remained open until the oyster season closed by rule on March 31, 2014.

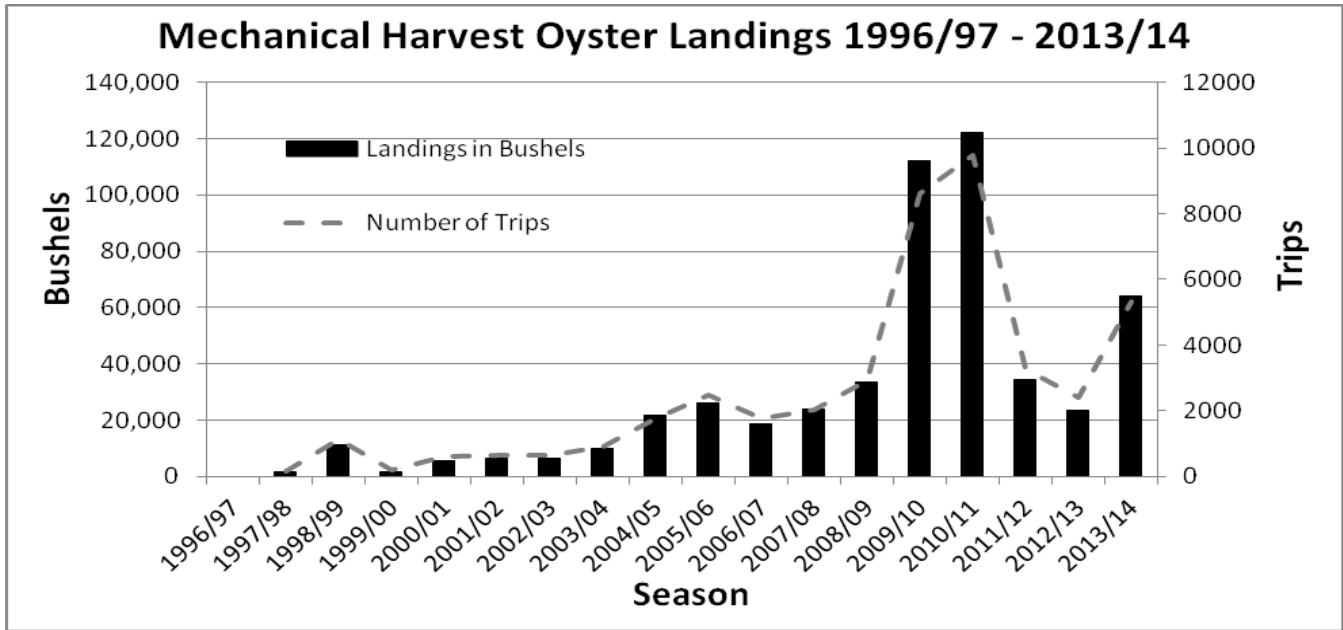


Figure 1. Mechanical harvest oyster landings by season 1996/97 through 2013/14. (DMF Trip Ticket Program)



Oyster FMP Supplement A Management Areas



- Boundaries
- Military Danger Zone and Restricted Areas (MDZRA)

Datum: NAD83
 Projection: NC State Plane
 Map Date: October 2014



Figure 2. Areas used for management under the provisions of Supplement A.

2014/15 Oyster Sampling

Mechanical harvest of oysters is managed in four areas (Figure 2). Preseason sampling for the Neuse River Area was confined to the limited area worked in 2013/14. Samples in this area indicated oyster sizes were above the 26% trigger when the mechanical harvest season opened on November 10, 2014. Effort has been consistently low in the Neuse River due to oystermen having to work all day (no later than 4:00 p.m.) to harvest five to seven bushels, which is lower than the 15-bushel limit. Sampling results in the Neuse River were above the trigger, however low numbers of small oysters influenced the percentages (Table 1). This is likely due to impacts from Hurricane Irene and low dissolved oxygen impacts to the area over the past several years, resulting in low recruitment. On January 21, 2015 sampling results fell below 26 percent legal-size oysters (Table 1). Additional sampling of Neuse River took place on January 29 with the resulting percentage above the trigger (Table 1). Weather impacted sampling during most of the month of February making it difficult to sample on the preferred two week intervals. Samples were taken in March and were below the 26% trigger resulting in its closure on March 23rd. Final samples were taken on April 13th which resulted in 14% legal oysters after the season closed.

Preseason sampling in the Pamlico River Area also showed the initial percentage of legal-size oysters were above the 26% trigger when the mechanical harvest season opened. Additionally, the oysters showed signs of growth and significant numbers of sublegal sizes that should attain the 3-inch minimum size during the season. Fishing effort was much higher in the Pamlico River area than the Neuse River with much of the fleet scattered from the mouth of the river to Brant Island. As with the Neuse River, weather during February made it difficult to sample and appeared to impact the dredge fleet as well. Sampling on February 4th and February 27th yielded 22.2% and 23.3% legal size oysters respectively. Pamlico River closed on March 9th. Due to weather, division staff was unable to collect an end of season sample in Pamlico River.

Northern Hyde and Northern Dare areas were also above the percentage of legal-size oysters during preseason sampling. Sampling of these areas before Christmas resulted in percentages below the trigger (Table 1). The number of small oysters in the samples influenced the percent of legal oysters sampled. Effort in Northern Hyde was mostly in Wysocking Bay while effort in Dare County was from Sandy Point to the Crab Hole. After Christmas, more effort shifted into the Crab Hole area off of Stumpy Point Bay due to Hyde County boats joining the Northern Dare fishery. Dealers reported that fishermen were bringing in their limits by mid-day. Unfortunately after the shift to Northern Dare, sampling resulted in less than 26 percent legal-size oysters for two consecutive sampling trips in both Dare and Hyde Counties (Table 1). This resulted in a closure of these areas on January 12th, at sunrise. Sampling of these areas commenced again the week of January 26th to determine if oysters grew enough to reopen but as of February 12th, these areas remain below the trigger (Table 1). It was decided to stop sampling Hyde County because of no improvement in the percentage of legal sized oysters. Staff continued to sample Dare County and on February 25th, and March 3rd the percent of legal oysters reached 26.2% and 27.9% respectively and so Dare County reopened on March 9th and closed on March 31st. The fleet encountered what was described as a “crust” covering much of the oyster rocks fished on opening day and took several days to break up this “crust”. Effort was high in the area for the re-opening with approximately 50 boats fishing on the first day and dropping off to around 20 boats. End of season sampling showed both areas above the 26% trigger (Table 1).

Overall the season peaked in December with over 1,800 trips landing approximately 20,000 bushels of oysters during that month (Figure 3). Closures of Hyde and Dare Counties resulted in declines of trips and harvest January and in combination with weather impacts in February. Overall, the 2014/15 season shows dredge harvest to be approximately 45,000 bushels and is down from last season's total of 64,000 bushels. However, March 2015 data are incomplete at this time.

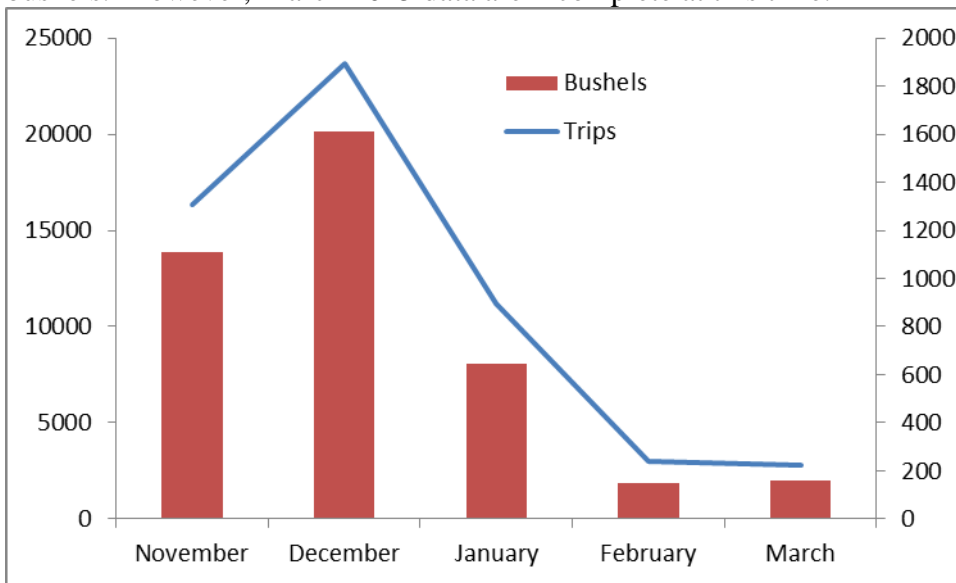


Figure 3 Number of dredge trips and bushels by month for the 2014/15 Harvest Season (March data incomplete)

Table 1. 2014/15 Percentage of legal sized oysters by area. *Includes samples from Wysocking Bay which closed December 19

2014-2015 Trigger Sample Results							
Neuse River		Pamlico River		Northern Hyde County		Northern Dare County	
Date	Percentage	Date	Percentage	Date	Percentage	Date	Percentage
Sep. 22, 2014	24.6	Sep. 22, 2014	23.8	Oct. 1, 2014	31.0	Sep. 16, 2014	28.0
Nov. 5, 2014	32.0	Oct. 20, 2014	37.0	Dec. 1 2014	30.0	Dec. 3, 2014	34.0
Dec. 3, 2014	31.2	Nov. 5, 2014	33.4	Dec. 15, 2014	21.3	Dec. 16, 2014	23.0
Dec. 15, 2014	36.0	Nov. 19, 2014	34.7	Jan. 5, 2015	24.6	Jan. 6, 2015	22.0
Jan. 6, 2015	32.0	Dec. 3, 2014	39.6	Jan. 29, 2015	22.0	Jan. 26, 2015	24.0
Jan. 21, 2015	23.3	Dec. 15, 2014	34.3	Feb. 12, 2015	22.7	Feb. 9, 2015	25.7
Jan. 29, 2015	29.2	Jan. 6, 2015	30.0	Mar. 31, 2015*	28.5	Feb. 25, 2015	26.2
Feb. 9, 2015	27.3	Jan. 21, 2015	30.3			Mar. 3, 2015	27.9
Mar. 9, 2015	19.1	Feb. 4, 2015	22.2			Mar. 25, 2015	28.8
Mar. 17, 2015	15.7	Feb. 27, 2015	23.7				
Apr. 13, 2015	13.9						