Atlantic States Marine Fisheries Commission

Executive Committee

August 7, 2024
8:00 – 10:00 a.m.

Draft Agenda

The times listed are approximate; the order in which these items will be taken is subject to change; other items may be added as necessary.

A portion of this meeting may be a closed for Committee members and Commissioners only.

1. Welcome/Call to Order *(J. Cimino)*

2. Board Consent
   - Approval of Agenda
   - Approval of Meeting Summary from May 2024

3. Public Comment

4. Legislative Update
   - Discuss Commission Position on "Fisheries Data Modernization and Accuracy Act of 2024''

5. Future Annual Meetings Update

6. Other Business/Adjourn

The meeting will be held at The Westin Crystal City (1800 Richmond Highway, Arlington, VA; 703.486.1111) and via webinar; click here for details.

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

DRAFT MEETING SUMMARY OF THE

ATLANTIC STATES MARINE FISHERIES COMMISSION

EXECUTIVE COMMITTEE

Westin Crystal City
Arlington, VA

May 1, 2024

For Review and Action by the Executive Committee August 7, 2024

INDEX OF MOTIONS

ATTENDANCE

Committee Members

Pat Keliher, ME
Cheri Patterson, NH
Dennis Abbott, NH (LA Chair)
Dan McKiernan, MA, Vice Chair
Jason McNamee, RI
Justin Davis, CT
Marty Gary, NY
Joe Cimino, NJ, Chair
Kris Kuhn, PA
Roy Miller, DE (GA Chair)
John Clark, DE
Lynn Fegley, MD
Jamie Green, VA
Chris Batsavage, proxy for Kathy Rawls, NC
Ben Dyar, SC
Doug Haymans, GA
Jeff Renchen, proxy for Erika Burgess, FL

Other Commissioners/Proxies

David Borden, RI GA
Doug Grout, NH GA
Jeff Kaelan, NJ GA
Ray Kane, MA GA
Chris McDonough, proxy for Malcolm Rhodes, SC
Nichola Meserve, MA DMF
Eric Reid, RI LA proxy
Renee Zobel, NH F&G

Staff

Bob Beal
Alexander Law
Laura Leach
Madeline Musante
Jainita Patel
Geoff White

Guests

Chip Lynch, NOAA
Ronald Owens, PRFC
Will Poston
Mike Ruccio, NOAA

CALL TO ORDER
The Executive Committee of the Atlantic States Marine Fisheries Commission convened May 1, 2024 in the Jefferson Ballroom at The Westin Crystal City in Arlington, Virginia. The meeting was called to order at 8:00 a.m. by Chair Joe Cimino.

APPROVAL OF AGENDA
The agenda was approved as presented.

APPROVAL OF SUMMARY MINUTES
The summary minutes from the January 24, 2024 meeting were not available so will be approved at the August meeting.

PUBLIC COMMENT
There was no public comment.

LEGISLATIVE COMMITTEE UPDATE
Legislative Program Coordinator Alexander Law provided an update to the Executive Committee on the recent activities of Congress, upcoming budget hearings, the appropriations process, and proposed cuts to essential programs within the President's FY25 budget for NOAA. Within the appropriations update, Alexander discussed three new requests from ASMFC to Congress for funding for FY25; 1) An industry-based trawl survey pilot program ($3 million); 2) Funding to complete all research outlined in the VIMS Menhaden report ($2.7 million); and 3) One-time Congressionally Directed Spending to retrofit the Lady Lisa ($1 million).

FY25 BUDGET
Mr. McKiernan presented the proposed FY25 Commission budget which was reviewed by the Administrative Oversight Committee (AOC). Mr. McKiernan moved approval of the budget on behalf of the AOC. This motion passed unanimously.

ADJOURN
The Executive Committee adjourned at 8:25 a.m. to convene a closed session.

.....

(Original Signature of Member)

118TH CONGRESS
2D SESSION

H. R. _____

To require the Administrator of the National Oceanic and Atmospheric Administration to reform the Marine Recreational Information Program of the National Marine Fisheries Service, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

Mr. GRAVES of Louisiana introduced the following bill; which was referred to the Committee on _____

A BILL

To require the Administrator of the National Oceanic and Atmospheric Administration to reform the Marine Recreational Information Program of the National Marine Fisheries Service, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the ''Fisheries Data Modernization and Accuracy Act of 2024''.

SEC. 2. DEFINITIONS.

In this Act:

(1) ADMINISTRATOR.—The term ''Administrator'' means the Administrator of the National Oceanic and Atmospheric Administration, acting through the Director of the National Marine Fisheries Service.

(2) FISHERY.—The term ''fishery'' has the meaning given the term in section 3 of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1802).

(3) INDEPENDENT ENTITY.—The term ''independent entity''—

(A) means an entity that—

(i) is not a unit of the National Oceanic and Atmospheric Administration; and

(ii) has expertise in areas of science related to fishery stock assessments; and

(B) includes—

(i) the National Academies of Sciences, Engineering, and Medicine; and

(ii) an institution of higher education (as such term is defined in section 101 of the Higher Education Act of 1965 (20 U.S.C. 1001)).

(4) MRIP.—The term ''MRIP'' means the Marine Recreational Information Program of the National Marine Fisheries Service.

(5) NATIONAL ACADEMIES.—The term ''National Academies'' means the National Academies of Sciences, Engineering, and Medicine.

(6) PSE.—The term ''PSE'' means the percent standard error.

(7) PULSE SPECIES.—The term ''pulse species'' means a species that, due to regulatory constraints or the movement or availability of the species on a seasonal basis—

(A) is caught—

(i) on an intermittent or infrequent basis; or

(ii) only during an abbreviated timeframe; and

(B) is likely not sampled in a representative manner by data collected through the MRIP.

(8) REGIONAL FISHERY MANAGEMENT COUNCIL.—The term ''Regional Fishery Management Council'' means a Regional Fishery Management Council established under section 302 of the Magnu-

son-Stevens Fishery Conservation and Management Act (16 U.S.C. 1852).

(9) REGIONAL STATE FISHERIES COMMISSION.—The term ''regional State fisheries commission'' means each of—

(A) the Atlantic States Marine Fisheries Commission;

(B) the Gulf States Marine Fisheries Commission; and

(C) the Pacific States Marine Fisheries Commission.

(10) SCIENTIFIC AND STATISTICAL COMMITTEE.—The term ''scientific and statistical committee'' means a scientific and statistical committee established pursuant to section 302(g) of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1852(g)).

(11) SEASONAL FISHERY.—The term ''seasonal fishery'' means a fishery—

(A) that is subject to an annual closed season; or

(B) that may be affected by in- or post-season accountability measures that result in fishing or harvest closures.

(12) STANDING COMMITTEE.—The term ''standing committee'' means the standing committee established pursuant to section 2(b)(1).

(13) STOCK OF FISH.—The term ''stock of fish'' has the meaning given the term in section 3 of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1802).

(14) WAVE.—The term ''wave'' means the shortest period in which MRIP data are aggregated and reported for use in management decisions.

SEC. 3. RECREATIONAL FISHING DATA COLLECTION REFORM.

(a) IN GENERAL.—The Administrator shall reform the MRIP in effect as of the date of the enactment of this section to meet the unique needs of individual regions and States, taking into consideration the needs of State-level programs related to recreational fishing catch and effort surveys in effect as of the date of the enactment of this section to ensure that such reform does not unnecessarily dilute the effectiveness of such programs.

(b) NATIONAL ACADEMIES.—

(1) STANDING COMMITTEE.—

(A) IN GENERAL.—The Administrator shall enter into an agreement with the National Academies to establish a standing committee

within the National Academies that shall meet regularly to discuss issues related to recreational fisheries data collection and management.

(B) INDEPENDENCE.—In carrying out this subsection, the standing committee shall operate independently and without the influence of the Administrator.

(C) COMPOSITION.—The standing committee shall include individuals who are experts in recreational fisheries data collection and management, including representatives from State fish and wildlife agencies.

(2) CONSULTATION REGARDING PSE.—

(A) IN GENERAL.—If the PSE for data collected through the MRIP for a given seasonal fishery reaches or exceeds 30 percent in a given wave, or if a State submits a petition with respect to a given seasonal fishery under paragraph (4), the Administrator shall consult with the standing committee regarding options—

(i) to reduce the PSE of such seasonal fishery; or

(ii) if reducing the PSE is not practicable, to adjust the management of such seasonal fishery, including by using the management approaches described in section 302(h)(8) of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1852(h)(8)) or multi-year annual catch limits.

(B) REPORT.—After the Administrator consults with the standing committee under subparagraph (A) with respect to a seasonal fishery described in that subparagraph, the Administrator shall, not later than 6 months after the date on which either the PSE for data collected through the MRIP for such seasonal fishery exceeds 30 percent in a given wave or the Administrator receives a petition submitted by a State under paragraph (4), publish a report specifying—

(i) the options considered under that subparagraph (A);

(ii) the recommendation of the Administrator regarding how—

(I) to reduce the PSE for data collected through the MRIP for such seasonal fishery; or

(II) to adjust the management of such seasonal fishery in a manner that allows continued access and considers recommendations contained in the report submitted to Congress under section 102 of the Modernizing Recreational Fisheries Management Act of 2018 (Public Law 115–405); and

(iii) the reasoning, written in a manner easily understood by the public, for giving such recommendation.

(C) REGIONAL FISHERY MANAGEMENT COUNCIL.—If the Administrator publishes a report under subparagraph (B) with respect to a seasonal fishery described in subparagraph (A), the Administrator shall send such report to the relevant Regional Fishery Management Council for consideration.

(3) CONSIDERATION.—In carrying out paragraphs (1) and (2), the Administrator and the

standing committee shall consider issues including the following:

(A) Whether the data collected through the MRIP is appropriate and useful for management decisions, including options to improve data collection methods.

(B) The extent to which existing and potential data collection options are—

(i) burdensome to anglers; and

(ii) an efficient or appropriate use of resources.

(C) Whether and to what extent specific recommendations from the report published by the National Academies titled ''Data and Management Strategies for Recreational Fisheries with Annual Catch Limits'' (2021) and other relevant National Academies activities can and should be applied in light of the particular context of the fishery being considered.

(4) PETITION TO INITIATE CONSULTATION.—A State may submit to the Administrator a petition for the Administrator to initiate the consultation process under paragraph (2) with respect to a given seasonal fishery if—

(A) the PSE for data collected through the MRIP for such seasonal fishery is—

(i) significantly greater or less than the preceding 3-year average PSE for such seasonal fishery; or

(ii) substantially greater than the PSE for data collected through State surveys for such seasonal fishery; or

(B) data collected through the MRIP for such seasonal fishery is unreliable because the stock of fish of such seasonal fishery is—

(i) infrequently encountered through MRIP surveys; or

(ii) a pulse species.

(5) COMBINED REPORTS.—In carrying out this subsection, the Administrator may carry out a single consultation with the standing committee under paragraph (2) with respect to 2 or more species if the Administrator and the standing committee jointly determine the underlying issues that triggered the consultation are highly similar.

(c) RULE OF CONSTRUCTION.—Nothing in this section may be construed to override the role of the scientific and statistical committees in advising the Regional Fish-

ery Management Councils regarding recommendations developed pursuant to this section.

SEC. 4. STATE RECREATIONAL FISHERY CATCH AND EFFORT DATA COLLECTION.

(a) STATE RECREATIONAL FISHERY CATCH AND EFFORT DATA COLLECTION PROGRAM.—

(1) IN GENERAL.—A State may, subject to the approval of the Administrator, carry out a program within the waters of such State and Federal waters to collect recreational fishing catch and effort data for individual, or sets, of species that are federally managed.

(2) REQUIREMENTS.—If a State carries out a program under paragraph (1), the head of such program shall—

(A) ensure that such program complies with paragraph (3);

(B) collect recreational fishery catch and effort data with respect to such State;

(C) report such data that is necessary for Federal management to the Administrator in a manner and timeliness that complies with section 401 of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1881); and

(D) take into consideration the burden of such program to the average angler such that such program is not overly burdensome to the point that substantial noncompliance would be expected.

(3) DATA REQUIREMENTS.—The Administrator, in consultation with the regional State fisheries commissions, shall, with respect to data collected through a recreational fishery catch and effort data collection program of a State carried out under this subsection—

(A) establish universal standards regarding the collection of such data, including ensuring that such standards—

(i) allow for flexibility in the design of such programs to account for differences in recreational fishing activity between States; and

(ii) facilitate the collection of comparable data between States within a region for the purposes of stock assessments and management;

(B) establish such data as the baseline for the calibration of historic estimates of recreational catch; and

(C) use such data to establish catch limits and monitor landings without calibration to any Federal program, including the MRIP.

(4) USE OF STATE DATA.—

(A) IN GENERAL.—Data collected through a State program carried out under this subsection may be used in Federal stock assessments and regulatory actions.

(B) MRIP.—If a State collects data pursuant to this subsection that is collected pursuant to the MRIP, the Administrator shall use the data collected by the State in place of the data collected pursuant to the MRIP.

(5) SUBSEQUENT FUNDING.—Upon approval by the Administrator of a recreational fishery catch and effort data collection program of a State under paragraph (1), funding previously allocated to such State for the collection of recreational fishery catch and effort data through the MRIP shall continue to be allocated to such State for such State to carry out such program of the State.

(b) GRANT PROGRAM.—

(1) IN GENERAL.—Not later than 180 days after the date of the enactment of this section, the Administrator shall establish and carry out a grant

program to award amounts to States to develop, with respect to each such State, a new, or improve an existing, program described in subsection (a).

(2) APPLICATIONS.—To be eligible for a grant under this subsection, a State shall submit to the Administrator an application in such form, at such time, and containing such information as the Administrator determines appropriate.

(3) USE OF FUNDS.—A State that is awarded a grant under this subsection shall use such award—

(A) to support the development or improvement of a program described in subsection (a) of such State;

(B) to enhance the timeliness of reporting by such State of data collected by such State through such program; and

(C) to increase the accuracy and precision of the data collected by such State pursuant to such program.

(4) PRIORITY.—In awarding grants under this subsection, the Administrator shall give priority to applications—

(A) based on the ability of the award to reduce the uncertainty of data collected through the MRIP, including with respect to—

(i) economically or socially important species;

(ii) species a fishery of which is at risk of closure; and

(iii) species a fishery of which is at risk of closing another fishery because the management of both fisheries are intermingled; and

(B) that would alter or improve an existing State program carried out under subsection (a) to meet the requirements under subsection (a)(3).

(c) REPORT.—On the date that is 2 years after the date of the enactment of this section, and biennially thereafter, the Administrator shall submit to the appropriate congressional committees and make publicly available a report regarding the implementation of this section that includes—

(1) the number of States that have participated in the grant program established under subsection (b);

(2) a description of each State recreational fishery catch and effort data collection program;

(3) a description of how the Administrator incorporates data collected pursuant to each such program in fishery stock assessments, fishery management decisions, and catch monitoring; and

(4) an analysis regarding the improvement in data precision and the accuracy of data collected pursuant to each such program compared to data collected through the MRIP.

(d) RULE OF CONSTRUCTION.—Nothing in this section may be construed to negate, uncertify, or otherwise undo existing State programs to collect recreational fishing catch and effort data.

SEC. 5. HEALTHY FISHERIES THROUGH BETTER SCIENCE.

(a) DEFINITION OF STOCK ASSESSMENT.—Section 3 of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1802) is amended—

(1) by redesignating paragraphs (43) through (50) as paragraphs (44) through (51), respectively;

(2) by inserting after paragraph (42) the following:

''(43) The term 'stock assessment' means an evaluation of the past, present, and future status of a stock of fish, including—

"(A) a range of life history characteristics for such stock of fish, including, to the extent practicable—

"(i) the geographical boundaries of such stock of fish; and

"(ii) information regarding age, growth, natural mortality, sexual maturity and reproduction, feeding habits, and habitat preferences of such stock of fish; and

"(B) fishing for the stock of fish."; and

(3) by redesignating the second paragraph (33) as paragraph (52).

(b) STOCK ASSESSMENT PLAN.—

(1) IN GENERAL.—Section 404 of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1881c) is amended by adding at the end the following:

"(f) STOCK ASSESSMENT PLAN.—

"(1) IN GENERAL.—The Secretary shall develop and publish in the Federal Register, on the same schedule as required for each strategic plan required under subsection (b), a plan to conduct stock assessments for priority stocks of fish for which a fishery management plan is in effect under this Act.

''(2) CONTENTS.—Each plan described in paragraph (1) shall—

''(A) for each priority stock of fish for which a stock assessment has previously been conducted—

''(i) establish a schedule for updating the stock assessment that is reasonable given the biology and characteristics of the stock of fish; and

''(ii) subject to the availability of appropriations, require completion of a new stock assessment, or an update of the most recent stock assessment—

''(I) every 5 years; or

''(II) within such other time period specified and justified by the Secretary in the plan;

''(B) for each priority stock of fish for which a stock assessment has not previously been conducted—

''(i) establish a schedule for conducting an initial stock assessment that is reasonable given the biology and characteristics of the stock; and

"(ii) subject to the availability of appropriations, require completion of the initial stock assessment not later than 3 years after the date on which the plan is published in the Federal Register unless another time period is specified and justified by the Secretary in the plan; and

"(C)(i) identify data and analysis, including both data and analysis that is and is not available at the time the plan is prepared, that would reduce the uncertainty, improve the accuracy, and increase the efficiency of future stock assessments; and

"(ii) with respect to data and analysis identified under clause (i), determine whether such data and analysis could be provided by fishermen, fishing communities, universities, and research institutions, to the extent that the use of such data would be consistent with the requirements in section 301(a)(2).

"(3) WAIVER OF STOCK ASSESSMENT REQUIREMENT.—Notwithstanding subparagraphs (A)(ii) and (B)(ii) of paragraph (2), a stock assessment is not required for a stock of fish in the plan described in paragraph (1) if the Secretary determines that such

stock assessment is not necessary and justifies such determination in the Federal Register notice required by this subsection.''.

(2) DEADLINE.—Notwithstanding section 404(f)(1) of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1881c(f)(1)), as added by this section, the Secretary of Commerce shall issue the first stock assessment plan under section 404(f) of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1881c(f)), as added by this section, not later than 2 years after the date of the enactment of this section.

SEC. 6. FISHERY-INDEPENDENT SURVEYS BY INDEPENDENT ENTITIES.

(a) IN GENERAL.—The Administrator shall establish a program to enter into contracts with independent entities on a competitive basis under which such independent entities shall conduct fishery-independent surveys designed to estimate the absolute abundance of stocks of fish included in the Fish Stock Sustainability Index on behalf of the Administrator.

(b) APPLICATIONS.—To be eligible to enter into a contract under the program established under subsection (a), an independent entity shall submit to the Adminis-

trator an application in such form, at such time, and containing such information as the Administrator determines appropriate, including evidence of the following:

(1) Use by the independent entity of modern or cutting-edge science.

(2) The ability of the independent entity to handle data in a reliable manner.

(c) USE OF DATA.—Upon favorable peer review, the Administrator, in consultation with the relevant scientific and statistical committees and independent entity and with consideration of the report submitted under section 7, shall incorporate data collected pursuant to a fishery-independent abundance survey conducted by an independent entity under the program established under subsection (a) in management decisions.

(d) REPORT.—The Administrator shall annually submit to the Committee on Natural Resources of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate a report regarding the findings of surveys conducted pursuant to this section and the incorporation of the results of such surveys in management decisions pursuant to subsection (c).

SEC. 7. REPORT.

Not later than 1 year after the date of the enactment of this section, the National Academies, in consultation

with the Harte Research Institute for Gulf of Mexico Studies, shall submit to the Committee on Natural Resources of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate and make publicly available a report regarding—

(1) the incorporation of the results of the study titled ''Estimating the Absolute Abundance of Age-2+ Red Snapper (Lutjanus campechanus) in the U.S. Gulf of Mexico'' (August 16, 2021) in management decisions of the National Marine Fisheries Service; and

(2) recommendations regarding the incorporation of data collected pursuant to section 6 in management decisions of the National Marine Fisheries Service.

SEC. 8. TRANSPARENCY AND PUBLIC PROCESS.

(a) ADVICE.—Section 302(g)(1)(B) of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1852(g)(1)(B)) is amended by adding at the end the following: ''Each scientific and statistical committee shall develop such advice in a transparent manner and allow for public involvement in the process.''.

(b) MEETINGS.—Section 302(i)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (16

U.S.C. 1852(i)(2)) is amended by adding at the end the following:

"(G) Each Council shall make available on the Internet website of the Council—

"(i) with respect to each meeting of the Council and Council coordination committee established under subsection (l) that is not closed in accordance with paragraph (3), to the extent practicable, a Webcast, live audio recording, or live broadcast of each such meeting; and

"(ii) with respect to each meeting of the Council and of the scientific and statistical committee established by the Council under subsection (g)(1)(A) that is not closed in accordance with paragraph (3), by not later than 30 days after the conclusion of each such meeting, an audio or video (if the meeting was held in person or by video conference) recording or a searchable audio or written transcript of each such meeting.

"(H) The Secretary shall maintain and make available to the public an archive of each recording and transcript made available under subparagraph (G).".

Atlantic States Marine Fisheries Commission

Atlantic Sturgeon Management Board

August 7, 2024
10:15 – 11:15 a.m.

Draft Agenda

The times listed are approximate; the order in which these items will be taken is subject to change; other items may be added as necessary.

1.	Welcome/Call to Order (*R. Self*)	10:15 a.m.
2.	Board Consent • Approval of Agenda • Approval of Proceedings from August 2018	10:15 a.m.
3.	Public Comment	10:20 a.m.
4.	Review 2024 Atlantic Sturgeon Stock Assessment Update *(A. Higgs)*	10:30 a.m.
5.	Elect Vice-Chair	11:10 a.m.
6.	Other Business/Adjourn	11:15 a.m.

The meeting will be held at The Westin Crystal City (1800 Richmond Highway, Arlington, VA; 703.486.1111) and via webinar; click here for details

MEETING OVERVIEW

Atlantic Sturgeon Management Board
August 7, 2024
10:15 a.m.– 11:15 a.m.

Chair: Ross Self Assumed Chairmanship: 10/19	Technical Committee Chair: Amanda Higgs (NY)	Law Enforcement Committee Rep: Capt. Thomas Gadomski
Vice Chair: Vacant	Advisory Panel Chair: Vacant	Previous Board Meeting: August 8, 2018
Voting Members: ME, NH, MA, RI, CT, NY, NJ, PA, DE, MD, VA, NC, SC, GA, FL, D.C., PRFC, USFWS, NMFS (19 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from August 2018

3. Public Comment – At the beginning of the meeting, public comment will be taken on items not on the agenda. Individuals that wish to speak at this time must sign-in at the beginning of the meeting. For agenda items that have already gone out for public hearing and/or have had a public comment period that has closed, the Board Chair may determine that additional public comment will not provide additional information. In this circumstance, the Chair will not allow additional public comment on an issue. For agenda items that the public has not had a chance to provide input, the Board Chair may allow limited opportunity for comment. The Board Chair has the discretion to limit the number of speakers and/or the length of each comment.

4. Review 2024 Atlantic Sturgeon Stock Assessment Update (10:30 – 11:10 a.m.)

Background

- The 2024 Stock Assessment Update was completed in July **(Briefing Materials)**.
- The TC met via webinar on July 10th to review a draft of the Stock Assessment Update and provide recommendations to the Stock Assessment Subcommittee.

Presentations

- Stock Assessment Update overview by A. Higgs

5. Elect Vice-Chair

6. Other Business/Adjourn

Atlantic Sturgeon

Activity level: Low

Committee Overlap Score: Medium (SAS, overlaps with striped bass)

Committee Task List
• Annual compliance reports due October 1st

TC Members: Amanda Higgs (NY, Chair), Ian Park (DE), Danielle Dyson (NJ), Ingrid Braun-Ricks (PRFC), Dewayne Fox (DSU), Greg Garman (VCU), Luke Lyon (DCMF), Steve Minkkinen (USFWS), Eric Schneider (RI), David Secor (UMCES), Ashlee Horne (MD), Bryant Bowen (GA), Catherine Fede (NY), Christopher Davis (VA), Ellen Waldrop (SC), Jacque Benway-Roberts (CT), John Sheppard (MA), Nathaniel Hancock (NC), Syma Ebbin (UCONN), Mike Wicker (USFWS), Mike Mangold (USFWS), Kristen Anstead (ASMFC), James Boyle (ASMFC), Katie Drew (ASMFC)

SAS Members: Michael Celestino (NJ), Jared Flowers (GA), Dewayne Fox (DSU), Amanda Higgs (NY), Bill Post (SC), Eric Schneider (RI), David Secor (UMCES), Jason Boucher (NOAA), Margaret Conroy (DE), Nathaniel Hancock (NC) Katie Drew (ASMFC), Kristen Anstead (ASMFC), James Boyle (ASMFC)

DRAFT PROCEEDINGS OF THE

ATLANTIC STATES MARINE FISHERIES COMMISSION

ATLANTIC STURGEON MANAGEMENT BOARD

The Westin Crystal City
Arlington, Virginia
August 8, 2018

These minutes are draft and subject to approval by the Atlantic Sturgeon Management Board.
The Board will review the minutes during its next meeting.

TABLE OF CONTENTS

INDEX OF MOTIONS

ATTENDANCE

Board Members

Douglas Grout, NH (AA)
Dennis Abbott, NH, proxy for Sen. Watters (LA)
Ritchie White, NH (GA)
Sarah Ferrara, MA, proxy for Rep. Peake (LA)
Mike Armstrong, MA, proxy for D. Pierce (AA)
Raymond Kane, MA (GA)
Eric Reid, RI, proxy for Sen. Sosnowski (LA)
David Borden, RI (GA)
Sen. Craig Miner, CT (LA)
Justin Davis, CT, proxy for P. Aarrestad (AA)
John McMurray, NY, proxy for Sen. Boyle (LA)
Jim Gilmore, NY (AA)
Maureen Davidson, NY, Administrative proxy
Heather Corbett, NJ, proxy for L. Herrighty (AA)
Emerson Hasbrouck, NY (GA)
Adam Nowalsky, NJ, proxy for Asm. Andrzejczak (LA), Chair
Tom Fote, NJ (GA)
Andrew Shiels, PA, proxy for J. Arway (AA)
Loren Lustig, PA (GA)
Roy Miller, DE (GA)
John Clark, DE, proxy for D. Saveikis (AA)
Craig Pugh, DE, proxy for Rep. Carson (LA)
Lynn Fegley, MD, proxy for D. Blazer (AA)
Russell Dize, MD (GA)
Pat Geer, VA, proxy for S. Bowman (AA)
Sen. Monty Mason, VA (LA)
Bryan Plumlee, VA (GA)
Steve Murphey, NC (AA)
Chris Batsavage, NC, Administrative proxy
Ross Self, SC, proxy for R. Boyles (AA)
Malcolm Rhodes, SC (GA)
Mel Bell, SC, proxy for Sen. Cromer (LA)
Spud Woodward, GA (GA)
Doug Haymans, GA (AA)
Krista Shipley, FL, proxy for J. McCawley (AA)
Marty Gary, PRFC
Dan Ryan, DC Fisheries, proxy for B. King
Mike Millard, USFWS
Derek Orner, NMFS

(AA = Administrative Appointee; GA = Governor Appointee; LA = Legislative Appointee)

Ex-Officio Members

Staff

Robert Beal
Toni Kerns
Katie Drew
Max Appelman
Jeff Kipp
Jessica Kuesel

Guests

Julie Crocker, NOAA
Mari-Beth DeLucia, The Nature Conservancy
Matt Gates, CT DEEP
Arnold Leo, E. Hampton, NY
Mike Luisi, MD DNR
Chip Lynch, NOAA
Dan McKiernan, MA DMF
Nichola Meserve, MA DMF
Nick Popoff, ME DMR
Jack Travelstead, CCA
Chris Wright, NMFS

The Atlantic Sturgeon Management Board of the Atlantic States Marine Fisheries Commission convened in the Jefferson Ballroom of the Westin Crystal City Hotel, Arlington, Virginia; Wednesday, August 8, 2018, and was called to order at 10:55 o'clock a.m. by Chairman Adam Nowalsky.

CALL TO ORDER

CHAIRMAN ADAM NOWALSKY: I would like to welcome everyone to this meeting of the Sturgeon Board. I'm Adam Nowalsky; our Chair, joined up front here by Max Appelman from staff.

APPROVAL OF AGENDA

CHAIRMAN NOWALSKY: Our first order of business today will be to get through the approval of the agenda as it's been provided. Is there any request for changes to the agenda as it's been provided? Seeing none; the agenda stands approved.

APPROVAL OF PROCEEDINGS

CHAIRMAN NOWALSKY: Second order of business is to approve the proceedings from the October, 2017 Board meeting. Is there any request for changes to those proceedings as they have been presented? Seeing none; those proceedings are approved.

PUBLIC COMMENT

CHAIRMAN NOWALSKY: Our next order of business will be to address public comment. This would be public comment for any issues that are not on the agenda.

We do not have anyone signed up. Are there any hands from any members of the audience that wish to offer public comment? Seeing none; we'll move on to our fourth agenda item, which if anyone's taking notes makes us right on time.

UPDATE ON 5-YEAR STATUS REVIEW OF THE ENDANGERED SPECIES ACT LISTING AND RECOVERY PLAN

CHAIRMAN NOWALSKY: Okay, so we're going to turn to Julie Crocker from the Endangered Fish Branch Chief from GARFO for an update on the 5-year status review of the ESA listing and recovering plan.

MS. JULIE CROCKER: Hi, I'm Julie Crocker; National Marine Fisheries Service, Greater Atlantic Region. I'm going to provide a follow on and update to a presentation that Lynn Lankshear provided to you all at last summer's meeting on where we are with the Atlantic Sturgeon 5-year status review and recovery planning.

The 5-year review is required by Section 4 of the Endangered Species Act. A 5-year review is a periodic analysis of a species status conducted to ensure that the listing classification of a species that is threatened or endangered remains accurate. Because we have five listed DPSs of Atlantic sturgeon, we need to conduct five reviews; but we will consolidate that into one document that will be prepared jointly by the Greater Atlantic Region and the Southeast Region and coordinated with NMFS Headquarters.

On March 16, 2018, we announced in the Federal Register that we are starting the 5-year review process; and requested submissions of information that might be helpful to us as we carry out the review. That 60 day period closed on May 16. We received nine submissions of information; and all of the information that we received is available on the regulations.gov web page. We received information and comments from a small number, but a fairly wide variety of stakeholders that are listed there. A number of questions came into us during and shortly after the period; regarding whether we had access to the

data submitted by the states and researchers to ASMFC for the recent stock assessment. We do have access to that and we'll be working to make sure that we consider the stock assessment as the best available source of information.

But we did also want to let people know that even though the formal 60 day period for providing information has ended; we can still accept information if people do have new information sources, new data, new analysis that was completed since the information was provided for the stock assessment. We will certainly continue to take that information.

I'm going to talk a little bit about what the 5-year review entails; and what it will look like. It's important to remember that the 5-year review on its own does not change the listing status for the DPSs; but it will either confirm that the listing status remains accurate, or it will indicate that it's not accurate, which would prompt a new rule-making process including proposed rules, public comment periods, et cetera.

For the five Atlantic sturgeon DPSs, we plan to review the information for and write the draft 5-year review internally. That will be done by the Greater Atlantic Region and Southeast Region in cooperation with our Headquarters office. Use the stock assessment as one of the primary sources of new information.

We do plan to request the Sturgeon Technical Committee to peer review the draft 5-year review; similar to the way that the information was reviewed for the Critical Habitat Designation, and we do intend to complete one review document for all five distinct population segments. To talk a little bit about what the 5-year review will include.

We will have to look at the DPS Policy, consider whether there is any new information that would cause us to reconsider the terminations regarding DPSs. For example, do they continue to meet the criteria for discreetness and significance? We will summarizes new information; sighting detailed information and analyses, and we'll indicate whether there is a change in species status or change in the magnitude or imminence of threats since the last status review.

Then we'll also go through each of the five listing factors; providing summary and relevant new information, including conservation measures regarding the magnitude, scope, and severity and imminence of previously identified threats, and also discuss if there are any new threats to the species. In the synthesis section of the 5-year review, we provide an updated assessment of the status of the species and threats.

We note significant changes and explain why the species continues to meet the definition of threatened or endangered as appropriate. This section concludes with a recommended classification; either for an endangered species to down-list it to threatened, for threatened species we can recommend to up list to endangered.

We could recommend to delist any of the DPSs; or we could recommend that the classification should stay the same. Again, if there was any change recommended in the 5-year review that would prompt a new rule-making process. The 5-year review on its own cannot make a change to the listing status. We expect the final product; the final 5-year review to be ready in 2019. We hope to have a draft available for peer review in early 2019. There is no formal timeline associated with the 5-year review; but we would like to get moving on this and complete it quickly.

There will be a Notice of Availability in the Federal Register when it is completed. If anyone is interested for more information on what the 5-year review will contain;

there is a template available on our website that we will follow for the review. Now I'm going to pivot a little bit and talk about recovery planning.

Section 4 of the ESA requires that recovery plans are developed for all listed species. To the extent that we can work on both at the same time; we're also pursuing recovery planning for the five DPSs, in cooperation with our Headquarters Office in the Southeast Region. But given the focus on the 5-year review we don't expect to get too far into recovery planning until probably this time next year.

A Recovery Plan is basically a road map for species recovery; it lays out the path and tasks required to restore self-sustaining wild populations for the species. I'm going to talk a little bit about what the recovery plan will contain. Before I do that; as a preliminary step towards recovery planning, the Greater Atlantic Region and Southeast Region together developed a Recovery Outline for Atlantic sturgeon, which is really an opportunity for us to present a preliminary conservation strategy to guide the future recovery planning efforts.

I think that was provided in the meeting materials; and it's also available on our website. In terms of recovery planning, as I mentioned we're just at the beginning stages. At this point we're really trying to figure out what the best format to go forward with is. We're working with Southeast Region Headquarters to determine what approach makes the most sense; in light of species needs, limited resources, and differences in common threats across the DPSs.

We could produce one recovery plan for all five distinct populations. We could produce five different recovery plans; which doesn't seem to make a lot of sense, or we could break it up regionally and do a northeast and a southeast plan. We're also considering whether we should fold in short-nosed sturgeon to the Atlantic Sturgeon Recovery Plan to update the 1998 recovery plan for shortnosed sturgeon.

We are looking for feedback, information, ideas people might have on what might be the most effective and efficient approach for recovery planning. I'm going to talk a little bit about what the Recovery Plan will include. A Recovery Plan must have recovery actions, recovery criteria, and estimates of recovery timeline and cost.

I'm going to go through those a little bit on the next slide. The recovery goal is almost always recovery of the species and delisting. The species is listed as endangered. We'd also have an intermediate goal of reclassifying the species as threatened. The recovery objectives are identified in terms of demographic parameters, reduction or elimination of threats to the species, and any other particular vulnerabilities or biological needs inherent to the species. The recovery criteria comprise the standards upon which the decision to reclassify or delist the species is based; and they need to be objective and measurable. They address threats as well as demographic factors; and must be written in terms of each of the five listing factors. There is some question about an example of what recovery criteria might look like.

I pulled this from the draft Green Sturgeon Recovery Plan; just to give an example of what recovery criteria might look like. An example for demographic recovery criteria was the adult southern DPS green sturgeon census population remains at or above 3,000 for three generations. In addition the effective population size must be at least 500 individuals in any given year; and each annual spawning run must be comprised of a combined total from all spawning locations of at least 500 adult fish in any given year.

That gives you a sense of what recovery criteria for Atlantic sturgeon could look like. Then we would also have threat spaced criteria. Then recovery planning is definitely not intended to a closed door process. Section 4 of the ESA allows us to appoint recovery teams made up of public and private entities; who would work with us to develop and implement recovery plans. If a Recovery Team is necessary; NMFS would bring the team together by invitation. There are many forms that a team approach could take.

We're likely to hold at least one workshop; likely in probably late 2019, focused on recovery criteria, trying to figure out how we would know that the species is recovered, and likely an additional workshop on how to identify and prioritize recovery actions. We also expect that the beginning of the recovery planning process; or probably sometime in 2019, we would put out a public notice soliciting information and public comment for us to consider as we developed the recovery plan.

All recovery plans are made available in draft for public comments; so we would be doing that and likely also reaching out to the Technical Committee for peer review of the draft plan, particularly focused on the objectives and the criteria and the recovery actions. That is what I have, and happy to answer any questions as time allows.

CHAIRMAN NOWALSKY: Very good Julie, thank you very much. There is no specific action item that we need to act on as a Board today. But we would certainly entertain questions and discussion. Let me see a show of hands of who has questions or discussion. Okay, so I've got Lynn, Justin, Chris, and John. All right we'll start with Lynn; go ahead.

MS. LYNN FEGLEY: Thank you for your presentation. I just wonder with the recovery criteria; and I am pretty sure I know the answer to this. Do those criteria come with funding; and how do you deal with the fact that you have recovery criteria that nobody has the money to monitor toward? Is the money taken into account when you develop those criteria?

MS. CROCKER: We do need to identify a cost of recovery; and the recovery actions are typically broken down as to who we expect would carry those out. The recovery plan wouldn't come with any new funding. That is always a concern; is to how to actually get all of this done in the current climate.

CHAIRMAN NOWALSKY: Justin Davis.

MR. JUSTIN DAVIS: Thanks Julie for that presentation. There was a bullet in one of the slides relative to recovery plans that talked about site-specific criteria, or site-specific objectives. I guess my question was just what constitutes a site; and we were talking about an individual river system or the whole Atlantic coast. I'm just kind of curious about what sort of spatial scale you're talking about there when referencing site-specific things.

MS. CROCKER: I think that is in reference to the recovery actions; that the recovery actions need to be specific. For example, I have an example of threat-based criteria for the Green Sturgeon Recovery Plan. It says volitional passage is provided for adult green sturgeon through the Yolo and Sutter bypasses. That activity and location specific portion is important to identifying the recovery actions; so that they're specific and can actually be acted upon.

CHAIRMAN NOWALSKY: Next I have Chris Batsavage.

MR. CHRIS BATSAVAGE: Julie, with the green sturgeon you gave an example for their recovery plan of trying to recover three generations of green sturgeon. I guess to get a sense of how that would look

for Atlantic sturgeon if there were something similar in place for Atlantic sturgeon. How many years would that represent; as far as trying to recover three generations of sturgeon? I'm trying to get a sense of when this is put together; how many years would we expect it to take, in order to hit some of the recovery criteria for in the plan?

MS. CROCKER: Sure, I don't know enough about the differences between green sturgeon, Atlantic sturgeon to say would we use these comparable criteria or not. But looking at recovery plans in general; they typically look at somewhere between 25 and 100 year horizon. Looking at a long horizon with very significant price tag attached to them is not unusual.

CHAIRMAN NOWALSKY: John Clark.

MR. JOHN CLARK: Thank you for the presentation, Julie. I'm just wondering how this ties in. I know the recent actions that are proposed by the Fish and Wildlife Service and with NOAA Fisheries; about the ESA, and just reiterated the delisting criteria be the same as listing criteria. When you gave the example again about the green sturgeon, you were talking about actual numbers of fish.

Yet with the Atlantic sturgeon there was no population actually estimated, was there when they were listed. Would you be looking at coming up with a population targets for Atlantic sturgeon; given that wasn't used to list them, or is it more different type of measures you'll be using when you consider delisting?

MS. CROCKER: That is going to be one of the things that we're going to be looking for input and advice and comment from; is really to consider what makes the most sense for those recovery criteria, and matching them up to what the available information is. We don't want to set a set of recovery criteria that is so quantitative that they can never be reached; because we don't ever expect to have that information. We will need to match the recovery criteria to the types of information that we have available.

CHAIRMAN NOWALSKY: Okay with no further hands up; I want to thank Julie for her time here with this presentation. For the benefit of the Board that Federal Register Notice, as well as the Recovery Outline that the presentation was based on, is in the meeting materials. I'm sure this will continue to be on this Board's radar for some time to come. Thank you again.

REVIEW TECHNICAL COMMITTEE REPORT REGARDING HIGHEST PRIORITY DATA SOURCES FOR STOCK ASSESSMENTS

CHAIRMAN NOWALSKY: We'll now move on to the next agenda item; which is a TC report regarding the highest priority data sources for stock assessments, and that presentation is coming from Katie Drew. Katie.

DR. KATIE DREW: I'm going to review the report that the TC has put together on addressing these Board tasks. At the last meeting after we presented the stock assessment; the Board asked the TC to identify the datasets that are most important to Atlantic sturgeon stock assessment, and to develop recommendations about where to focus state resources, in order to improve the data quality and improve the assessment quality for this species.

The 2017 Benchmark Assessment obviously contained a detailed, prioritized list of research recommendations. But these were really sort of an ideal world list; that is there was really no consideration of funding constraints or other time constraints. It was just like this is what we would like in an ideal world.

In order to address the Board tasked them to sort of provide some new information or

new context to these recommendations. The TC reprioritized this list; to identify sort of the most cost effective actions, or to recognize how can we get the most bang for our limited buck with these recommendations.

That is sort of the context of the recommendations that we're presenting in this memo; compared to the more detailed, extensive list in the assessment report itself. I'm just going to go through the actual recommendations and touch briefly on each one of them. I think our first recommendation was to encourage data sharing among partner agencies and academic institutions.

One of the strengths of this assessment was the ability to pull in data from a number of different sources; including a lot of sources that we don't always go to in a traditional stock assessment. But I think limited data, and I think difficulties in getting some data also held us back in certain areas, and in certain aspects of this assessment.

The TC reiterates its support of encouraging data sharing across a number of different agencies; and making that more easy for everyone to do. Our second recommendation was to continue to conduct the fishery independent surveys; that were used to develop indices of abundance for Atlantic sturgeon, either the ones that are existing now or the ones that were identified as being good potential indices with more years of data.

In addition, states should consider modifying existing surveys to be more effective at monitoring sturgeon; so identify strata or areas or methods that your current surveys could change slightly to be more effective at actually catching sturgeon. These are the high priority indices that we identified. The ones in green are the ones that were actually used in the assessment to track abundance. The ones in blue are ones that we identified as good potential indices; but that just needed more years of data in order to be reliable for this long-lived species. It's a combination of juvenile and adult indices here.

Our third recommendation was to continue to acoustically tag Atlantic sturgeon; and maintain the receiver arrays. The tagging model was our primary source of information on mortality rates; and so in order to be able to monitor the current mortality levels of, are we killing too many sturgeons for whatever reasons. We need to be able to continue to collect data from these tagged sturgeon; and these receiver arrays.

Our fourth recommendation was to collect and improve data collection on the incidental catch of Atlantic sturgeon; and the fifth one was to collect data to quantify the numbers of Atlantic sturgeon killed by ship strikes each year. Bycatch and ship strikes were two of the main sources of anthropogenic mortality that the Stock Assessment Subcommittee identified as a concern for Atlantic sturgeon; and both of those are not well monitored under our current data collection.

Getting more data on these sources of mortality is very important. Our sixth recommendation was to continue processing genetic samples; to update and improve the DPS definitions, especially in the less well represented areas like the Carolina DPS and the South Atlantic DPS, to get a better handle on the genetics of this species, and the correct DPS definition.

Our seventh recommendation and I guess our final recommendation; was to consider sort of a snapshot approach to this fishery independent and fishery dependent monitoring that we've recommended, to sort of think outside the annual monitoring box, if you will. A lot of the expense of monitoring programs comes from the fact that you need to do this stuff every year.

But for sturgeon, which is long-lived, slow to mature, we're not expecting to see big changes in the population from year to year. A short-lived species like herring you want to be monitoring that every year; because you're going to see changes. For sturgeon, if we take a snapshot of the population every five years or every ten years; when it comes to things like recruitment or spawning stock surveys, we can still get a handle on how that population is progressing, but it can be more cost effective and a better use of resources.

This can also let us take advantage of short-term funding opportunities; so SK grants, things like that where an SK grant isn't going to fund a long-term monitoring program, but it can fund a two to three year study of spawning stock biomass in a river. Then come back in another five or ten years and say how are we doing compared to that original study? This is also a good chance to partner with academic institutions.

These can be good grad student projects; to get somebody to work on this, and get a good product for a short term, and then come back to it repeatedly over time. But just keep in mind that maintaining those consistent methods across the snapshots is critical; so that we can compare down the road what happened in this year with two years from now, five years from now, ten years from now. But in a sort of a limited funding situation, this can be a good alternative for something like sturgeon; where again we're not expecting to see big swings in population abundance, or even the fishery dependent pressure like bycatch. Characterizing bycatch or ship strikes could be a snapshot approach as well. The TC just wanted to highlight a couple of things out of this; basically Number 1, the permitting process does make some of these recommendations more difficult. Both permitting for things like maintaining receiver arrays in the ocean, but also things like just getting the ability to handle a sturgeon; because of the ESA listing can be difficult.

States need to make sure they're staying on top of that and are proactive with that kind of issue. Of course, I think there was some concern from the TC about unfunded mandates; that state budgets are already strained. Producing mandates to come up with a new sturgeon spawning stock survey in a state without the associated funding is going to mean difficult choices for states agencies, in terms of taking funding away from other surveys from other projects.

This was definitely a concern; and why the TC, I think, focused on how you get the most bang for your buck with what we already have? But you know there are some positive things happening that we do have improved bycatch monitoring through the Section 10 process in some states; and it provides, so states are working on getting better data for some of these fisheries.

There is a Sturgeon Carcass Report out of Delaware State University to improve the ship strike mortality estimates; so basically just throwing a bunch of dead sturgeon in the river and see how many of them are actually reported, so that we can know if people are telling you we saw five ship strike sturgeon. Is that 5 percent of the ones that were there? Is that 100 percent of the ones that happened?

There is also work being done; to process the back log of genetic samples from some of our underrepresented DPSs. Just to end on a positive note. Some of this work is going on; and should when we get to the next benchmark, help improve that as well. But there is definitely more work to be done. With that I'll take questions.

CHAIRMAN NOWALSKY: The take away from this is as a result of the last benchmark assessment and the presentation that we had; there were questions from the Board about what more can we do. Obviously, given the information we have in the last

presentation, we would all like more information about this.

But funding seems to continue to be the inhibiting issue here; to get to where we would all like to see a lot of this. Action here today, there is no action here required by the Board. We have recommendations that have come from the TC. There is the opportunity for the Board to codify any one of those as an actual requirement.

If it is the will of the Board to do so today, or again just take the information presented so far, as well as information you get from questions or discussion that comes out. Take that home; and then see what could possibly be done. With that I'll turn to the Board for questions, comments, discussion on this agenda item. A show of hands, I've got two. We'll start with John Clark.

MR. CLARK: Thank you, Katie. Just curious on the surveys that were rejected for the time series, too short, did the TC want those surveys to continue?

DR. DREW: Yes that was the TCs recommendation is that when identifying the priority surveys; the ones that were identified as having potential but being too short, should definitely be continued so that they could be folded into the assessment at a later date.

CHAIRMAN NOWALSKY: Pat Geer.

MR. PAT GEER: Mine is more of a comment. I think using the fisheries independent surveys to gather some of this information is a great idea. There are a lot of surveys out there. You listed dozens of them. A lot of those already have to have incidental take permits. If we ask them to go ahead and modify or add a new strata to target sturgeon; ironically they're going to catch more sturgeon, which ironically will go over their ITP.

That has to be addressed somehow; and it's happened in some states already, where they're seeing an increase year after year in what they're catching in their surveys. They have to go back and ask for an increase in their allowable take.

CHAIRMAN NOWALSKY: Further discussion or comments; hopefully this information from this last tasking has been helpful to the Board. Again, we can take some of this information home; and hopefully translate it into some results. Thank you for the presentation, Katie.

CONSIDER APPROVAL OF THE 2018 FISHERY MANAGEMENT PLAN REVIEW AND STATE COMPLIANCE

CHAIRMAN NOWALSKY: Next turn to our next agenda item; which at the end will require Board action and that will be Consider Approval of the 2018 Fishery Management Plan Review and State Compliance. Max will be giving us that presentation.

MR. MAX APPELMAN: This year's FMP Review actually covers the 2016 fishing year; because compliance reports are due at the end of the year covering the previous year's fishery. There is sort of this lag in the reporting period and when the actual review report is developed. This is the 2018 review of the 2016 fishing year.

First was status of the FMP and fishery. The fishery is still under moratorium; implemented through Amendment 1 in '98, and then carried into the EEZ in '99. The moratoria are expected to remain in effect until 20 year classes of spawning females are established. Moving to status of the stock, we know that all five DPS of Atlantic sturgeon were listed under the ESA in 2012, four of which were listed as endangered, and one the Gulf of Maine DPS listed as threatened.

Then in 2017, NOAA published two final rules designating critical habitat for Atlantic sturgeon. There are two documents there; one covering the Gulf of Maine/New York Bight, and Chesapeake Bay DPS, and the other for the Carolinas and South Atlantic DPS. Also in 2017, the Commission's benchmark stock assessment went through peer review. Results indicate that the population remains depleted; relative to historic abundance.

However, on a coastwide scale the population appears to be recovering slowly; since the '98 moratorium. Still the population experiences mortality from several sources; but the assessment indicates that total mortality is sustainable. Bycatch was identified as the primary source of fishing mortality; and it may be hindering population recovery. Sturgeon are most susceptible to mortality from gillnet and trawl interactions. Unfortunately total losses from bycatch are largely unknown; due to low to nonexistent rates of observer coverage in most fisheries that may encounter sturgeon. The Plan Review Team reiterates the importance of mandatory reporting or observer coverage; to effectively monitor Atlantic sturgeon bycatch in state fisheries. Ship strikes were also contributing to mortality; and were identified as an emerging issue in the assessment. Sturgeons are particularly vulnerable to ship strikes when there is a lot of cargo vessel traffic occurring in these relatively shallow shipping channels; where sturgeon routinely pass through between their ocean habitats and spawning grounds.

Moving on to ESA Section 10, Incidental Take Permits. Based on the compliance reports, a few states have received their ITPs for its fisheries; but most of the states are in the application development stage, or have just recently submitted applications. The recommendation from the PRT is familiar. It's just to continue to coordinate with the Commission regarding the status of those permits.

We've summarized the status of those permits in the report; and if you just take a look and let us know that we're up to date that would be helpful. Moving to aquaculture, so the U.S. Fish and Wildlife Service still maintains Atlantic sturgeon at three of its research facilities. Again, this is the reporting period through 2016; so these numbers up on the screen are accurate up through 2016.

Also, Maryland DNR had sturgeon captive at a number of its facilities for various research initiatives; but those activities have been terminated, due primarily to the lack of funding. Currently there are no plans to culture sturgeon in the future. LaPaz LLC, this is a commercial aquaculture company based out of North Carolina, was granted permission through Addendums II and III to import Canadian sturgeon for the purpose of commercial production.

However, recently LaPaz has shifted their focus away from the species; and is no longer in possession of Atlantic sturgeon. The majority of the fish were culled or euthanized. A handful was sold to Horse Creek Aqua Farm; which is located in Florida and covered under Addendum I to the FMP. Right now they are holding onto 117 fish as of 2016.

The remaining fish were donated to West Virginia University; to be used in various research activities. The PRT expressed some concerns about this regarding the transfer of fish to facilities outside of the Commission's jurisdiction; since West Virginia is not a Commission member state. The disposition of these fish is not well documented.

Regarding compliance in 2016, following review of the compliance reports the Review Team determined that all states and jurisdictions had implemented management and monitoring programs consistent with

the management plan. Up on the screen are the various reporting requirements for your reference. I'm happy to take any questions, Mr. Chair.

MR. NOWALSKY: Very good, thank you, Max. We can entertain questions and/or any discussion. We will need a motion from the Board to approve this review. John Clark.

MR. CLARK: Thank you, Max. I guess this question actually would kind of go to Julie; because it's about the Section 10 permits. I'm just curious for the ones that have been issued so far. Do all of them require onboard observers for the fisheries that have received Section 10 permits?

CHAIRMAN NOWALSKY: Julie?

MS. CROCKER: None of the permits that have been issued to date have come out of my office; I think they've all come out of the Headquarters Office, so I'm not familiar with the specific requirements. I believe that there is some observer, or it was a commitment from the states for an observer requirement for those fisheries. But I'm not familiar with the details.

CHAIRMAN NOWALSKY: Next up I had Mike Millard.

MR. MIKE MILLARD: Max, just an update as the Director of the Services Fisheries Center in Lamar, PA, I can tell you we have zero Atlantic sturgeon on station anymore.

CHAIRMAN NOWALSKY: Any further questions or discussion? Seeing none; I'll entertain a motion to approve the FMP review**. Tom Fote, making that motion, yes, so we have a motion from Tom to approve the FMP Review. Move to approve the 2018 FMP Review for Atlantic sturgeon. Max, given your earlier comments about this is for the 2016 fishing year. Do you believe it would be helpful to include that in the motion, to call it the 2018 FMP Review of the 2016 Atlantic sturgeon fishing year?**

MR. APPELMAN: I think review covers the fact that it's the 2016.

CHAIRMAN NOWALSKY: Okay, everybody is clear on that then? Was that a second from Pat Geer? Is there any discussion on the motion? I can't imagine there would be any; but any public comment on the motion? **Seeing none; is there any objection to the motion as presented? Okay seeing none; that Review stands approved**, and that will move us along to the next agenda item. Tina Berger. Good morning, Tina.

REVIEW RECOMMENDATION TO DISBAND THE ADVISORY PANEL

MS. TINA BERGER: Good morning, thank you, Mr. Chairman.

CHAIRMAN NOWALSKY: We'll now turn to Tina for some discussion about the Advisory Panel.

MS. BERGER: The Advisory Panel was established over 20 years ago; and that was sort of the last time they met, when they provided input on Amendment 1. Given the fishery has been under a moratorium, we've kept them abreast of emerging issues, but they have not met since 1998. The membership is whittled down; and given that the assessment showed very little change in the stock status, we don't see the need for the Advisory Panel to be maintained, at least at this point.

Staff's recommendation would be for the Board to disband the Advisory Panel. We can always reestablish a panel when and if that is necessary. If the Board chooses to maintain it we'll do so. But we just thought it doesn't make sense to maintain a primarily defunct AP. Thank you.

CHAIRMAN NOWALSKY: I'll turn to the Board for discussion, comments. Again, this

would be the consideration of a motion if it was the will of the Board to act on this. Pat Geer.

MR. GEER: Just a question for Tina. There were no members of the AP who wanted to comment on the ESA listing?

MS. BERGER: I'm going to punt that back to Max. I don't know if he reached out to the AP on that.

MR. APPELMAN: The ESA listing was before my time. But it's my understanding that they did not meet as a panel of the Commission to provide their comment on the listing; that they were made aware of the opportunity to provide comment, and might have done so as individuals.

CHAIRMAN NOWALSKY: I think it would really be at the discretion of this Board; whether there were issues that we wanted to specifically charge our AP with trying to get comment on, given the timeframe since they've lest met. I think that would need to have some review by the states of their current AP memberships as well. I'm guessing most are likely not up to date. Lynn Fegley.

MS. FEGLEY: I was just wondering if it would be useful for the Board to have an AP panel to provide input on the 5-year review, since Julie said she was going to be looking for comment. I don't know if that would help, Julie your efforts. I'm just curious if that would be something they could do.

CHAIRMAN NOWALSKY: Again, I think that would be, I think Tina and staff have brought the issue before us is that we've not had a formal AP meeting for this species in a very long time. The question is; what do we do? Staff made a recommendation. Again, it's the will of this Board if we feel that there is the need for the AP to continue. Then in that case, I think it would be worthwhile in making sure we get the AP up to date; as well as finding tasks and specifically engage them moving forward, would be my thoughts. Ritchie White.

MR. G. RITCHIE WHITE: I'll make a motion to disband the Atlantic sturgeon Advisory Panel at this point.

CHAIRMAN NOWALSKY: Motion made by Ritchie White; seconded by Ray Kane. I had a couple other hands go up; so let me turn to them for discussion. First I'll ask Ritchie if he feels any further comments needed on his part; shaking his head no. I had hands up from Roy Miller and Tom Fote. Roy.

MR. ROY W. MILLER: I kind of like Lynn's suggestion of considering an Advisory Panel to provide comments for the 5-year review. Otherwise, the obvious question is who would do that review? Would it be just the Technical Committee without input from any advisory panel? Perhaps you have an answer to that Mr. Chairman.

CHAIRMAN NOWALSKY: I do not personally. I'll look to my right to see if there is any input on who would do that. Max is going to give that a go.

MR. APPELMAN: I'll just make the Board aware of how we went about this in the past with the ESA listing; and most recently with the Critical Habitat Designation. What happened is that the Technical Committee did not formally as a group provide comment or review on those draft reports.

Instead, staff reached out on behalf of NOAA reached out to the Technical Committee to ask for a handful of members to take their own time to provide a review on those documents. That is sort of the approach that we see happening with any other ESA related documents down the road.

CHAIRMAN NOWALSKY: Next up I had Tom Fote.

MR. THOMAS P. FOTE: With the implementation of Atlantic Coast Conservation Act, it was important that one of the charges that a bunch of us made was that we would have advisors to every board from the community; the recreational, commercial and the environmental community on the Boards.

Except the Board hasn't met in 20 years, I'm a little hard pressed to push to continue running a Board. Even though I feel strongly that we should have an AP Board for every species; it just basically says we're not going to have the Board for the sturgeons, since nobody has met in 20 years. I don't know.

CHAIRMAN NOWALSKY: Are there any further comments on the motion before us? Seeing none; I'll give the Board 30 seconds to caucus. We've had a moment to caucus. Before we vote on this I'll just simply ask if there is any comment from public on this. Prior to the voting I did see a hand go up from the Board. Maureen.

MS. MAUREEN DAVIDSON: As you know I'm kind of new at this. I would like to ask, if this Panel hasn't met in 20 years, is it because the Panel as a group itself chose not to meet or were they not called to meet by the Commission?

CHAIRMAN NOWALSKY: I'll go to Toni.

MS. TONI KERNS: They haven't been called upon to meet; because we haven't had any actions to bring forward to the Panel, because there has been a moratorium for the last 20 years.

MS. DAVIDSON: Any actions that have been taken for Atlantic sturgeon since 1998, the Panel was not just called to participate.

CHAIRMAN NOWALSKY: This Board has not had any management actions. Obviously there have been actions that have taken place at the Federal level. This Board has not asked formally for the AP to provide comment through the Board to the entities that are enacting those actions. Those AP members that remain have had the ability to, and I'm sure some have, directly commented on it. But we as a Board have not asked them to provide us and then provided that comment on.

MS. DAVIDSON: Thank you.

CHAIRMAN NOWALSKY: **Okay, so let's go ahead and take a vote on this. Move to disband the Atlantic sturgeon Advisory Panel; motion by Mr. White, seconded by Mr. Kane. All those in favor please raise your right hand. Thank you, you can put your hands down. All those opposed, abstentions, null votes; motion carries 17 to 0 to 0 to 0.**

ADJOURNMENT

CHAIRMAN NOWALSKY: Is there any further business to come before the Board today? Seeing no further business; and having completed the agenda as it was presented, this Board stands adjourned, thank you very much.

(Whereupon the meeting adjourned at 11:40 o'clock a.m. on August 8, 2018)

Atlantic States Marine Fisheries Commission

2024 Atlantic Sturgeon Stock Assessment Update

For Board Review

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

Atlantic Sturgeon Stock Assessment Update

Prepared by the ASMFC Atlantic Sturgeon Stock Assessment Subcommittee:
Kristen Anstead, Atlantic States Marine Fisheries Commission
Jason Boucher, NOAA Fisheries
James Boyle, Atlantic States Marine Fisheries Commission
Michael Celestino, New Jersey Division of Fish and Wildlife
Margaret Conroy, Delaware Division of Fish and Wildlife
Katie Drew, Atlantic States Marine Fisheries Commission
Jared Flowers, Georgia Department of Natural Resources
Dewayne Fox, Delaware State University
Nathaniel Hancock, North Carolina Division of Marine Fisheries
Amanda Higgs, New York Department of Environmental Conservation
Bill Post, South Carolina Department of Natural Resources
Eric Schneider, Rhode Island Department of Environmental Management
David Secor, University of Maryland Center for Environmental Science
With support from
Laura Lee, US Fish and Wildlife Service
Rich Pendleton, New York Department of Environmental Conservation
Ellen Waldrop, South Carolina Department of Natural Resources
And the ASMFC Atlantic Sturgeon Technical Committee:
Kristen Anstead, Atlantic States Marine Fisheries Commission
Jacque Benway Roberts, Connecticut Department of Energy and Environmental Protection
Bryant Bowen, Georgia Department of Natural Resources
James Boyle, Atlantic States Marine Fisheries Commission
Ingrid Braun-Ricks, Potomac River Fisheries Commission
Christopher Davis, Virginia Marine Resource Commission
Katie Drew, Atlantic States Marine Fisheries Commission
Syma Ebbin, University of Connecticut
Catherine Fede, New York Department of Environmental Conservation
Dewayne Fox, Delaware State University
Greg Garman, Virginia Commonwealth University
Nathaniel Hancock, North Carolina Division of Marine Fisheries
Amanda Higgs, New York Department of Environmental Conservation
Ashlee Horne, Maryland Department of Natural Resources
Luke Lyon, District of Columbia Fisheries and Wildlife Division
Steve Minkkinen, US Fish and Wildlife Service
Brian Neilan, New Jersey Division of Fish and Wildlife
Ian Park, Delaware Division of Fish and Wildlife
Eric Schneider, Rhode Island Department of Environmental Management
David Secor, University of Maryland Center for Environmental Science
Ellen Waldrop, South Carolina Department of Natural Resources
Mike Wicker, US Fish and Wildlife Service
John Sheppard, Massachusetts Division of Marine Fisheries
Danielle Dyson, New Jersey Division of Fish and Wildlife
Mike Mangold, US Fish and Wildlife Service

A publication of the Atlantic States Marine Fisheries Commission pursuant to National Oceanic and Atmospheric Administration Award No. NA20NMF4740012.

ACKNOWLEDGEMENTS

The Atlantic States Marine Fisheries Commission thanks all of the individuals who contributed to the development of the Atlantic sturgeon stock assessment update, including the ASMFC Atlantic Sturgeon Technical Committee (TC) and Stock Assessment Subcommittee (SAS) members who provided data and developed the stock assessment update report. The Commission thanks David Kazyak (U.S. Geological Survey Eastern Ecological Science Center) for substantive contributions to this report, including provision of genetic assignments used in the acoustic telemetry model, extensive input on research recommendations, and feedback on draft versions of this document, and Rich Pendleton (New York Department of Environmental Conservation) for additional help developing abundance indices.

The Commission also expresses deep gratitude to the many individuals outside the TC and SAS who contributed telemetry data for the survival model, including Matt Balazik (Virginia Commonwealth University), Adam Fox (University of Georgia), Eric Hilton (Virginia Institute of Marine Science), Micah Kieffer (USGS Eastern Ecological Science Center), Pat McGrath (Virginia Institute of Marine Science), and Gayle Zydlewski (University of Maine). The Commission also thanks Barb Lubinski, Robin Johnson, Cassia Busch, and Shannon White of the USGS Eastern Ecological Science Center for their efforts to genotype and assign telemetered sturgeon, and Matt Breece (University of Delaware) for assistance with obtaining the tagging data.

EXECUTIVE SUMMARY

The purpose of this assessment was to update the 2017 Atlantic Sturgeon Benchmark Stock Assessment and Peer Review Report (ASMFC 2017) with recent data from 2016-2022. Data from a variety of fisheries-dependent and independent sources were used to develop bycatch, effective population size, and mortality estimates.

Several states closed their Atlantic sturgeon fisheries in the mid to late 1990s, and a coastwide moratorium was implemented in 1998, ending the directed Atlantic sturgeon landings time series. For this assessment, bycatch in other fisheries was quantified from federal observer programs from Maine to North Carolina and in North and South Carolina from other fishery programs. Bycatch data begins in the 2000s and estimates of Atlantic sturgeon bycatch have generally been decreasing in recent years, with the exception of estimates from gill nets from the federal program.

Nine fishery-independent surveys were developed into indices of relative abundance for Atlantic sturgeon. Most indices either had no trend over the time series or were increasing. The individual indices were combined to develop a coastwide index of relative Atlantic sturgeon abundance. The coastwide index is variable from 1990-2022 but has been steadily increasing since 2013.

Estimates of total mortality (Z) produced from an acoustic tagging model were compared to total mortality thresholds defined as the value of total mortality, Z, that results in an egg-per-recruit (EPR) that is 50% of the EPR of an unfished stock, $Z_{50\%EPR}$, at both the coastwide and DPS-level. Total mortality was low for the coastwide population. For individual DPSs, the Gulf of Maine had the highest Z estimates whereas the Chesapeake Bay had the lowest Z estimates.

Stock status determination was made qualitatively relative to historical abundance and quantitatively relative to 1998 (or, for surveys that started after 1998, the first year of the survey), the start of the coastwide moratorium when more quantitative datasets were available. The terminal year index values of the selected fisheries-independent surveys were compared to the index value that occurred during 1998 to evaluate whether abundance was higher or lower than at the start of the moratorium. At the coastwide level, while Atlantic sturgeon remain depleted relative to historic levels, the composite index had a 100% probability of being above the 1998 value and a significant positive trend over the time series, and the probability of total mortality being above the total mortality threshold was less than 2%.

At the individual DPS level, results were more mixed. Individual indices varied, with slightly more than half having a greater than 50% chance of being above the reference year value; most indices showed a positive or no significant trend. The average probability of being above the reference year was greater than 50% for the New York Bight and the Carolina indices, and less than 50% for the other indices, similar to the results of the 2017 assessment. The Gulf of Maine

DPS had a 55.5% probability of annual Z being above the Z threshold, but all other DPSs had a less than 50% probability of exceeding the Z threshold.

Population	Mortality Status	Biomass/Abundance Status		
	$P(Z)>Z_{50\%EPR}$ Reference Point	Relative to Historical Levels	NOAA Designation	Average probability of terminal year of indices > reference year*
Coastwide	1.80%	Depleted		100%
Gulf of Maine	55.50%	Depleted	Threatened	45%
New York Bight	20.20%	Depleted	Endangered	59%
Chesapeake Bay	14.10%	Depleted	Endangered	27%
Carolina	18.20%	Depleted	Endangered	77%
South Atlantic	26.50%	Depleted	Endangered	31%
***Reference year is 1998, or the first year of the survey for indices that started after 1998**				

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

This Terms of Reference (TOR) report describes the update to the most recent benchmark stock assessment for Atlantic sturgeon (ASMFC 2017). This assessment extends the fishery-independent and –dependent data for Atlantic sturgeon through 2022, reruns the tagging, autoregressive integrated moving average (ARIMA), and egg-per-recruit models and estimates annual bycatch and total mortality. Stock status is determined using the total mortality reference point defined and accepted for management use in 2017.

Atlantic sturgeon are categorized into five distinct population segments (DPS): Gulf of Maine, New York Bight, Chesapeake Bay, Carolina, and South Atlantic (Figure 1). The DPSs have different physical, genetic, and physiological characteristics (NOAA 2012a). The SAS note that while surveys used in this assessment are categorized by DPS, they are likely catching a mixed population. The SAS is making the assumption, based on genetic work (Kazyak et al. 2021), that the surveys encounter predominantly Atlantic sturgeon from populations which spawn nearby, but some Atlantic sturgeon from other DPSs may be mixed in as well.

TOR 1. Fishery-Dependent Data

Update fishery-dependent data (landings, discards, catch-at-age, etc.) that were used in the previous peer-reviewed and accepted benchmark stock assessment.

Several states closed their Atlantic sturgeon fisheries in the mid to late 1990s, and a coastwide moratorium was implemented in 1998, ending the directed Atlantic sturgeon landings time series. Historical commercial landings are available in ASMFC 2017.

However, Atlantic sturgeon are still caught as bycatch in fisheries for other species. Estimates of Atlantic sturgeon bycatch are available from federal and state data collection programs and were updated for this assessment.

a. Northeast Fishery Observer Program Bycatch Estimates

Following the approach used by Miller and Shepherd (2011), Miller (2015), Curti (2016), and Boucher and Curti (2023), the same generalized linear model (GLM) framework with quasi-poisson assumption was used for modeling Atlantic sturgeon takes as a function of the trip-specific species mix, year, and quarter factors. In Miller and Shepherd (2011), the "species mix" was comprised of those species currently managed with federal fishery management plans. In this analysis, the modifications applied in ASMFC 2017 were followed, where the "species mix" covariates were those species caught most on observed hauls encountering Atlantic sturgeon.

The selected model for each gear type was applied to vessel trip reports to predict Atlantic sturgeon take for all trips. The new NEFSC/GARFO Catch Accounting and Monitoring System (CAMS) was not used to develop the estimates, to be more consistent with the methods used in the 2017 benchmark assessment. The total bycatch of Atlantic sturgeon from bottom otter trawls ranged between 478 – 1,187 fish over the time series (Table 1). The proportion of the

encountered Atlantic sturgeon recorded as dead ranged between 0 – 18% and averaged 4%. This resulted in annual dead discards ranging from 0 – 212 fish. Likewise, the total bycatch of Atlantic sturgeon from sink and drift gillnets ranged from 281 – 1,583 fish (Table 2). The proportion of Atlantic sturgeon recorded as dead ranged between 12 – 51% and averaged 30%, resulting in annual dead discards ranging from123 – 594 fish. The estimates from the updated model for this assessment were very similar to the estimates from the benchmark model for both gears (Figure 3). The percent of dead sturgeon in both otter trawls and gillnets was higher in 2021-2022 than it was in earlier years, but observer coverage was lower in 2021-2022, resulting in higher uncertainty around the estimates.

b. North Carolina Atlantic Sturgeon Bycatch Estimates from the Estuarine Gill Net Fishery

A GLM framework was used to predict Atlantic sturgeon interactions in North Carolina's estuarine gill net fishery based on data collected during 2013-2022 using the same methods as ASMFC 2017 although the time period of data has changed. Since 2017, the bycatch database in North Carolina has improved and their Protected Resources Section no longer recommends using the data from 2004-2012 as was done in the benchmark. For this update, only the data from 2013-2022 was used. The best-fitting GLM was a zero-inflated Poisson model with an offset for trips that used year, season, management unit, and mesh size in the count part and year, management unit, and mesh size in the zero-inflated part. Atlantic sturgeon bycatch in North Carolina's estuarine gill net fishery reached a high of 1,413 Atlantic sturgeon in 2015 and a low of 119 in 2019 (Table 3). In general, the Atlantic sturgeon bycatch in this fishery has decreased over time, due in part to additional regulations on the gillnet fishery to minimize bycatch of Atlantic sturgeon as a result of the ESA listing.

c. South Carolina Atlantic Sturgeon Bycatch Estimates from the American Shad Fishery

Following the methods of ASMFC 2017, Atlantic sturgeon bycatch estimates in South Carolina were estimated. Between years 2000-2022, a total of 1,728 Atlantic sturgeon were reported in the Winyah Bay and Waccamaw, Great Pee Dee, and Santee Rivers American shad fisheries (Table 4). Previous observer coverage indicated that the vast majority of sturgeon caught in this fishery are alive when released, as the fishery occurs in the spring when the water temperatures are cooler. Therefore, all sturgeon reported as bycatch are assumed to be released alive unless specifically reported dead. Based on genetic makeup and ecological groupings included in the recent 2012 listing of the Atlantic sturgeon to the Endangered Species List, these rivers are part of the Carolina DPS (NOAA 2012a). Average effort during the same time series equaled 3,342,073 net yard hours with an average catch per unit effort (CPUE) of 0.0000035 Atlantic sturgeon per net yard hours. It is also important to note, since shad regulation changes in 2013 as part of requirements of South Carolina's Shad Sustainably Plan, reported numbers of Atlantic sturgeon for Carolina DPS rivers decreased by 30% and CPUE decreased by 38%. These are notable decreases to already low levels of overall impact.

Between years 2000-2022 a total of 69 Atlantic sturgeon were reported in the Edisto, Combahee, and Savannah Rivers shad fisheries (Table 4). Based on genetic makeup and ecological groupings included in the recent 2012 listing of the Atlantic sturgeon to the Endangered Species List, these rivers are part of the South Atlantic DPS (NOAA 2012a). Average effort during the same time series equaled 261,195 net yard hours with an average CPUE of 0.0000016 Atlantic sturgeon per net yard hours. It is important to note, since shad regulation changes in 2013 as part of requirements of South Carolina's Shad Sustainably Plan, reported numbers of Atlantic sturgeon for South Atlantic DPS rivers was one fish. These are also notable decreases to already low levels of overall impact. This combined with overall declining effort suggests by-catch in this fishery may not be a concern to sturgeon populations in these rivers.

TOR 2. Fishery-Independent Data

Update fishery-independent data (abundance indices, age-length data, etc.) that were used in the previous peer-reviewed and accepted benchmark stock assessment.

As noted in ASMFC 2017, Atlantic sturgeon are not often encountered by fishery-independent surveys. Nine surveys were developed into indices of relative abundance and were standardized using generalized linear models. Because of low positive tows, several surveys used a binomial error structure as recommended by the Peer Review Panel (Table 5). Indices were combined for a coastwide index of relative Atlantic sturgeon abundance using the Conn method (Conn 2010). The coastwide index is variable from 1990-2022 but has been steadily increasing since 2013 (Figure 4). Individual survey plots can be found in the Appendix (Figure A6 - Figure A22).

A power analysis was completed on the abundance indices (ASMFC 2017; Gerrodette 1987). Median coefficients of variation (CVs), or proportional standard error, ranged from 0.14–1.15 for the surveys analyzed and power values ranged from 0.13 to 1.00 (Table 6). The Maine-New Hampshire Trawl had the lowest power and the South Carolina Edisto Sturgeon Monitoring Project Survey had the highest power to detect a 50% increase or decrease in abundance. The results were similar to the benchmark (ASMFC 2017).

TOR 3. Life History Information

Tabulate or list the life history information used in the assessment and/or model parameterization (M, age plus group, start year, maturity, sex ratio, etc.) and note any differences (e.g., new selectivity block, revised M value) from benchmark.

The life history information used to parameterize the eggs-per-recruit (EPR) reference point model was the same as used in the benchmark. The median life history information is presented in Table 7.

TOR 4. Models

Update accepted model(s) or trend analyses and estimate uncertainty. Include sensitivity runs and retrospective analysis if possible and compare with the benchmark assessment results. Include bridge runs to sequentially document each change from the previously accepted model to the updated model.

a. Tagging Model

The tagging analysis from ASMFC (2017) was repeated to estimate annual survival of telemetry tagged Atlantic sturgeon. The dataset consisted of tag detection data for Atlantic sturgeon tagged and observed on receiver arrays across the Atlantic coast. Detection data from the 2017 assessment was updated to included additional detections and tags through the time period ending in 2022. Tagged Atlantic sturgeon were individually assigned a DPS based on genetics if a genetic assignment was available, then location of tagging if genetics were unavailable (Table 8). Tagged individuals were separated into two groups for size-at-tagging, subadults (<1,300 mm) and adults (>1,300 mm), with the break approximating size at maturation. The benchmark assessment only looked at parameter estimates over a single block of time, but for this update both single and dual time stanzas were evaluated. Based on the pattern in tag detections, representing shifts in effort across DPSs, a cutoff date of December 2015 was used to split detections into early (2006-2015) and late periods (2016-2022).

The Cormack-Jolly-Seber model and estimated parameters, detection probability (*P*) and annual survival (*S*), were the same as in the benchmark model. Similarly, scenario runs used 2,500 burn-in and 10,000 model iterations and best performing models were selected using Deviance Information Criterion (DIC). The scenarios evaluated by the model included those from the benchmark assessment and the additional early and late time blocks.

The best model for each DPS and size group varied, with a single estimate of *P* performing better for certain DPSs, while monthly DPS estimates were better for others. Size groups showed less of a pattern for *P*. Models using the early and late *S* blocks were less supported than those using single blocks, and the *S* estimates did not vary greatly between times. The peer review from the benchmark assessment recommended presenting the median, instead of mean, value of the posterior distribution for estimates, due to skewing in the distributions related to sample size.

Total mortality (*Z*) was calculated from survival using the equation:

$$Z = -\ln(S)$$

Overall, estimates of *Z* were similar to those in the benchmark assessment, in most cases equal or lower. Across DPSs, *Z* was also similar, although the Gulf of Maine DPS was somewhat higher (Table 9; Figure 5-Figure 10). Atlantic sturgeon migrate over large areas throughout their subadult and adult stages (Kazyak et al. 2021) and mortalities may occur beyond the geographic area associated with a specific DPS. Therefore, the DPS-specific estimates represent estimates for individuals originating from the DPS, rather than the conditions within the geographic area

associated with the DPS itself. Subadult *Z* was also generally higher than adult *Z*; see Appendix A for more detailed results.

The number of tags available were greatly increased over the benchmark, improving estimates, but the tagging model was still sensitive to sample size, notably in the results for the Gulf of Maine DPS. Importantly, many tagged Atlantic sturgeon originate through shorter-term studies that are focused on answering specific research questions and may not have steady funding. Continued application of this model will require continued operation of acoustic telemetry arrays and ongoing deployment of acoustic tags. Improved tagging and detection data could also lead to future model improvements as additional modeling aspects, such as covariates, or finer resolution temporal or spatial parameter estimates can be developed.

b. Stochastic Eggs-per-Recruit (EPR) Model

During the update, a revision was made to how uncertainty was parameterized for the stochastic EPR model used to estimate the *Z* reference point. This revision made the standard deviation of the drawn parameters align more closely with the published values where available when parameters were drawn from a lognormal distribution. Otherwise, the parameterization of the model was the same as in the benchmark assessment. Median selectivity values for the bycatch and ship strike fleets are presented in Table 7.

The adjustment to the uncertainty parameterization had a negligible effect on the overall distribution for the $Z_{50\%EPR}$ reference point compared to the benchmark values. The 80th percentile of the $Z_{50\%EPR}$ distribution is used as the reference point and was equal to 0.14.

c. Mann-Kendall Test

Analyses from ASMFC (2017) were repeated with raw updated indices. For ASMFC (2017), only one index, North Carolina Program 135's (NC p135) spring index for juveniles, had a significant (increasing) trend (α = 0.05). For the present report, the following raw indices had increasing trends: New Jersey Ocean Trawl, NC p135's spring index for young-of-the-year (YOY) and juveniles, NC p135's spring index for juveniles, NC p135's fall index for YOY and juveniles, NC p135's fall index for juveniles, and the Conn index (Table 12). No survey had a significant declining trend.

d. ARIMA

The fishery-independent indices were analyzed using the autoregressive integrated moving average (ARIMA) methods described in ASMFC (2017) with the following changes:

- In 2017, only contiguous years of a survey index with no missing index values were used in ARIMAs (Figure 11); due to COVID and other reasons (e.g., vessel mechanical issues), sampling for several surveys was suspended during at least 2020 and so for the present assessment, the ARIMA code (the *surveyfit* and *surveyref* functions from the *fishmethods* package) was modified to allow missing values; the bootstrapping routine

within *surveyref* was also modified so that missing years of data always had missing data and no additional missing years were added via re-sampling.

- Given the variability in available terminal years relative to ASMFC 2017 (Figure 11), the data was not subset to a common set of years as a sensitivity analysis. The goal of this sensitivity analysis in 2017 was to determine whether the comparison of the terminal year to the 25th percentile of the time series was sensitive to the specific years over which the 25th percentile was calculated. For the present analyses, due to COVID and other issues, surveys have variable terminal years and years missing adjacent to terminal years, and so the SAS found this sensitivity analysis to be less relevant (i.e., trimming surveys to a common terminal year would only add four additional years to ASMFC (2017), resulting in a terminal year of 2019, approximately 5 years ago – this was judged to be of little use).

Consistent with ASMFC (2017), probabilities greater than or equal to 0.50 were considered credible evidence that an index value was greater than a reference point.

Descriptive statistics for all model runs are provided in Table 11. When adjusted for multiple tests (Holm 1979; RCT 2017), residuals from all model fits were normally distributed, except for the South Carolina Edisto Sturgeon Monitoring Project Survey (SC Edisto).

Fitted indices, grouped by DPS, are plotted in Figure 13 - Figure 15. Plots of ARIMA fits with reference values are provided in the Appendix (Figure A1). Significant trends (Holm-adjusted *p*-values ≤ 0.05) are summarized in Table 12 and reported below.

Comparison of ARIMA fits from 2024 with those generated in 2017 are provided in Figure 16. Direct comparison of index fits is complicated by index model structures changing in some instances (e.g., GLM vs generalized additive model, or GAM, for New York State Department of Environmental Conservation Juvenile Atlantic Sturgeon Abundance Monitoring Program, or NY JASAMP) and additional years of data becoming available (e.g., Connecticut Long Island Sound Trawl Survey, or CT LIST, in the spring) due to changes in ARIMA methodology from ASMFC (2017; e.g., allowance for missing years of data).

All ARIMAs were credibly above their respective 25th percentiles of abundance except for the CT LIST for the index using all months and the Virginia Institute of Marine Science (VIMS) Shad and River Herring Monitoring Survey in the James River in the spring (Table 12). The situation was more mixed when considering terminal year fits compared to the fitted index from 1998 (or the first year of the survey). When including all indices, the terminal year for 7 of 18 indices were not above the 1998 (or surrogate) value. As was done in ASMFC (2017), because some survey indices, when subset to different ages or months, are strongly correlated with each other, 'duplicative' surveys were removed for final status determination. In this case, for the group of NC p135 spring indices, the juvenile index was strongly correlated with both the YOY and the YOY and juvenile indices (while those two indices were not strongly correlated with each other). Since the indices are not lagged, only the YOY and juvenile index was removed, since similar information is contained in the individual indices. For the group of NC p135 fall

indices, all three indices were strongly correlated with each other. Following the reasoning for NC p135 spring indices, YOY and juvenile indices was removed. With these adjustments, 7 of 16 indices were not above their respective fitted 1998 (or surrogate) index value. See Table 13 for results summarized by DPS, or Table 12 for individual survey results.

Results from the reverse retrospective analysis are provided in Figure 17 - Figure 18. Figure 17 suggests that the terminal year comparisons with the 25th percentile of the CT LIST index for all months, CT LIST spring index, NY JASAMP, and VIMS (James River only) indices are all somewhat sensitive to the start year of the survey. In each of those surveys, except for NY JASAMP, the probability of being above the 25th percentile of abundance tends to increase with later starts in the survey – this is an intuitive result as early years of these surveys tended to have relatively high index values, and so as those years are sequentially removed, the 25th percentile of the time series drops, making it more likely that the terminal year will exceed that value.

Figure 18 suggests that the conclusions with respect to comparisons with the index value in 1998 (or start year of the survey for surveys that began after 1998) for CT LIST index using all months, CT LIST index in the spring, Maine-New Hampshire Inshore Groundfish Trawl Survey (ME-NH Trawl), SC Edisto, US Fish and Wildlife Cooperative Tagging Cruise (USFWS), and both VIMS indices are all somewhat sensitive to the start year of the survey. The reasons for this may be similar to those stated above – early years of these indices tend to have comparatively large values with wide swings in abundance, the removal of which can have a strong influence on the ARIMA trend.

A correlation matrix of all ARIMA fits is provided in Figure 19. Index fits in the New York Bight DPS are uncorrelated or negatively correlated with each other. Index fits in the Chesapeake Bay DPS are uncorrelated with each other. Index fits in the Carolina DPS are uncorrelated or positively correlated with each other. The Northeast Area Monitoring and Assessment Program Trawl Survey (NEAMAP), which corresponds to the New York Bight, Chesapeake Bay, and Carolina DPSs, is uncorrelated with all index fits, save CT LIST index for the fall; the Conn index fit is positively correlated with all Carolina DPS index fits, and the New Jersey Ocean Trawl fit, but uncorrelated or negatively corelated to the remainder of the index fits. See Figure 19 for relationships among all survey fits.

For detailed DPS- and index-specific results, see Appendix C.

TOR 5. Stock Status

Update the biological reference points or trend-based indicators/metrics for the stock. Determine stock status.

Atlantic sturgeon was designated as a federally endangered species in 2012 (Federal Register 2012). However, there remains no estimates of unexploited biomass or abundance at the coastwide or DPS-level against which to evaluate Atlantic sturgeon status, and estimates of current abundance are limited to a few rivers. Also, for a species that has been under a

moratorium for nearly twenty years, the traditional “overfished” and “overfishing” status designations are not as meaningful.

For this assessment, quantitative stock status was determined from the probability of the estimate of total mortality from the tagging model being greater than the $Z_{50\%EPR}$ reference point and the probability that the terminal year of the indices for a given DPS was greater than the reference year for each index, as evaluated by the ARIMA analysis. Because the available indices only cover the most recent time period, long after the height of exploitation, metrics like trends in landings and consideration of anecdotal reports of historical distribution and abundance were used to determine a qualitative biomass or abundance status relative to historical levels.

For total mortality, the distributions of the annual estimate of *Z* from the tagging model were compared to the total mortality EPR reference point to determine the probability of total mortality for the coast and for each DPS being above the reference point. The 80th percentile of the stochastic $Z_{50\%EPR}$ estimate for the coast was used as the reference point. Total mortality was low for the coastwide population; median annual *Z* was estimated to be 0.01 for 2006-2022, with only a 1.8% chance that *Z* was higher than the *Z* reference point (Table 9, Figure 5).

At the individual DPS level, estimates of survival were lower and estimates of *Z* were higher, due to the lower sample size and the broader parameter distributions (Table 9, Figure 6 -Figure 10). The Gulf of Maine had the highest median annual *Z* at 0.15, with a 55.5% probability of being above the *Z* threshold. The New York Bight DPS median annual *Z* was 0.06, with a 20.2% probability of being above the *Z* threshold. The Chesapeake Bay DPS had a median annual *Z* of 0.05, with a 14.1% probability of being above the *Z* threshold. The Carolina DPS had a median annual *Z* of 0.05, with an 18.2% probability of being above the *Z* threshold. The South Atlantic DPS had a median annual *Z* of 0.07 with a 26.5% probability of being above the *Z* threshold. Overall, the probability of exceeding the *Z* threshold was lower for the coast and for all DPSs than was estimated for the 2017 benchmark assessment. The two time-block model had less statistical support than the single time-block model, so this lower probability may result from an improved ability to estimate *Z* in the update, with the larger sample size and longer time series, rather than a reduction in *Z* in recent years. In all DPSs and at the coastwide level, Atlantic sturgeon were determined to be depleted relative to historical levels, a term that acknowledges the impact of not just directed fishing mortality, which has ceased since 1998, but other factors such as bycatch mortality, ship strikes, and reductions in productivity due to habitat loss.

At the coastwide level, while Atlantic sturgeon remain depleted relative to historic levels, the composite index had a 100% probability of being above the 1998 value and a significant positive trend over the time series, and the probability of total mortality being above the total mortality threshold was less than 2% (Table 14).

At the individual DPS level, results were more mixed (Table 14). Individual indices varied, with slightly more than half having a greater than 50% chance of being above the reference year value; most indices showed a positive or no significant trend (Table 13). The average probability

of being above the reference year was greater than 50% for the New York Bight and the Carolina DPSs, and less than 50% for the other DPSs, similar to the results of the 2017 assessment. The Gulf of Maine DPS had a 55.5% probability of annual *Z* being above the *Z* threshold, but all other DPSs had a less than 50% probability of exceeding the *Z* threshold (Table 14).

Atlantic sturgeon is a data-limited species, and there are several limitations and sources of uncertainty in the datasets used in this assessment that should be taken into account when evaluating stock status. Even though *Z* has a low probability of exceeding the *Z* reference point at the coastwide level, sources of mortality like bycatch and ship strike mortality may not be affecting each DPS or even each river within a DPS equally. Only half of the tagged fish were able to be assigned to a DPS based on genetics; the rest were assigned based on where they were tagged. This makes the estimates of *Z* at the DPS level less reliable, as fish from other DPSs are likely mixed with the true DPS fish in the analysis. In addition, the tagging model is predominately measuring *Z* on adult fish, based on the size of the fish in the model and the time at large, and mortality on juveniles may be higher. For abundance trends, the probability of a DPS being above or below the reference level is based on a limited number of surveys for each DPS. Indices are assigned to a DPS based on where the survey occurs, not on the genetics of the fish caught by that survey. While genetic work (Kazyak et al. 2021) suggests that the surveys encounter predominantly Atlantic sturgeon from populations which spawn nearby, some Atlantic sturgeon from other DPSs may be mixed in as well, potentially confounding some of the trends reported for each DPS.

In addition, tag data and indices were not available for all rivers within each DPS, so the results reported here represent only the component of each DPS, and the coastwide population, that are represented in the available data.

TOR 6. Projections

Conduct short term projections when appropriate. Discuss assumptions if different from the benchmark and describe alternate runs.

Projections cannot be conducted with the models used in this assessment.

TOR 7. Research Recommendations

Comment on research recommendations from the benchmark stock assessment and note which have been addressed or initiated. Indicate which improvements should be made before the stock undergoes a benchmark assessment.

a. Progress on Benchmark Research Recommendations

Since the 2017 Atlantic sturgeon Benchmark Assessment, research and management information has been published on a variety of topics that help address research priorities. Appendix D lists the complete list of research recommendations from ASMFC 2017.

High Priority Recommendations

Identify spawning units along the Atlantic coast at the river or tributary and coast-wide level.

Significant progress has been made towards identifying and characterizing extant spawning units along the Atlantic Coast since the last benchmark stock assessment. Two studies found evidence of small breeding populations in rivers that had not been documented prior. Savoy et al. (2017) found evidence of breeding in the Connecticut River by a limited number of breeders, which appear to have originated from much more southern locations. These results indicate that re-colonizers of extirpated populations may not necessarily come from nearby populations. Secor et al. (2022) studied spawning in the Nanticoke River-Marshyhope Creek (Chesapeake Bay), finding a small adult population with a small effective population size genetically (N_e = 12.2, 95% CI = 6.7-21.9) and small spawning runs (<100 adults; Coleman et al. 2024). In addition to these field studies, molecular analysis found evidence of distinct spring- and fall- spawning populations in the Pee Dee and Ogeechee Rivers (White et al. 2021). Despite this progress, there are likely still additional spawning populations which have not yet been formally documented, particularly within the Carolina DPS.

Expand and improve the genetic stock definitions of Atlantic sturgeon, including developing an updated genetic baseline sample collection at the coast-wide, DPS, and river-specific level for Atlantic sturgeon, with the consideration of spawning season-specific data collection.

Several studies have advanced our knowledge of genetic stocks of Atlantic sturgeon. Farrae et al. (2017) found that fall- and spring-spawned Atlantic sturgeon in the Edisto River are genetically distinct but both with high genetic diversity indicating lack of inbreeding and lack of recent bottlenecks. White et al. (2021) published a genetic baseline for Atlantic sturgeon, consisting of representative individuals from 18 genetically distinct groups collected in 13 rivers and one estuary. This baseline includes discrete spring- and fall-spawning populations from four rivers. In most cases, genetic differentiation was lower within DPSs versus among populations from separate DPSs. A notable finding from White et al. (2021) was that populations that spawn in the same season (i.e., spring or fall) are often more similar than populations which spawn within the same river. The White et al. (2021) baseline is currently being used by the U.S. Geological Survey, NOAA Fisheries, and US Army Corps of Engineers to allocate take to specific DPSs to support federal management of Atlantic sturgeon under the Endangered Species Act. The U.S. Geological Survey is continuing to expand and augment this genetic baseline, with ongoing efforts to improve stock characterization in the South Atlantic and Carolina DPSs, as well as populations which spawn in Canadian rivers. Wirgin et al. (2023) used microsatellite analysis to estimate the genetic population structure of Atlantic sturgeon from 13 spawning rivers from St. Lawrence River, Quebec, to Satilla River, Georgia, and found two distinct genetic clusters of juveniles in Ogeechee River, Georgia (spring- and fall-spawned) differing significantly in mean total length and evidence that one cluster is resident while the other is highly migratory. The Savannah and Altamaha River populations showed no such partitioning.

Our enhanced understanding of genetic population structure in Atlantic sturgeon has been leveraged to improve our characterization of stock composition in habitats where mixing may occur. For example, Wirgin et al. (2018) studied the genetics of 148 subadult Atlantic sturgeon collected in the tidal Hudson River estuary and 8 dead specimens found floating (likely victims of vessel strikes) and found 142 live and all 8 dead were Hudson River (New York Bight DPS), 2 Kennebec River (Gulf of Maine DPS), 2 Delaware River (New York Bight DPS), 1 Ogeechee River (South Atlantic DPS) and one James River (Chesapeake Bay DPS). This result does not differ markedly from the retrospective mixed-stock analysis on the New York Bight fishery fin spines collected 30 years ago which suggest the fishery primarily harvested individuals from the Hudson River population, with a few from at least eight other populations (White et al. 2021).

Kazyak et al.'s (2021) mixed-stock microsatellite analysis of 1,704 Atlantic sturgeon found extensive stock mixing in the mid-Atlantic with individuals from all five regions were commonly observed (north of Cape Cod, Massachusetts, and south of Cape Hatteras, North Carolina, stocks were dominated by individuals from regional stocks). Subadults and adults encountered in offshore environments had moved 277 km on average from their natal source with 23% being found over 500km from their natal source.

Wirgin et al. (2023) conducted individual-based assignment testing on 1,512 Atlantic sturgeon from coastal environments, focusing their analysis on individuals which demonstrated affinity to the South Atlantic DPS. Their analysis found a disproportionate contribution from one of the genetic groups from the Ogeechee River, which the authors interpreted to suggest significantly different migratory strategies (i.e., resident and highly migratory).

White et al. (2023) reported individual-based assignment testing results for 329 Atlantic sturgeon which were encountered as mortalities or taken during federally-permitted activities. The majority of these animals assigned to the Hudson River population, with substantial additional contributions from the James River (fall-spawning) and Delaware River populations. Nonetheless, a considerable number of individuals originated from distant populations from the southeastern United States.

White et al. (2024) examined the composition of >500 juvenile and subadult Atlantic sturgeon captured during monitoring surveys at Haverstraw Bay from 2017-2022. The majority of these fish assigned to the Hudson River population, and there were no patterns of natal origin with respect to sex, size, or age. This work indicates that the long-term survey data collected at this location primarily reflects demographic trends in the Hudson River population.

> *Determine habitat use by life history stage including adult staging, spawning, and early juvenile residency; expand the understanding of migratory ingress of spawning adults and egress of adults and juveniles along the coast.*

The frequency of spawning and spawning population abundance has been examined to further our understanding since 2017. Breece et al. (2021) found that females spawn at much shorter mean intervals than historical literature suggests in the Hudson River with mean intervals between spawning periods 1.66 years for females and 1.28 years for males. Additionally, they

found significantly longer occupancy in the spawning grounds for males (45 days) than females (21 days). The authors documented that fish returned in September when water temperatures are 20 - 27°C and departed as fall temperatures declined below 20°C. They preferred hard bottom and spawned mostly on sand-cobble and cobble. Movement was higher at night and fish covered multiple spawning regions. Kazyak et al. (2020) integrated side-scan sonar with acoustic telemetry to estimate size of the 2014 spawning run for the Hudson River (N=466, 95% confidence interval = 310-745). If reported spawning intervals were taken into account, the estimate appears similar to the historical total adult population estimate by Kahnle et al. (2007). Vine et al. (2019a and 2019b) examined spawning abundance and migration cues in the Savannah River in South Carolina and Georgia using side-scan monitoring as an alternative to traditional mark-recapture techniques and found maximum daily spawner abundance between 35 and 55 individuals in the fall spawning season. Their conclusion is that directed flow regulation (e.g., intermittent flood pulsing) during key temperature thresholds may facilitate upriver movement and aid in the conservation of sturgeon. Acoustic monitoring and mixed-effects models in the Great Pee Dee River, North Carolina (Denison et al. 2023), indicated that discharge affected water temperature influencing migration initiation and upriver movement. Spring runs cued on rising temperature and high discharge, while fall runs cued on falling temperatures and low discharge. Analogously, in spring Atlantic sturgeon travelled further upriver when discharge was decreasing, while in the fall they travelled upriver when discharge was increasing. They migrated significantly further upstream in fall than spring.

Recent work by White et al. (2024) highlights the extent to which adult sturgeon utilize non-natal rivers. In the Delaware River, a significant proportion of sturgeon which are in freshwater reaches during the spawning season appear to be from other populations. However, despite the physical presence of non-natal adults in spawning reaches, the observed levels of genetic differentiation among population indicate that little effective gene flow is occurring.

Rulifson et al. (2020) tracked Atlantic sturgeon in a strategically placed acoustic array just south of Cape Hatteras where the continental shelf area is naturally constricted finding presence in fall, winter, and spring at approximately the same time as spiny dogfish which could be a problem for bycatch in the spiny dogfish fishery.

Collect DPS-specific age, growth, fecundity, and maturity information.

Several studies address Atlantic sturgeon growth. Kehler et al. (2018) observed hatchery fish marked with an oxytetracycline (OTC) marker and seven recaptures of wild fish and found that growth was different between spring and fall collections with two-part zone for each year of growth. They found mean growth rates of 0.3 mm/day and 2.4 g/day and were unable to effectively estimate fork lengths of age classes. Markin and Secor (2019), through a lab experiment, determined the strain (river of origin) does not support the existence of latitudinal counter gradient growth variation and growth differences are due to the thermal environment alone. They found that spring and fall spawning impacts to growth vary by latitude, predicting that fall spawning should not occur north of the Chesapeake DPS owing to a curtailed fall-winter growth season. They conclude that conservation success is "most sensitive to factors that influence first-year survival."

The Southern Division American Fisheries Society (SDAFS) held a workshop on Atlantic and Gulf sturgeon ageing as part of their 2024 Annual Meeting, which provided a forum for researchers to discuss their experience and challenges with ageing sturgeon. ASMFC is planning an ageing workshop and exchange for Atlantic sturgeon to develop a standardized protocol for processing and reading Atlantic sturgeon hard parts. The project has recently been revived to build on the discussions at the SDAFS meeting. The workshop is being planned for later in 2024 followed by a hard part exchange. This will provide better, more consistent life history information for the next benchmark, helping to address this research recommendation.

> *Collect more information on regional vessel strike occurrences, including mortality estimates. Identify hot spots for vessel strikes and develop strategies to minimize impacts on Atlantic sturgeon.*

Since 2017 several authors investigated ship strikes as a threat to Atlantic sturgeon. Fox et al. (2020) placed 164 carcasses along the shoreline of the Delaware River Estuary to estimate reporting rates and found overall reporting rate was 4.8% and only included areas easily accessible to the general public, such as beaches. Additionally, they found there was little movement of carcasses and no trends in number of carcasses along the shoreline from 2005-2019. They concluded that because reporting rates of Atlantic sturgeon carcasses are low, the magnitude of vessel strikes may be unsustainably high and directly impeding recovery. In related work, Fox and Madsen (2020) determined that sturgeon use the mouth of Delaware Bay heavily and could be directly (vessel strikes) or indirectly (disruption to foraging habitats) impacted by an increase in vessel traffic. DiJohnson (2019) investigated the influence of vessels on Atlantic sturgeon movement and found no evidence that Atlantic sturgeon behavior is affected by commercial shipping, but is more influenced by sediment type. Recent work by White et al. (2024) highlights the prevalence of non-natal sturgeon throughout the Delaware River and its estuary, suggesting that ship strikes in these areas may be impacting populations from a broad area of the coast.

Despite suggesting areas of focus for ship strike mortality, Kahn et al. (2023) estimated adult annual survival of 99.2% (95% confidence interval: 97.9-99.7%) in the York River, Chesapeake Bay, with 80% of the suspected mortalities' last detections occurring in a shipping channel.

Atlantic sturgeon are highly migratory with complex and not fully understood movement patterns. Two recent papers studied regional movement. Melnychuk et al. (2017) analyzed movement using acoustic telemetry and survival patterns with multi-state mark-recapture models finding that late spring is particularly sensitive period for Atlantic sturgeon along the coast of Long Island, New York. The authors suggest that managers could use real-time observations from acoustic telemetry to implement short fishery closures to reduce incidental mortality. Rothermel et al. (2020) used a gradient-based array of acoustic telemetry receivers on or near wind-farm lease areas off the coast of Maryland and Delaware to study both Atlantic sturgeon and striped bass movement. The highest incidence of Atlantic sturgeon was in spring and fall biased toward shallow regions. The incidence was often transient (mean =~2 days) with increased residency (>2 days) during autumn and winter, often concentrated in the lease areas

during the winter. No diel pattern among seasons was noted. Atlantic sturgeon appeared to select areas based on temperature and depth rather than specific benthic characteristics.

> *Establish regional (river or DPS-specific) fishery-independent surveys to monitor Atlantic sturgeon abundance or expand existing regional surveys to include annual Atlantic sturgeon monitoring. Estimates of abundance should be for both spawning adults and early juveniles at age. See Table 8 for a list of surveys considered by the SAS.*

Abundance estimates have been developed for several populations. White et al. (2022) investigated genetic-based estimates of breeding population size and how genotyping and sampling effort influence bias and precision. As an example, they evaluated the number of successful spawners (N_S) for the Delaware River breeding population of Atlantic sturgeon resulting in a breeding population three orders of magnitude below historic sizes (N_S likely between 125 and 250 adults). The pedigree-based approach to estimating breeding populations has several strengths including using juvenile genotypes which may be easier to obtain than adult and simulation analysis to objectively evaluate magnitude and direction of bias which can be used to optimize sampling and genotyping strategies.

Kazyak et al. (2020) integrated side-scan sonar with acoustic telemetry to estimate size of the 2014 spawning run for the Hudson River (N=466, 95% CRI = 310-745). If reported spawning intervals were taken into account, the estimate appears to similar to the historical total adult population estimate by Kahnle et al. (2007).

Coleman et al. (2024) developed a similar integrated side-scan sonar and acoustic approach to estimate spawning runs in the Marshyhope-Nanticoke River system (Chesapeake DPS), relying on an extensive telemetry array. Estimates were 32 (95% CRI=23-47) and 70 (95% CRI=49-105), respectively in 2020 and 2021. Both the Marshyhope Creek and upper Nanticoke River were extensively occupied by these spawning runs.

Kahn et al. (2019) used a suite of mark-recapture models to estimate the abundance of adult Atlantic sturgeon in the York River population. This study presents a series of annual abundance estimates from 2013-2018. The most recent population estimate (2018) using the Schumacher-Eschmeyer model indicated an abundance of 145 adults (95% CI: 89-381).

Vine et al. (2019) used *N*-mixture models to estimate the abundance of Atlantic sturgeon in the Savannah River using side-scan sonar and estimated the maximum daily spawner abundance (95% CI:35-55) within a portion of the river. However, this estimate is not a full census of spawning run size or overall adult abundance for this population.

> *Encourage data sharing of acoustic tagged fish, particularly in underrepresented DPSs, and support programs that provide a data sharing platform such as The Atlantic Cooperative Telemetry Network. Data sharing would be accelerated if it was required or encouraged by funding agencies.*

The Bureau of Ocean Energy Management funded a large collaborative synthesis of existing acoustic telemetry data (led by Matthew Breece, David Kazyak, and Dewayne Fox, in

partnership with many researchers) for Atlantic sturgeon which will wrap up in 2024. This effort helped to foster collaborative relationships among researchers, and also provided each participating researcher with a list of their tag detections from across a vast area.

> *Maintain and support current networks of acoustic receivers and acoustic tagging programs to improve the estimates of total mortality. Expand these programs in underrepresented DPSs.*

Although the number of tools which can leverage acoustic telemetry to provide management relevant insights into Atlantic sturgeon continue to grow (e.g., ASMFC 2017, Kazyak et al. 2020), the distribution of telemetry receivers continues to be ad hoc, and some important arrays have not been maintained. Many arrays are funded by specific grants and research questions, and consequently there are often not resources to main longer-term continuity. Maintenance and continued support of these arrays (and ongoing deployment of acoustic transmitters) is critical to enable continued application of mortality and abundance models used in the ASMFC Atlantic sturgeon assessment.

Moderate Priority Recommendations

> *Evaluate the effects of predation on Atlantic sturgeon by invasive species (e.g., blue and flathead catfish).*

Using a DNA-based approach, Bunch et al. (2021) examined the factors that influence first-year survival. Using gut contents to assess consumption of Atlantic sturgeon early life stages, they found eggs or days-old larvae in 4% of the samples from 23 fish species collected during September and October in the Pamunkey River, Virginia. The highest percent were found in common carp (*Cyprinus carpio*) and striped bass (*Morone saxatilis*). Six percent of blue catfish (*Ictalurus furcatus*) samples had target DNA.

> *Evaluate methods of imputation to extend time series with missing values. ARIMA models were applied only to the contiguous years of surveys due to the sensitivity of model results to missing years observed during exploratory analyses.*

The SAS considered the research recommendation from ASMFC 2017 to evaluate methods of imputation to extend time series with missing values. Imputation methods were explored but those methods were deprioritized once the ARIMA code was modified to allow for missing values (see TOR 3). The SAS might consider further exploration of imputation methods for comparison to results of ARIMAs with missing values.

b. New Research Recommendations

- Improve understanding of offshore habitat use, particularly in areas where offshore energy development and mineral removal are planned or occurring.

- Leverage species distribution models and acoustic telemetry data to identify key areas of occupancy along the coast throughout the year (for the species overall, and specific to each spawning population and DPS).

- Monitor for the potential presence of non-native sturgeon taxa throughout the native range of Atlantic sturgeon and evaluate potential risk of captive sturgeons to wild populations.

- Characterize the degree to which vessel strikes in specific rivers and estuaries may be impacting populations which spawn in other locations.

- Develop cost-effective strategies for long-term monitoring of Atlantic sturgeon.

- Evaluate strategies to reduce or mitigate mortalities from ship strikes. Improve understanding of how dredging may concentrate Atlantic sturgeon within high-traffic shipping channels and elevate risk of adverse interactions.

- If the NC p135 surveys are no longer being conducted, there would be no surveys in the Carolina DPS to characterize trends or status after 2019. Finding alternative surveys for this region will be important.

- Further explore uncertainty in ARIMA results (e.g., consider incorporating reverse retrospective results into survey-specific probabilities of exceeding reference points, what role lags in recruitment can play in interpretation of results or selection of reference points, whether autocorrelated models are appropriate for sturgeon YOY surveys).

- Explore the application of alternative ageing approaches such as DNA methylation-based methods (e.g., Mayne et al. 2021, Weber et al. 2024) to Atlantic sturgeon.

- Prioritize the genetic assignment of tagged fish, including the processing of archived samples, to improve the estimates of *Z* at the DPS-level.

REFERENCES

Atlantic States Marine Fisheries Commission (ASMFC). 2017. Atlantic Sturgeon Benchmark Stock Assessment and Peer Review Report. Arlington, VA.

Boucher, J.M., and K.L. Curti. 2023. Discard Estimates for Atlantic Sturgeon through 2021 (White paper). NOAA/NMFS, Woods Hole, MA: Population Dynamics Branch.

Breece, M.W., A.L. Higgs, and D.A. Fox. 2021. Spawning Intervals, Timing, and Riverine Habitat Use of Adult Atlantic Sturgeon in the Hudson River. Transactions of the American Fisheries Society 150(4): 528–37. https://doi.org/10.1002/tafs.10304.

Bunch, A.J., K.B. Carlson, F.J. Hoogakker, L.V. Plough, and H.K. Evans. 2021. Atlantic Sturgeon (*Acipenser Oxyrinchus Oxyrinchus* Mitchill, 1815) Early Life Stage Consumption Evidenced by High-throughput DNA Sequencing. Journal of Applied Ichthyology 37(1): 12–19. https://doi.org/10.1111/jai.14153.

Coleman, N., D. Fox, A. Horne, N. Hostetter, J. Madsen, M. O Brien, I. Park, C. Stence, D. Secor. 2024. Spawning run estimates and phenology for an extremely small population of Atlantic sturgeon in the Marshyhope Creek-Nanticoke River system, Chesapeake Bay. Marine and Coastal Fisheries: Dynamics, Management, and Ecosystem Science, 16, e10292. https://doi.org/10.1002/mcf2.10292

Conn, P.B. 2010. Hierarchical analysis of multiple noisy abundance indices. Canadian Journal of Fisheries and Aquatic Sciences 67(1): 108-120.

Curti, K. 2016. Updated Summary of Discard Estimates for Atlantic Sturgeon (White paper). NOAA/NMFS, Woods Hole, MA: Population Dynamics Branch.

Denison, C.D., A. Cottrell, T.M. Farmer, D.A. Fox, D.M. Hood, W.C. Post, G. Sorg, E. Waldrop, and B.K. Peoples. 2023. Seasonal Migration Cues Differ for Dual-spawning Atlantic Sturgeon in the Great Pee Dee River. Transactions of the American Fisheries Society 152(5): 694–708. https://doi.org/10.1002/tafs.10431.

Farrae, D.J., W.C. Post, and T.L. Darden. 2017. Genetic characterization of Atlantic sturgeon, *Acipenser oxyrinchus oxyrinchus*, in the Edisto River, South Carolina and identification of genetically discrete fall and spring spawning. Conserv Genet 18: 813–823. https://doi.org/10.1007/s10592-017-0929-7

Gerrodette, T. 1987. A power analysis for detecting trends. Ecology 68(5): 1364-1372.

Kahn, J.E., C. Hager, J.C. Watterson, N. Mathies, A. Deacy, and K.J. Hartman. 2023. Population and Sex-Specific Survival Estimates for Atlantic Sturgeon: Addressing Detection Probability and Tag Loss. Aquatic Biology 32: 1–12. https://doi.org/10.3354/ab00757.

Kahnle, A.W., K.A. Hattala, and K. McKown. 2007. Status of Atlantic sturgeon (*Acipenser oxyrinchus*) of the Hudson River Estuary, New York, USA. *In* Anadromous sturgeons: habitats, threats, and management. *Edited by* J. Munro, D. Hatin, J.E. Hightower, K. McKown, K.L. Sulak, A.W. Kahnle, and F. Caron. American Fisheries Society, Symposium 56, Bethesda, Md. pp. 347–364.

Kazyak, D.C., A.M. Flowers, N.J. Hostetter, J.A. Madsen, M. Breece, A. Higgs, L.M. Brown, J.A. Royle, and D.A. Fox. 2020. Integrating Side-Scan Sonar and Acoustic Telemetry to Estimate the Annual Spawning Run Size of Atlantic Sturgeon in the Hudson River. Canadian Journal of Fisheries and Aquatic Sciences 77(6): 1038–48. https://doi.org/10.1139/cjfas-2019-0398.

Kazyak, D.C., S.L. White, B.A. Lubinski, R. Johnson, and M. Eackles. 2021. Stock Composition of Atlantic Sturgeon (*Acipenser Oxyrinchus Oxyrinchus*) Encountered in Marine and Estuarine Environments on the U.S. Atlantic Coast. Conservation Genetics 22(5): 767–81. https://doi.org/10.1007/s10592-021-01361-2.

Markin, E.L., and D.H. Secor. 2020. Growth of Juvenile Atlantic Sturgeon (*Acipenser Oxyrinchus Oxyrinchus*) in Response to Dual-Season Spawning and Latitudinal Thermal Regimes. Fishery Bulletin 118(1): 74–86. https://doi.org/10.7755/FB.118.1.7.

Mayne, B., T. Espinoza, D. Roberts, G.L. Butler, S. Brooks, D. Korbie, and S. Jarman. Nonlethal age estimation of three threatened fish species using DNA methylation: Australian lungfish, Murray cod and Mary River cod. Molecular Ecology Resources 21(7):2324-32.

Melnychuk, M.C., K.J. Dunton, A. Jordaan, K.A. McKown, and M.G. Frisk. 2017. Informing Conservation Strategies for the Endangered Atlantic Sturgeon Using Acoustic Telemetry and Multi-state Mark–Recapture Models. Edited by Verena Trenkel. Journal of Applied Ecology 54(3): 914–25. https://doi.org/10.1111/1365-2664.12799.

Miller, T. J., and G.R. Shepherd. 2011. Summary of discard estimates for Atlantic sturgeon (White paper). NOAA/NMFS, Woods Hole, MA: Population Dynamics Branch.

Miller, T.J. 2015. Updated summary of discard estimates for Atlantic sturgeon (White paper). NOAA/NMFS, Woods Hole, MA: Population Dynamics Branch. Provided to the Atlantic States Marine Fisheries Commission.

Pendleton, R.M., and R. D. Adams. 2021. Long-Term Trends in Juvenile Atlantic Sturgeon Abundance May Signal Recovery in the Hudson River, New York, USA. North American Journal of Fisheries Management 41(4): 1170–81. https://doi.org/10.1002/nafm.10622.

Rothermel, E.R., M.T. Balazik, J.E. Best, M.W. Breece, D. A. Fox, B.I. Gahagan, D.E. Haulsee, et al. 2020. Comparative Migration Ecology of Striped Bass and Atlantic Sturgeon in the US Southern Mid-Atlantic Bight Flyway. Edited by Johann Mourier. PLOS ONE 15(6): e0234442. https://doi.org/10.1371/journal.pone.0234442.

Rulifson, R.A., C.W. Bangley, J.L. Cudney, A. Dell'Apa, K.J. Dunton, M.G. Frisk, M.S. Loeffler, et al. 2020. Seasonal Presence of Atlantic Sturgeon and Sharks at Cape Hatteras, a Large Continental Shelf Constriction to Coastal Migration. Marine and Coastal Fisheries 12(5): 308–21. https://doi.org/10.1002/mcf2.10111.

Savoy, T., L. Maceda, N. K. Roy, D. Peterson, and I.Wirgin. 2017. Evidence of Natural Reproduction of Atlantic Sturgeon in the Connecticut River from Unlikely Sources. Edited by Zuogang Peng. PLOS ONE 12(4): e0175085. https://doi.org/10.1371/journal.pone.0175085.

Secor, D.H., M.H.P. O'Brien, N. Coleman, A. Horne, I. Park, D.C. Kazyak, D.G. Bruce, and C. Stence. 2022. Atlantic Sturgeon Status and Movement Ecology in an Extremely Small Spawning Habitat: The Nanticoke River-Marshyhope Creek, Chesapeake Bay. Reviews in Fisheries Science & Aquaculture 30(2): 195–214. https://doi.org/10.1080/23308249.2021.1924617.

Vine, J.R., S.C. Holbrook, W.C. Post, and B.K. Peoples. 2019. Identifying Environmental Cues for Atlantic Sturgeon and Shortnose Sturgeon Spawning Migrations in the Savannah River. Transactions of the American Fisheries Society 148(3): 671–81. https://doi.org/10.1002/tafs.10163.

Vine, J.R., Y. Kanno, S.C. Holbrook, W.C. Post, and B.K. Peoples. 2019. Using Side-Scan Sonar and *N* -Mixture Modeling to Estimate Atlantic Sturgeon Spawning Migration Abundance. North American Journal of Fisheries Management 39(5): 939–50. https://doi.org/10.1002/nafm.10326.

Weber, D. N., A. T. Fields, D. W. Chamberlin, W. F. Patterson III, and D.S. Portnoy. 2024. Epigenetic age estimation in a long-lived, deepwater scorpionfish: insights into epigenetic clock development. Canadian Journal of Fisheries and Aquatic Sciences 81(5): 620-631.

White, S.L., D.A. Fox, T. Beridze, S. Bolden, R.L. Johnson, T.F. Savoy, F. Scheele, A.D. Schreier, D.C. Kazyak. 2023. Captive culture and escapes: an emerging threat to sturgeon conservation. Fisheries 48:54-61.

White, S.L., R.L. Johnson, B.A. Lubinski, M.S. Eackles, and D.C. Kazyak. 2023, Genetic population assignments of Atlantic sturgeon provided to National Marine Fisheries Service, 2022: U.S. Geological Survey Open-File Report 2023–1054, 10 p., https://doi.org/ 10.3133/ ofr20231054

White, S.L., R. Johnson, B.A. Lubinski, M.S. Eackles, D.H. Secor, and D.C. Kazyak. 2021. Stock Composition of the Historical New York Bight Atlantic Sturgeon Fishery Revealed through Microsatellite Analysis of Archived Spines. Marine and Coastal Fisheries 13(6): 720–27. https://doi.org/10.1002/mcf2.10187.

White, S.L., D.C. Kazyak, T.L. Darden, D.J. Farrae, B.A. Lubinski, R.L. Johnson, M.S. Eackles, et al. 2021. Establishment of a Microsatellite Genetic Baseline for North American Atlantic Sturgeon (*Acipenser o. Oxyrhinchus*) and Range-Wide Analysis of Population Genetics. Conservation Genetics 22(6): 977–92. https://doi.org/10.1007/s10592-021-01390-x.

White, S.L., R.M. Pendleton, A.L. Higgs, B.A. Lubinski, R.L. Johnson, and D.C. Kazyak. 2024. Integrating genetic and demographic data to refine indices of abundance for Atlantic sturgeon in the Hudson River, New York. Endangered Species Research 53:115-126.

White, S.L., N.M. Sard, H.M. Brundage, R.L. Johnson, B.A. Lubinski, M.S. Eackles, I.A. Park, D.A. Fox, and D.C. Kazyak. 2022. Evaluating Sources of Bias in Pedigree-based Estimates of Breeding Population Size. Ecological Applications 32(5): e2602. https://doi.org/10.1002/eap.2602.

Wirgin, I., A.G. Fox, L. Maceda, and J. Waldman. 2023. Two Distinct Life History Strategies of Atlantic Sturgeon in the Ogeechee River, Georgia. Diversity 15 (3): 325. https://doi.org/10.3390/d15030325.

Wirgin, I., N.K. Roy, L. Maceda, and M.T. Mattson. 2018. DPS and Population Origin of Subadult Atlantic Sturgeon in the Hudson River. *Fisheries Research* 207: 165–70. https://doi.org/10.1016/j.fishres.2018.06.004.

TABLES

Table 1. Annual sturgeon bycatch estimates for otter trawl gear based on application of the best performing model to otter trawl vessel trip records.

Year	Total Bycatch Estimate	Standard Error	Percent Dead	Dead Bycatch Estimate
2006	1,187	103	18%	212
2007	1,099	105	9%	95
2008	1,033	156	16%	167
2009	1,025	116	2%	21
2010	986	96	1%	9
2011	922	97	0%	0
2012	848	85	0%	0
2013	892	96	0%	0
2014	789	79	0%	0
2015	735	72	0%	0
2016	759	71	0%	0
2017	723	72	0%	0
2018	684	69	8%	54
2019	835	94	0%	0
2020				
2021	633	64	6%	40
2022	478	52	9%	43

Table 2. Annual sturgeon bycatch estimates for gillnet gear based on application of the best performing model to gillnet vessel trip records.

Year	Total Bycatch Estimate	Standard Error	Percent Dead	Dead Bycatch Estimate
2006	1,512	332	12%	187
2007	1,506	386	20%	301
2008	813	495	28%	227
2009	1,151	561	13%	148
2010	281	84	51%	143
2011	442	228	44%	195
2012	281	81	44%	123
2013	1,583	620	38%	594
2014	668	199	33%	223
2015	711	112	28%	197
2016	1,209	151	32%	382
2017	1,276	215	22%	276
2018	1,049	149	27%	278
2019	1,029	132	20%	206
2020				
2021	1,077	375	46%	497
2022	561	108	33%	183

Table 3. Estimated numbers of Atlantic sturgeon bycatch from the North Carolina's Atlantic sturgeon bycatch data.

Year	Total Bycatch	Percent Dead	Number Dead
2013	508	7%	34
2014	1,104	3%	37
2015	1,413	4%	57
2016	998	6%	58
2017	765	6%	44
2018	365	8%	30
2019	119	25%	30
2020	388	0%	0
2021	406	23%	94
2022	498	17%	85

Table 4. Number of Atlantic sturgeon reported as incidental bycatch by commercial American shad fisherman in South Carolina, 2000-2022. The Carolina DPS includes the Waccamaw, Pee Dee, Winyah, and Santee Rivers. The South Atlantic DPS includes the Edisto, Combahee, and Savannah Rivers.

Year	Carolina DPS			South Atlantic DPS		
	# Atlantic Sturgeon	Effort (Net Yard Hours)	CPUE (#Atlantic Sturgeon/Net Yard Hours)	# Atlantic Sturgeon	Effort (Net Yard Hours)	CPUE (#Atlantic Sturgeon/Net Yard Hours)
2000	40	2,284,770	0.0000175	5	559,575	0.0000089
2001	128	3,339,789	0.0000383	20	493,149	0.0000406
2002	74	4,222,339	0.0000175	5	301,618	0.0000166
2003	16	3,881,793	0.0000041	3	425,421	0.0000071
2004	11	4,094,782	0.0000027	0	527,201	0.0000000
2005	0	3,963,111	0.0000000	1	367,849	0.0000027
2006	226	6,607,328	0.0000342	2	389,517	0.0000051
2007	162	2,562,688	0.0000632	6	384,197	0.0000156
2008	76	4,070,683	0.0000187	0	270,265	0.0000000
2009	186	5,110,128	0.0000364	3	276,875	0.0000108
2010	12	3,357,022	0.0000036	3	221,982	0.0000135
2011	173	5,818,003	0.0000297	8	240,967	0.0000332
2012	194	5,617,356	0.0000345	11	260,664	0.0000422
2013	157	3,457,182	0.0000454	1	214,095	0.0000047
2014	15	2,876,558	0.0000052	0	163,182	0.0000000
2015	10	3,207,376	0.0000031	0	148,910	0.0000000
2016	15	1,782,507	0.0000084	0	126,589	0.0000000
2017	66	2,486,297	0.0000265	0	122,626	0.0000000
2018	138	2,436,613	0.0000566	0	108,405	0.0000000
2019	19	1,529,485	0.0000124	0	189,697	0.0000000
2020	2	1,777,785	0.0000011	0	80,115	0.0000000
2021	4	1,235,016	0.0000032	0	71,515	0.0000000
2022	4	1,149,057	0.0000035	1	63,061	0.0000016

Table 5. Fishery-independent surveys used to develop indices of relative abundance. The months and model used for the index are listed in addition to the start and end year of the survey. A length cutoff was used for determining if surveys catch predominantly young-of-the-year (YOY; <500 mm), juveniles (500-1300 mm), or adults (>1300 mm).

Survey	Months/Season	Model	Stage	Start Year	End Year
Maine-New Hampshire Trawl (ME-NH Trawl)	May, Sept, Nov	Binomial	Juveniles and Adults	2000	2022
Connecticut Long Island Sound Trawl Survey (CT LISTS)	Fall	Binomial	Juveniles	1992	2021
CT LISTS	Spring	Binomial	Juveniles	1992	2021
CT LISTS	All	Binomial	Juveniles	1992	2021
Northeast Area Monitoring and Assessment Program Trawl Survey (NEAMAP)	Fall	Binomial	Juveniles	2007	2021
New York State Department of Environmental Conservation Juvenile Atlantic Sturgeon Abundance Monitoring Program (NY JASAMP)	Spring	GAM	Juveniles	2004	2022
New Jersey Ocean Trawl Survey (NJ OT)	Jan, Apr, Jun, Oct	GLM	Juveniles	1990	2022
Virginia Institute of Marine Science Shad and River Herring Monitoring Survey (VIMS)	Spring	Binomial	Juveniles	1998	2019
VIMS James River Only	Spring	Binomial	Juveniles	1998	2019
North Carolina Program 135 (NC p135)	Spring	GLM	YOY and Juveniles	1991	2019
NC p135	Spring	GLM	YOY	1991	2019
NC p135	Spring	GLM	Juveniles	1991	2019
NC p135	Fall	GLM	YOY and Juveniles	1990	2019
NC p135	Fall	GLM	YOY	1990	2019
NC p135	Fall	GLM	Juveniles	1990	2019
South Carolina Edisto River Sturgeon Monitoring Project Survey (SC Edisto)	All Months	GLM	Juveniles	2004	2022
US Fish and Wildlife Cooperative Tagging Cruise (USFWS Coop)	Winter	GLM	Juveniles and Adults	1988	2010

Table 6. Results of the power analysis by survey for linear and exponential trends in Atlantic sturgeon abundance indices over a 20-year period. Power was calculated as the probability of detecting a 50% change. Time series length, life stage, and median coefficient of variation (CV) is reported for each index. Survey name abbreviations can be found in Table 5.

Survey	DPS	Index Timeseries	Life Stage	Median CV	Linear Trend		Exponential Trend	
					+50%	-50%	+50%	-50%
ME-NH Trawl	Gulf of Maine	2000-2022	Juvenile & Adult	1.154	0.13	0.16	0.15	0.22
CT LISTS	New York Bight	1992-1998, 2000-2009, 2011-2019, 2021	Juvenile	0.694	0.21	0.29	0.23	0.35
CT LISTS	New York Bight	1992-1998, 2000-2009, 2011-2019, 2021	Juvenile	0.722	0.20	0.27	0.22	0.33
CT LISTS	New York Bight	1992-1998, 2000-2009, 2011-2019, 2021	Juvenile	0.455	0.36	0.50	0.38	0.55
NY JASAMP	New York Bight	2004-2022	Juvenile	0.190	0.92	0.99	0.93	0.99
NJ OT	New York Bight	1990-2019, 2022	Juvenile & Adult	0.401	0.43	0.59	0.44	0.63
VIMS	Chesapeake Bay	1998-2019	Juvenile	0.518	0.30	0.48	0.32	0.48
VIMS James only	Chesapeake Bay	1998-2019	Juvenile	0.403	0.42	0.59	0.44	0.63
NEAMAP	New York Bight-Carolina	2007-2019, 2021	Juvenile	0.444	0.37	0.52	0.39	0.57
USFWS Coop	Carolina	1988-2010	Juvenile & Adult	0.506	0.31	0.44	0.33	0.49
NC p135	Carolina	1990-2019	YOY & Juveniles	0.182	0.94	0.99	0.94	0.99
NC p135	Carolina	1990-2019	YOY	0.258	0.73	0.90	0.74	0.91
NC p135	Carolina	1990-2019	Juveniles	0.289	0.65	0.83	0.66	0.85
NC p135	Carolina	1991-2019	YOY & Juveniles	0.317	0.58	0.77	0.59	0.79
NC p135	Carolina	1991-2019	YOY	0.423	0.40	0.55	0.41	0.60
NC p135	Carolina	1991-2019	Juveniles	0.407	0.42	0.58	0.44	0.62
SC Edisto	South Atlantic	2004-2022	Juvenile	0.138	1.00	1.00	1.00	1.00

Table 7. Median life history information used in the $Z_{50\%EPR}$ reference point. Table continues on the next page.

Age	Length (cm)	Proportion Mature	Bycatch Selectivity	Ship-Strike Selectivity	Weight (kg)	*M*	Fecundity
1	32.1	0.00	0.08	0.00	0.2	0.31	90995.9
2	50.8	0.00	0.23	0.00	0.8	0.21	90995.9
3	67.1	0.00	0.50	0.00	1.9	0.17	90995.9
4	81.9	0.00	0.79	1.00	3.5	0.14	90995.9
5	95.1	0.01	0.93	1.00	5.6	0.12	90995.9
6	106.8	0.01	0.98	1.00	8.0	0.11	90995.9
7	117.5	0.02	0.99	1.00	10.6	0.10	91335.2
8	127.3	0.03	1.00	1.00	13.4	0.09	92520.9
9	136.2	0.05	1.00	1.00	16.6	0.09	96470.8
10	144.4	0.08	1.00	1.00	19.7	0.08	104291.7
11	152.0	0.12	1.00	1.00	23.1	0.08	115423.8
12	158.9	0.19	1.00	1.00	26.4	0.08	135527.6
13	165.2	0.27	1.00	1.00	29.8	0.07	183316.7
14	171.1	0.38	1.00	1.00	33.3	0.07	339359.8
15	176.7	0.50	1.00	1.00	36.5	0.07	490655.7
16	181.9	0.63	1.00	1.00	39.9	0.07	629404.6
17	186.7	0.74	1.00	1.00	43.2	0.07	770975.8
18	191.3	0.82	1.00	1.00	46.4	0.06	903715.8
19	195.4	0.89	1.00	1.00	49.6	0.06	1024231.2
20	199.4	0.93	1.00	1.00	52.7	0.06	1139715.1
21	202.9	0.96	0.99	1.00	55.7	0.06	1241324.0
22	206.4	0.97	0.97	1.00	58.8	0.06	1344861.1
23	209.6	0.98	0.91	1.00	61.6	0.06	1439418.1
24	212.8	0.99	0.77	1.00	64.4	0.06	1530709.6
25	215.6	0.99	0.50	1.00	67.2	0.06	1612340.4
26	218.3	1.00	0.21	1.00	70.0	0.06	1693249.2
27	220.9	1.00	0.06	1.00	72.4	0.06	1769304.0
28	223.3	1.00	0.02	1.00	74.9	0.06	1837289.8
29	225.5	1.00	0.01	1.00	77.1	0.05	1903293.5
30	227.7	1.00	0.00	1.00	79.2	0.05	1964925.8
31	229.4	1.00	0.00	1.00	81.4	0.05	2015602.3
32	231.4	1.00	0.00	1.00	83.5	0.05	2075587.8
33	233.2	1.00	0.00	1.00	85.2	0.05	2126190.9
34	234.8	1.00	0.00	1.00	87.2	0.05	2174873.7
35	236.5	1.00	0.00	1.00	88.7	0.05	2223011.3
36	238.0	1.00	0.00	1.00	90.4	0.05	2266675.2
37	239.4	1.00	0.00	1.00	91.9	0.05	2309000.0
38	240.7	1.00	0.00	1.00	93.4	0.05	2346197.8

Age	Length (cm)	Proportion Mature	Bycatch Selectivity	Ship-Strike Selectivity	Weight (kg)	*M*	Fecundity
39	241.9	1.00	0.00	1.00	94.9	0.05	2380814.5
40	243.0	1.00	0.00	1.00	96.3	0.05	2411883.3
41	244.3	1.00	0.00	1.00	97.6	0.05	2449495.1
42	245.5	1.00	0.00	1.00	99.0	0.05	2484347.2
43	246.4	1.00	0.00	1.00	100.1	0.05	2512884.9
44	247.3	1.00	0.00	1.00	101.1	0.05	2539675.2
45	248.3	1.00	0.00	1.00	102.5	0.05	2567953.4
46	249.0	1.00	0.00	1.00	103.3	0.05	2588918.2
47	249.7	1.00	0.00	1.00	104.5	0.05	2609761.0
48	250.6	1.00	0.00	1.00	105.6	0.05	2635485.3
49	251.4	1.00	0.00	1.00	106.5	0.05	2658257.6
50	252.2	1.00	0.00	1.00	107.5	0.05	2682246.7
51	252.8	1.00	0.00	1.00	108.3	0.05	2699340.3
52	253.4	1.00	0.00	1.00	109.1	0.05	2716885.6
53	254.0	1.00	0.00	1.00	110.1	0.05	2733578.0
54	254.7	1.00	0.00	1.00	111.0	0.05	2755329.4
55	254.3	1.00	0.00	1.00	110.9	0.05	2742443.5
56	254.9	1.00	0.00	1.00	111.5	0.05	2761337.8
57	255.4	1.00	0.00	1.00	112.3	0.05	2775846.9
58	255.9	1.00	0.00	1.00	112.8	0.05	2788317.5
59	256.5	1.00	0.00	1.00	113.7	0.05	2805446.1
60	256.9	1.00	0.00	1.00	114.3	0.05	2818772.7

Table 8. Number of acoustically tagged Atlantic sturgeon by DPS and size group.

	Total	< 1300 mm	> 1300 mm
Gulf of Maine	224	55	169
NY Bight	534	144	390
Chesapeake Bay	464	74	390
Carolina	489	208	281
South Atlantic	364	133	231

Table 9. Estimates of annual survival, total mortality, and the probability of *Z* being above the *Z* threshold for the coastwide population and for each individual DPS.

Population	Median Annual Survival Rate, *S* (2.5^{th}-97.5^{th} percentiles)	Median Annual Total Mortality, *Z* (2.5^{th}-97.5^{th} percentiles)	$Z_{50\%\ EPR}$ reference point	Probability that *Z* is greater than the $Z_{50\%EPR}$ reference point
Coast	0.99 (0.89-1.00)	0.01 (0.001-0.11)	0.14	1.8%
Gulf of Maine	0.86 (0.34-0.98)	0.15 (0.018-1.08)		55.5%
NY Bight	0.94 (0.63-1.00)	0.06 (0.005-0.46))		20.2%
Chesapeake Bay	0.95 (0.67-1.00)	0.05 (0.003-0.41)		14.1%
Carolina	0.95 (0.63-1.00)	0.05 (0.003-0.46)		18.2%
South Atlantic	0.93 (0.60-1.00)	0.07 (0.004-0.51)		26.5%

Table 10. Probability that *Z* is greater than the $Z_{50\%EPR}$ reference point from the 2024 update and the 2017 benchmark.

Population	2024 Update	2017 Benchmark
Coast	1.8%	6.5%
Gulf of Maine	55.5%	73.5%
NY Bight	20.2%	31.2%
Chesapeake Bay	14.1%	30.0%
Carolina	18.2%	75.4%
South Atlantic	26.5%	40.2%

Table 11. Summary statistics for ARIMA model results. n = number of years in time series, W = Shapiro-Wilk statistic for normality, adj p = Holm-adjusted probability of rejecting the null hypothesis regarding normality of model residuals, r1, r2, and r3 = the first three sample autocorrelations for the first differenced logged series, (θ) = moving average parameter, SE = standard error of theta, σ^2_c = variance of index. JYR = James, York, Rappahannock.

DPS	Survey	Years avail	n	W	adj p	r_1	r_2	r_3	θ	SE	σ^2_c
GOM	ME-NH Trawl	2000-2022	23	0.96	0.37	-0.54	-0.1	0.41	1.00	0.13	0.22
NYB	CT LISTS Fall	1992-2021	30	0.98	1.00	-0.65	0.46	-0.29	0.55	0.22	0.31
NYB	CT LISTS Spring	1992-2021	30	0.96	1.00	-0.23	-0.44	0.1	0.92	0.12	0.39
NYB	CT LISTS All Months	1992-2021	30	0.98	1.00	-0.43	-0.1	-0.09	1.00	0.12	0.19
NYB	NY JASAMP	2004-2022	19	0.97	1.00	-0.3	-0.08	-0.06	0.47	0.29	0.49
NYB	NJ Ocean Trawl	1990-2022	33	0.98	1.00	-0.35	0.08	-0.12	0.40	0.17	0.36
CB	VIMS-JYR	1998-2019	22	0.91	0.12	0.19	-0.32	-0.33	0.39	0.29	0.71
CB	VIMS-J Spring	1998-2019	22	0.93	0.12	-0.17	-0.23	-0.03	1.00	0.14	1.3
C	NC p135 Spring YOY + Juv	1991-2019	29	0.98	1.00	-0.18	-0.28	-0.12	0.63	0.25	0.37
C	NC p135 Spring YOY	1991-2019	29	0.97	1.00	-0.36	-0.17	0.12	1.00	0.31	0.25
C	NC p135 Spring Juv	1991-2019	29	0.93	0.31	-0.18	-0.33	-0.29	0.66	0.13	0.13
C	NC p135 Fall YOY+Juv	1990-2019	30	0.97	1.00	-0.26	-0.28	0.12	0.74	0.15	0.56
C	NC p135 Fall YOY	1990-2019	30	0.96	1.00	-0.37	-0.28	0.22	0.92	0.13	0.93
C	NC p135 Fall Juv	1990-2019	30	0.96	1.00	-0.26	-0.31	0.2	0.55	0.17	0.1
C	USFWS	1988-2010	23	0.94	1.00	-0.54	0.31	-0.37	1.00	1.6	0.5
SA	SC Edisto	2004-2022	19	0.88	0.02	-0.52	0.1	0.27	0.77	0.33	0.33
NYB-CB-C	NEAMAP Fall	2007-2021	15	0.96	0.71	-0.43	-0.16	0.26	0.59	0.29	0.21
Coast	Conn	1990-2022	33	0.95	0.11	-0.44	0.04	0.12	0.53	0.15	0.06

Table 12. ARIMA and trend analysis results for Atlantic sturgeon indices of abundance. Shown are the probabilities that the terminal year (ty) of an index is greater than the 25th percentile of a time series and the probabilities that the terminal year of an index is greater than the index value in 1998 (or surrogate reference year if survey started after 1998); green shading indicates ≥ 50% probability. The Mann Kendall tau (τ) statistic, Holm-adjusted probability of the Mann-Kendall time series trend being significant, and whether the trend is increasing (+), decreasing (-), or not significant (n.s.). Light grey font indicates a strong (0.60) within survey correlation. JYR = James, York, Rappahannock. Underlined probabilities are those values represented in the DPS tallies and averages presented Table 13.

										Trend analysis results **ARIMA fits**			Trend analysis results **Raw index**		
DPS	Survey	Months	Ages	P(ty > 25th pctl)	P(ty > yrAsRefPt)	n	First yr	Terminal yr	yrAsRefPt	M-K τ	M-K p_{adj}	Trend	M-K τ	M-K p_{adj}	Trend
GOM	ME-NH Trawl	5, 10, 11	Juveniles and Adults	0.59	0.45	23	2000	2022	2000	-0.45	0.00	-	-0.08	0.63	n.s.
NYB	CT LISTS Fall	Fall	Juveniles	0.96	0.97	30	1992	2021	1998	0.09	0.53	n.s.	0.07	0.65	n.s.
NYB	CT LISTS Spring	Spring	Juveniles	0.51	0.29	30	1992	2021	1998	-0.74	0.00	-	-0.22	0.44	n.s.
NYB	CT LISTS All Months	All	Juveniles	0.43	0.12	30	1992	2021	1998	-0.62	0.00	-	-0.14	0.57	n.s.
NYB	NY JASAMP	Spring	Juveniles	0.65	0.57	19	2004	2022	2004	0.36	0.08	n.s.	0.24	0.49	n.s.
NYB	NJ Ocean Trawl	1, 4, 6, 10	Juveniles	1.00	1.00	33	1990	2022	1998	0.52	0.00	+	0.38	0.02	+
CB	VIMS-JYR	Spring	Juveniles	0.97	0.38	22	1998	2019	1998	-0.13	0.40	n.s.	-0.02	1.00	n.s.
CB	VIMS-J Spring	Spring	Juveniles	0.45	0.15	22	1998	2019	1998	-0.45	0.00	-	0.07	1.00	n.s.
C	NC p135 Spring YOY + Juv	Spring	YOY+Juveniles	1.00	0.99	29	1991	2019	1998	0.79	0.00	+	0.44	0.00	+
C	NC p135 Spring YOY	Spring	YOY	0.82	0.82	29	1991	2019	1998	0.52	0.00	+	0.18	0.51	n.s.
C	NC p135 Spring Juv	Spring	Juveniles	1.00	1.00	29	1991	2019	1998	0.93	0.00	+	0.60	0.00	+
C	NC p135 Fall YOY+Juv	Fall	YOY+Juveniles	0.99	0.99	30	1990	2019	1998	0.76	0.00	+	0.37	0.02	+
C	NC p135 Fall YOY	Fall	YOY	0.66	0.63	30	1990	2019	1998	0.67	0.00	+	0.17	0.51	n.s.
C	NC p135 Fall Juv	Fall	Juveniles	1.00	1.00	30	1990	2019	1998	0.90	0.00	+	0.55	0.00	+
C	USFWS	Winter	Juveniles and Adults	0.53	0.42	23	1988	2010	1998	0.09	0.56	n.s.	0.17	0.51	n.s.
SA	SC Edisto	5-9	Juveniles	0.76	0.31	19	2004	2022	2004	0.38	0.03	+	0.19	0.26	n.s.
NYB-CB-C	NEAMAP Fall	Fall	Juveniles	0.93	0.84	15	2007	2021	2007	0.32	0.13	n.s.	0.27	0.19	n.s.
Coast	Conn	All Months	YOY, Juv, Adult	1.00	1.00	33	1990	2022	1998	0.67	0.00	+	0.55	0.00	+

Table 13. Summary of tally and percentage of surveys, by DPS, where terminal year index (ty) is greater than the reference value, either the 25th percentile of a given time series or the index value in 1998 (or start year of survey, whichever is later) for a given index (a). See columns 1 and 2 of Table 12 for list of surveys included in each DPS. Results from ASMFC (2017) are provided for comparative purposes. Plot of (a) mean, by DPS and assessment year. * = 1998 or first year of survey, whichever is more recent (b).

(a)

ASMFC (2024)

Tally

DPS	P (ty > 25th pctl)	P (ty > 1998*)
GOM	1 of 1	0 of 1
NYB	4 of 5	3 of 5
CB	1 of 2	0 of 2
C	5 of 5	4 of 5
SA	1 of 1	0 of 1
NYB-CB-C	1 of 1	1 of 1
Coast	1 of 1	1 of 1

Pct

DPS	P (ty > 25th pctl)	P (ty > 1998*)
GOM	100%	0%
NYB	80%	60%
CB	50%	0%
C	100%	80%
SA	100%	0%
NYB-CB-C	100%	100%
Coast	100%	100%

Mean

DPS	P (ty > 25th pctl)	P (ty > 1998*)
GOM	0.59	0.45
NYB	0.71	0.59
CB	0.71	0.27
C	0.80	0.77
SA	0.76	0.31
NYB-CB-C	0.93	0.84
Coast	1.00	1.00

ASMFC (2017)

Tally

DPS	P (ty > 25th pctl)	P (ty > 1998*)
GOM	1 of 1	1 of 1
NYB	4 of 4	3 of 4
CB	1 of 1	0 of 1
C	5 of 5	3 of 5
SA	1 of 1	0 of 1
NYB-CB-C	0 of 1	0 of 1
Coast	1 of 1	1 of 1

Pct

DPS	P (ty > 25th pctl)	P (ty > 1998*)
GOM	100%	100%
NYB	100%	75%
CB	100%	0%
C	100%	60%
SA	100%	0%
NYB-CB-C	0%	0%
Coast	100%	100%

Mean

DPS	P (ty > 25th pctl)	P (ty > 1998*)
GOM	0.61	0.51
NYB	0.80	0.75
CB	0.96	0.36
C	0.72	0.67
SA	0.51	0.28
NYB-CB-C	0.49	0.33
Coast	0.95	0.95

(b)

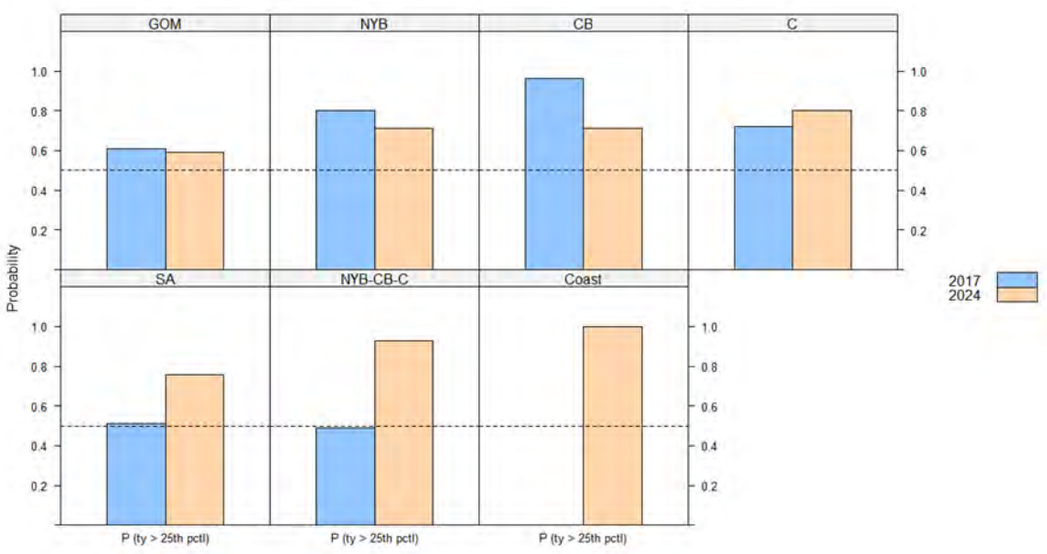


Table 14. Stock status determination for the coastwide stock and individual DPSs based on morality estimates and biomass/abundance status relative to historic levels and the terminal year of indices relative to the start of the moratorium as determined by the ARIMA analysis.

Population	Mortality Status	Biomass/Abundance Status		
	$P(Z)>Z_{50\%EPR}$ Reference Point	Relative to Historical Levels	NOAA Designation	Average probability of terminal year of indices > reference year*
Coastwide	1.80%	Depleted		100%
Gulf of Maine	55.50%	Depleted	Threatened	45%
New York Bight	20.20%	Depleted	Endangered	59%
Chesapeake Bay	14.10%	Depleted	Endangered	27%
Carolina	18.20%	Depleted	Endangered	77%
South Atlantic	26.50%	Depleted	Endangered	31%

***Reference year is 1998, or the first year of the survey for indices that started after 1998**

FIGURES

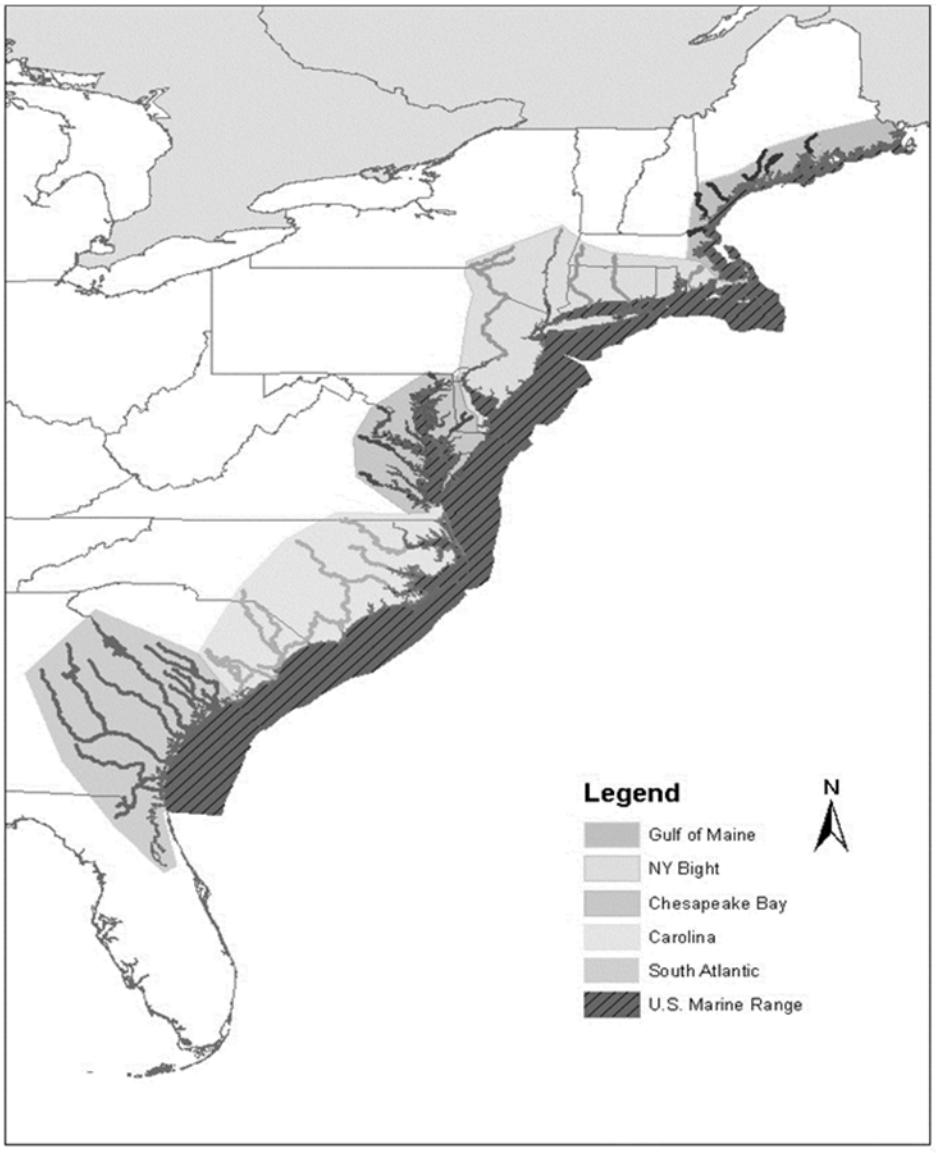


Figure 1. The five distinct population segments (DPS) for the Atlantic sturgeon. Source: NOAA Fisheries Final Rule, 77 FR 5880.

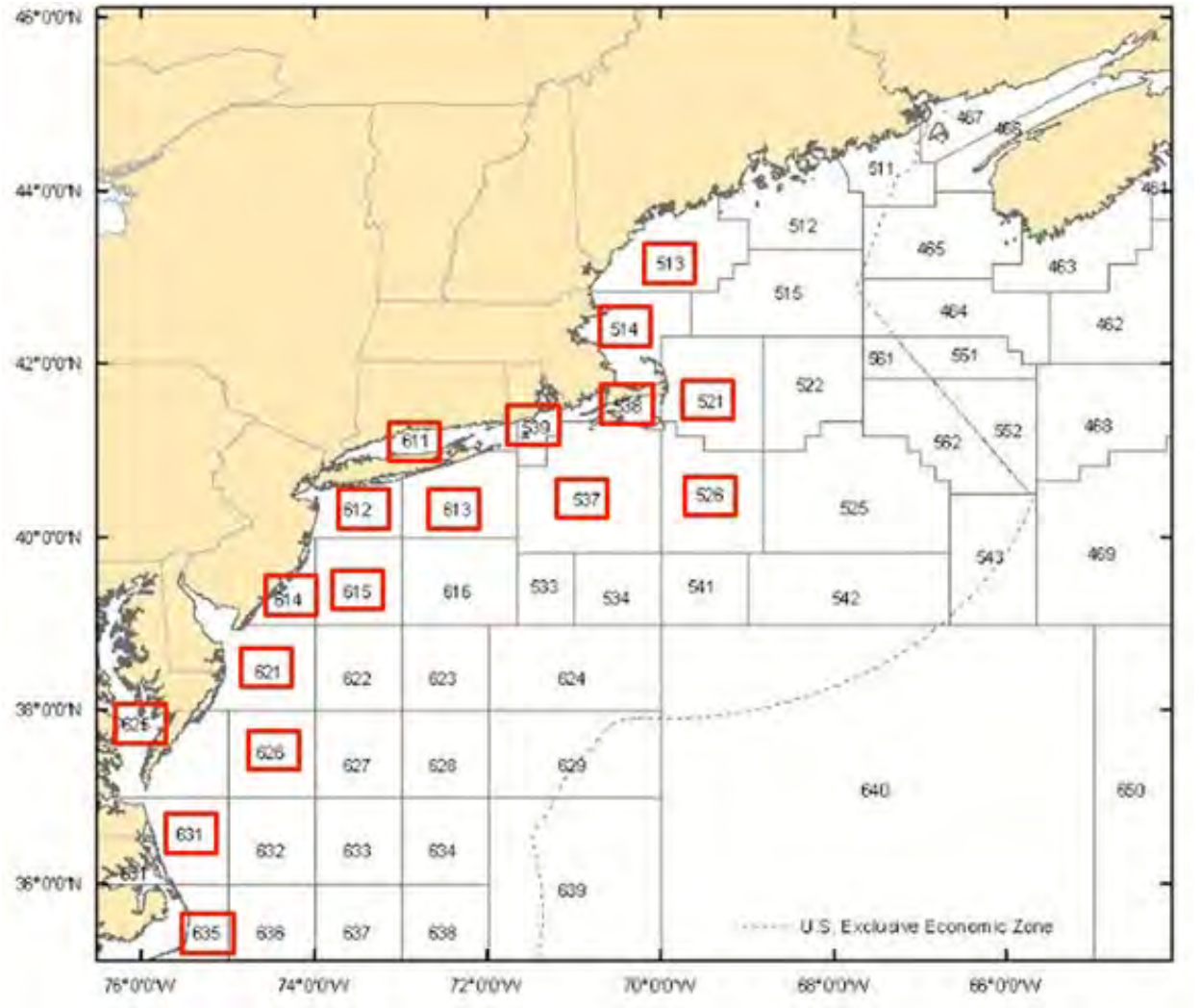


Figure 2. Observed trips used in the estimation of bycatch included coastal statistical areas 513, 514, 521, 526, 537, 538, 539, 611, 612, 613, 614, 615, 621, 625, 626, 631, and 635.

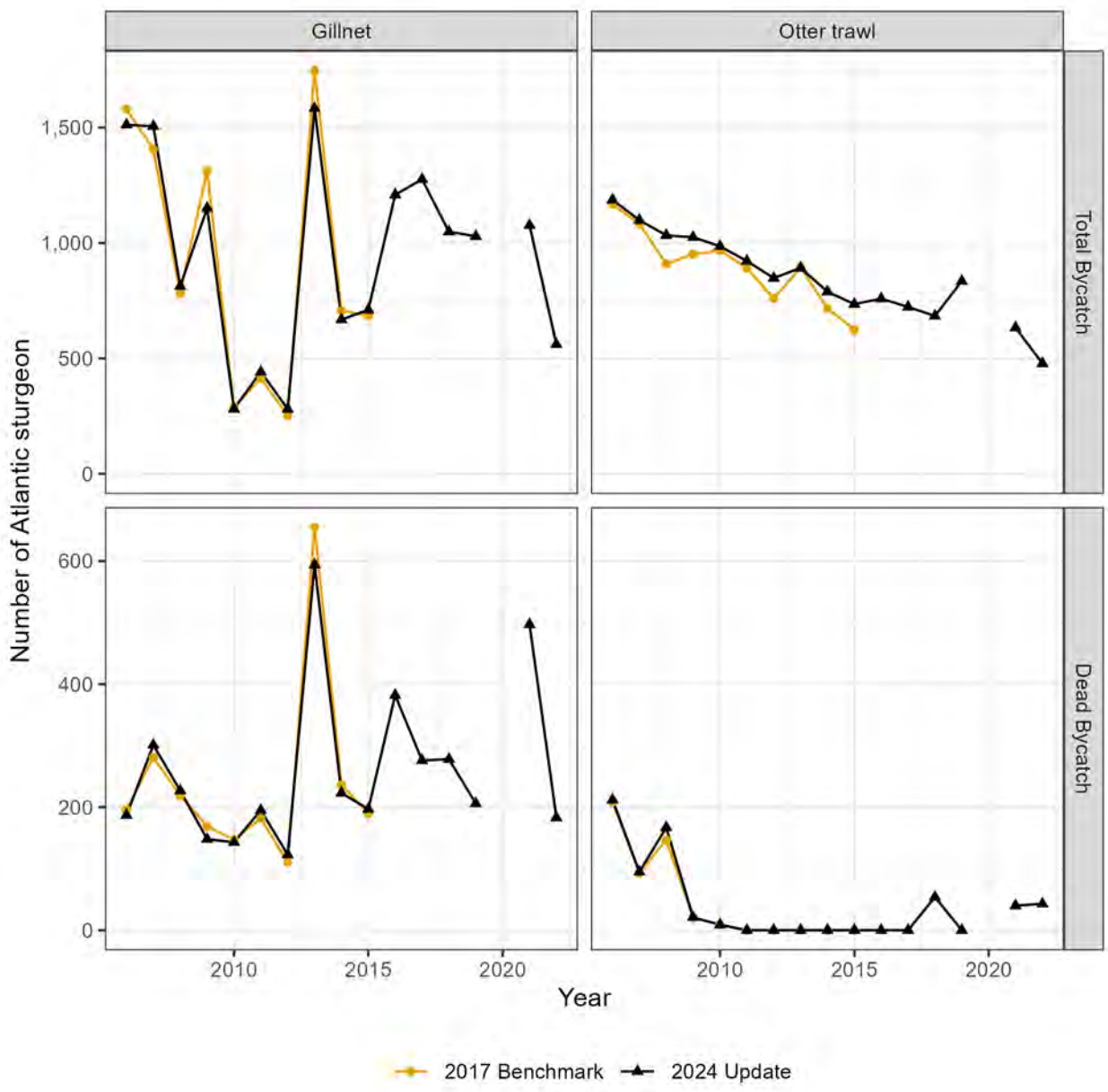


Figure 3. Estimates of total Atlantic sturgeon bycatch and dead bycatch by gear from the 2024 update compared to the 2017 benchmark assessment.

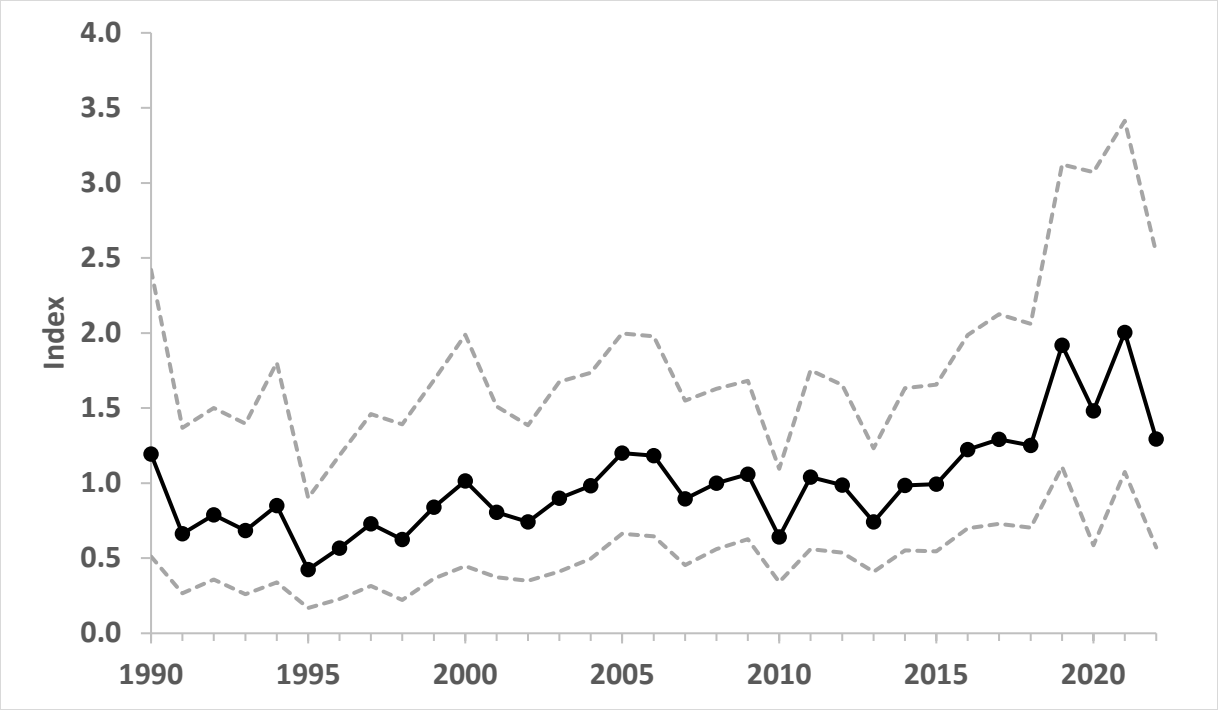


Figure 4. Time series of coastwide juvenile and adult Atlantic sturgeon relative abundance using Conn (2010) with 95% credible intervals.

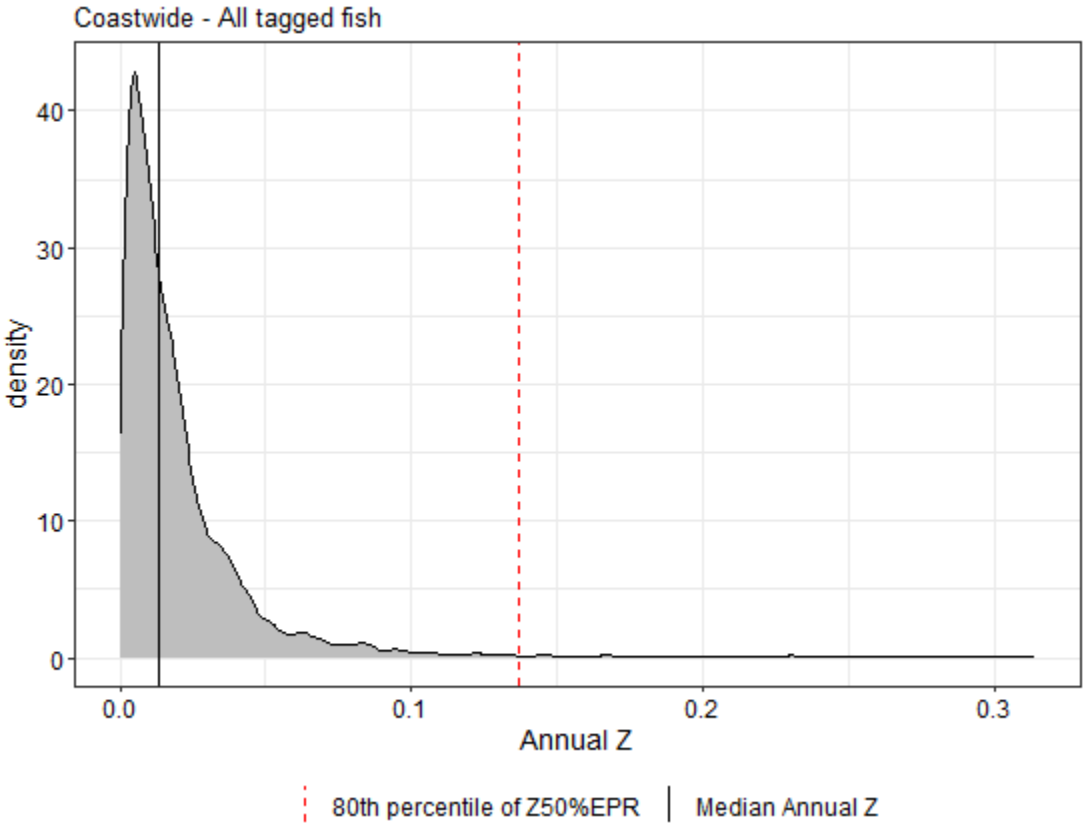


Figure 5. Distribution of annual *Z* estimate from the tagging model for the coastwide population (all tagged fish), plotted with the median annual *Z* and the *Z* reference point. The x-axis has been truncated to exclude the highest 0.5% of *Z* estimates to show detail.

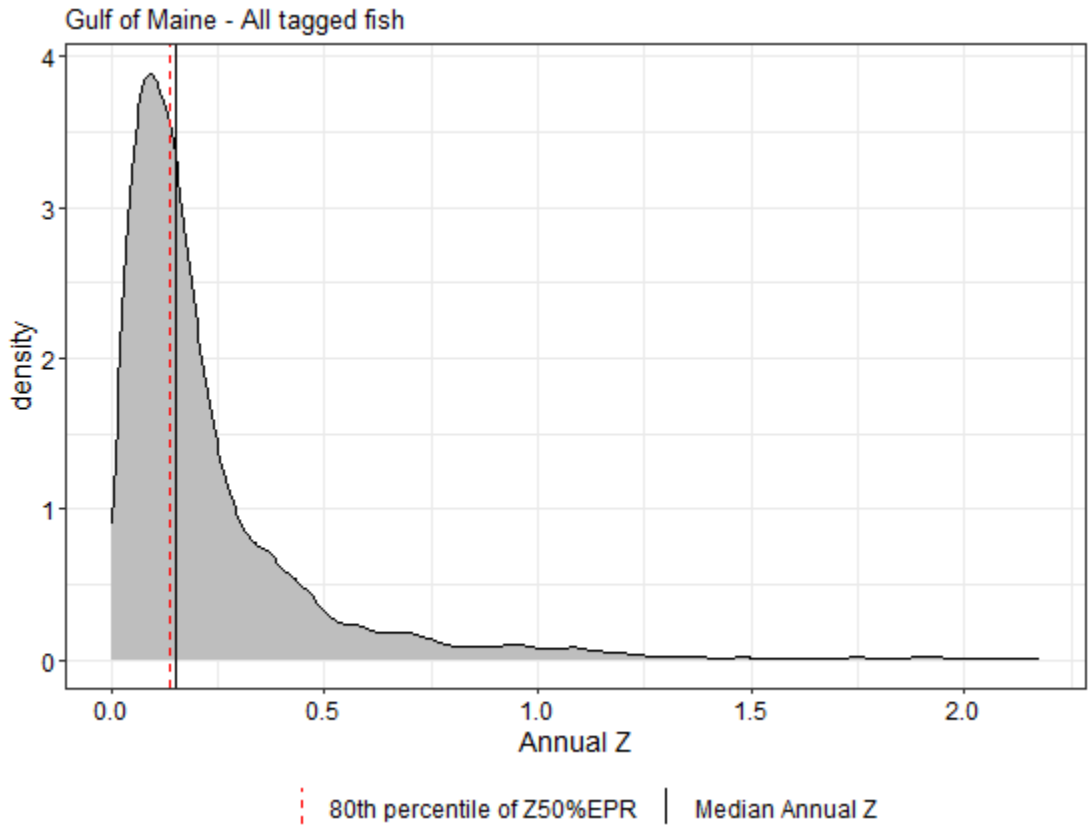


Figure 6. Distribution of annual *Z* estimate from the tagging model for all tagged fish assigned to the Gulf of Maine DPS, plotted with the median annual *Z* and the *Z* reference point. The x-axis has been truncated to exclude the highest 0.5% of *Z* estimates to show detail.

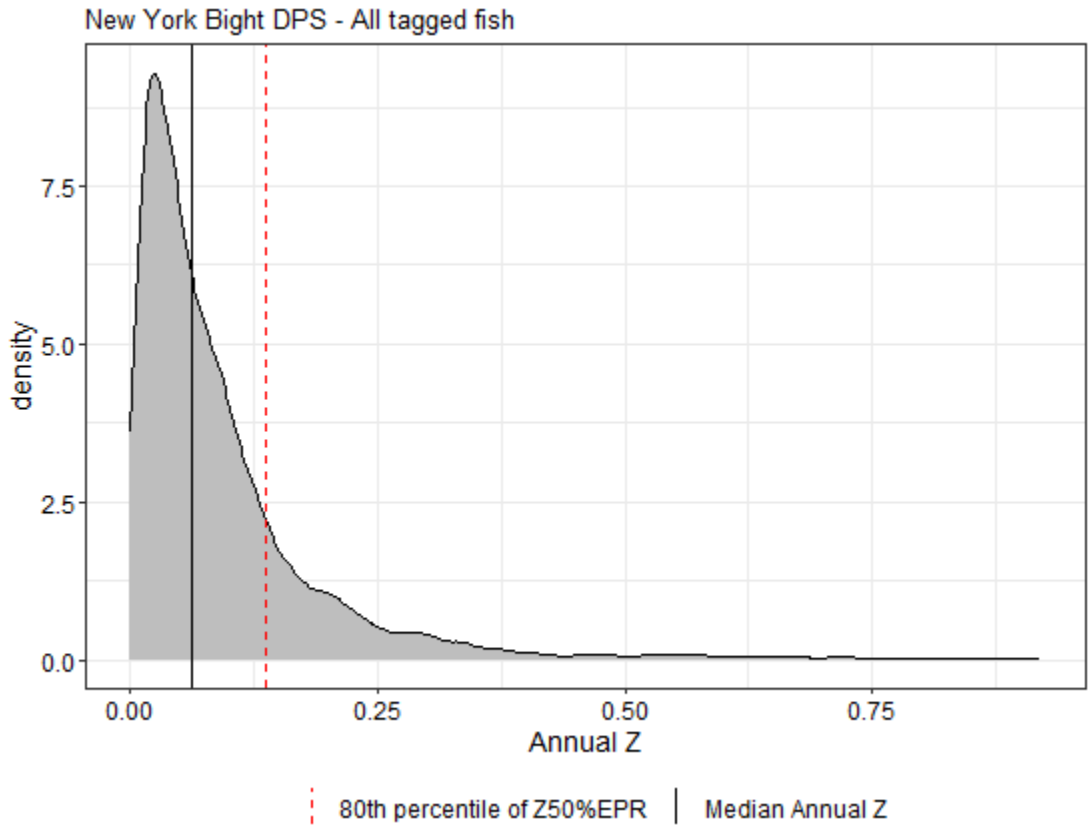


Figure 7. Distribution of annual *Z* estimate from the tagging model for all tagged fish assigned to the New York Bight DPS, plotted with the median annual *Z* and the *Z* reference point. The x-axis has been truncated to exclude the highest 0.5% of *Z* estimates to show detail.

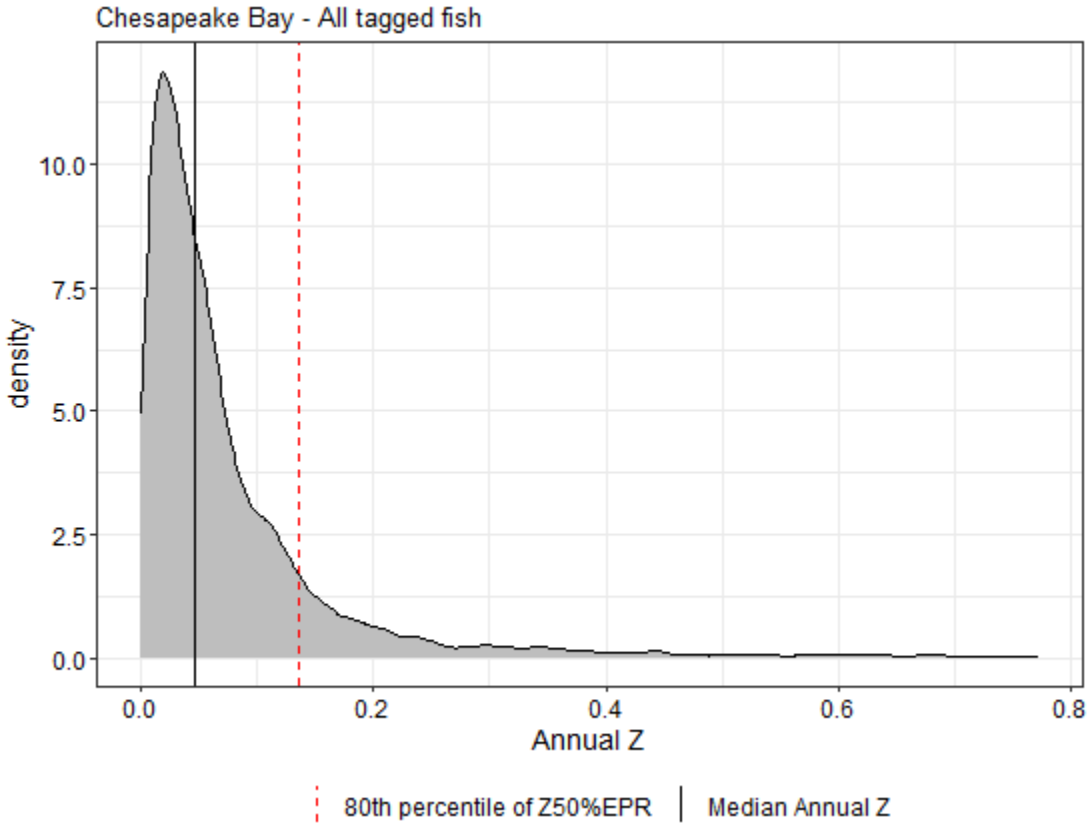


Figure 8. Distribution of annual *Z* estimate from the tagging model for all tagged fish assigned to the Chesapeake Bay DPS, plotted with the median annual *Z* and the *Z* reference point. The x-axis has been truncated to exclude the highest 0.5% of *Z* estimates to show detail.

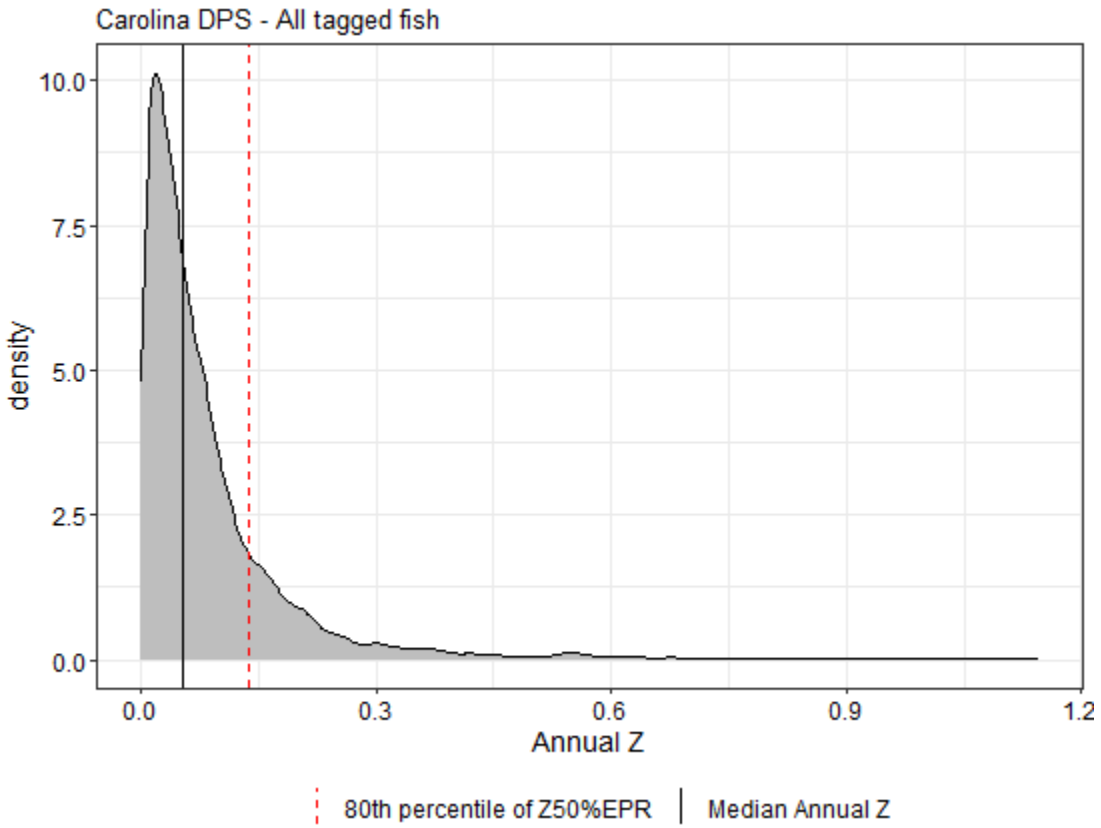


Figure 9. Distribution of annual *Z* estimate from the tagging model for all tagged fish assigned to the Carolina DPS, plotted with the median annual *Z* and the *Z* reference point. The x-axis has been truncated to exclude the highest 0.5% of *Z* estimates to show detail.

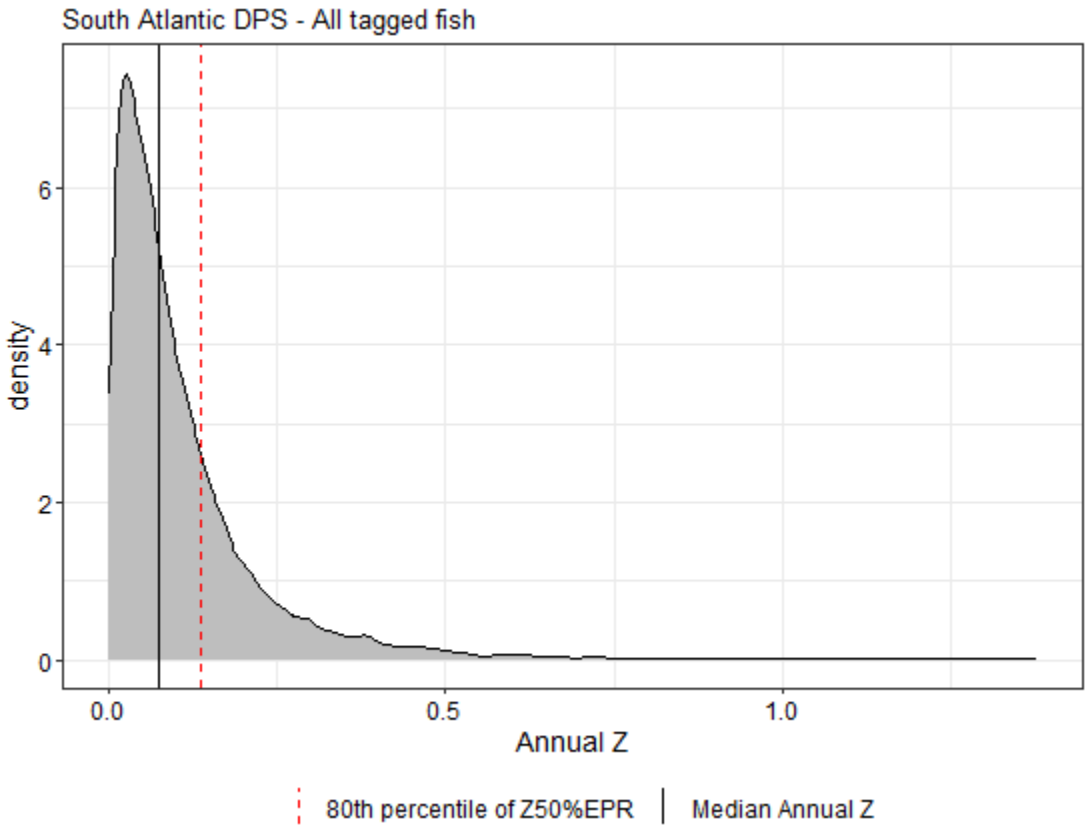


Figure 10. Distribution of annual *Z* estimate from the tagging model for all tagged fish assigned to the South Atlantic DPS, plotted with the median annual *Z* and the *Z* reference point. The x-axis has been truncated to exclude the highest 0.5% of *Z* estimates to show detail.

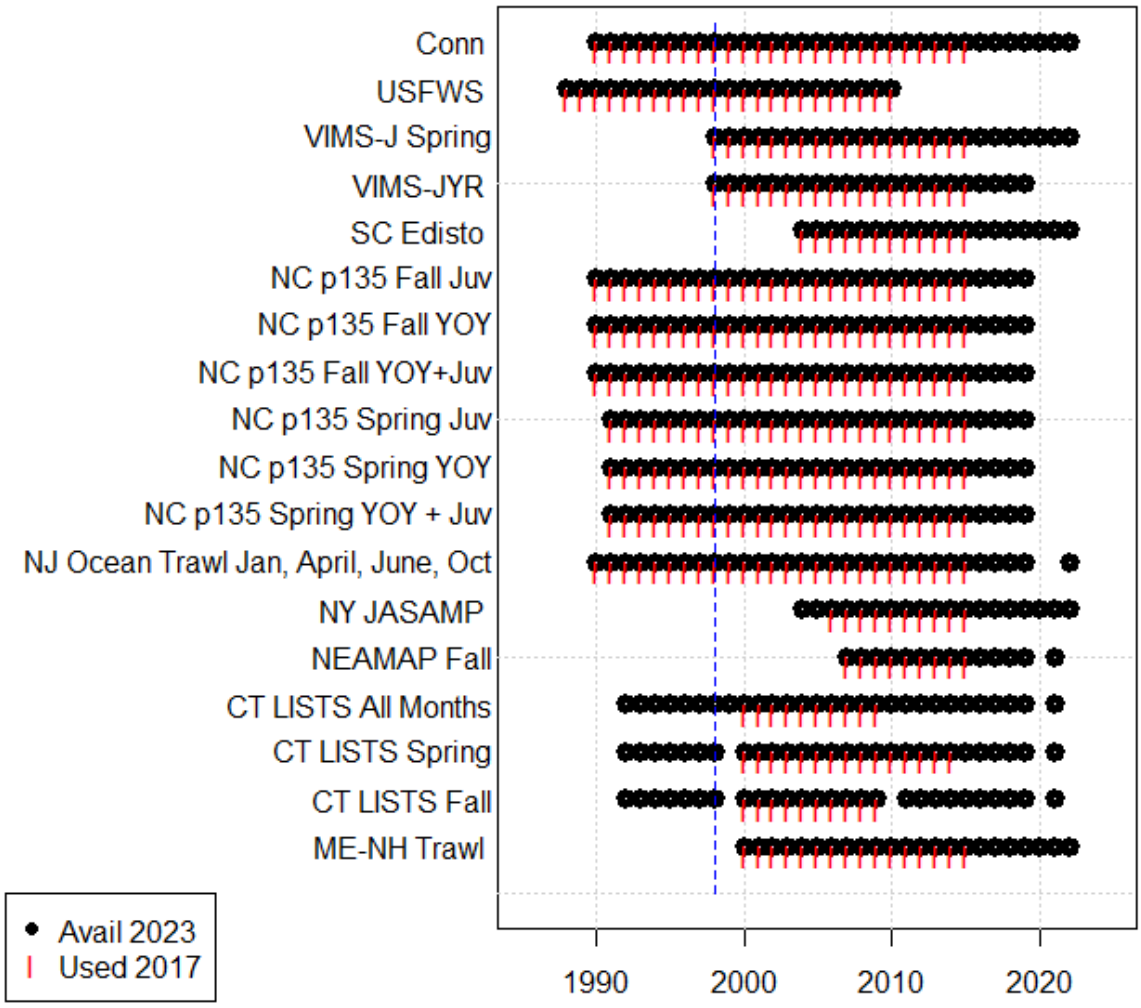


Figure 11. Visualization of the years of data available for 2023/2024 ARIMAs and those used for 2017 ARIMAs (ASMFC 2017). A blue vertical dashed line is added at 1998. Index values for the VIMS survey was not used in the final ARIMAs due to changes in the gear, net location, and effort.

Figure 12. Plot of raw indices used in 2017 and 2023 ARIMAs.

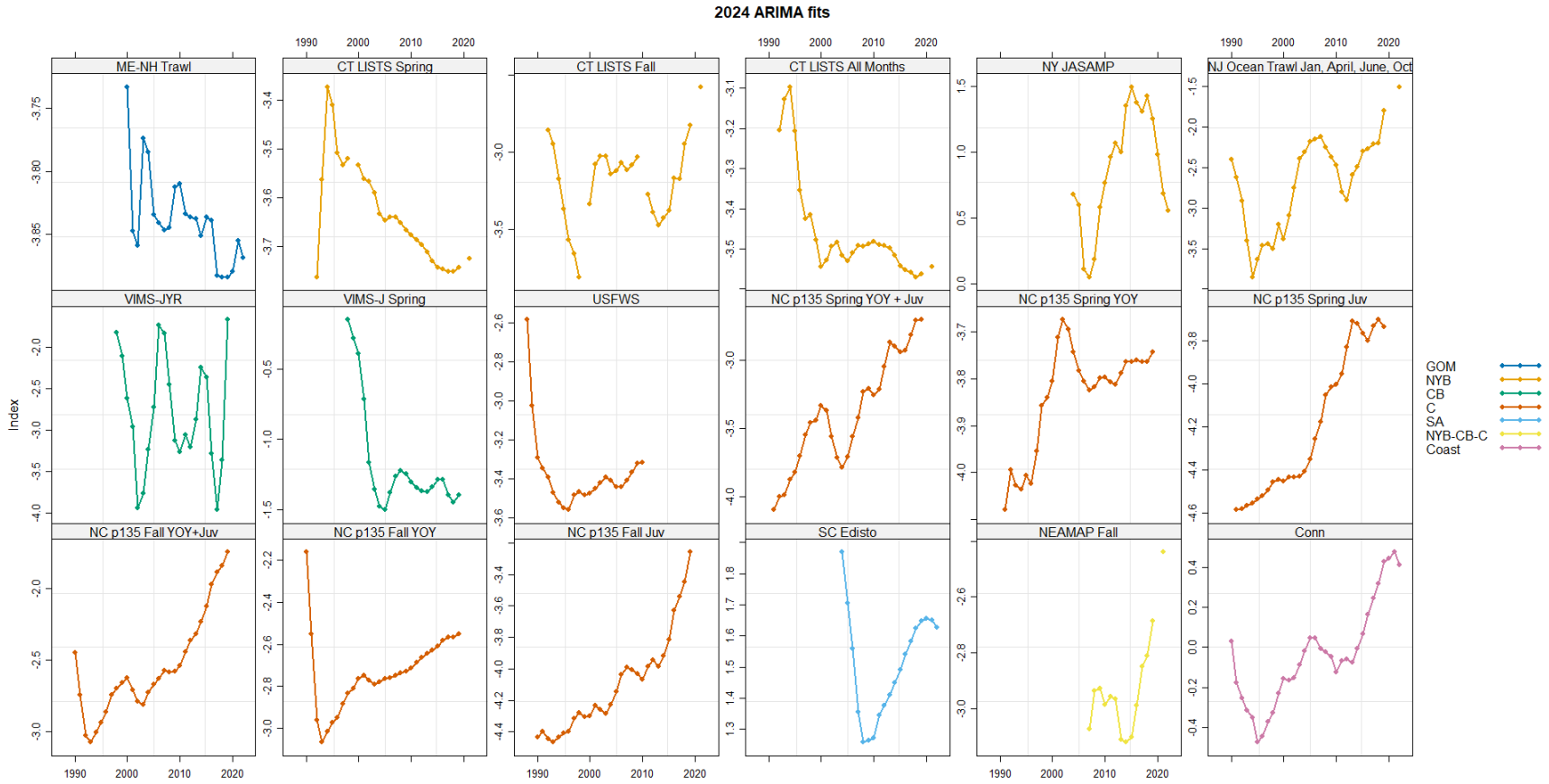


Figure 13. ARIMA fitted indices plotted on individualized y-axes. See Table 12 for results of trend analysis.

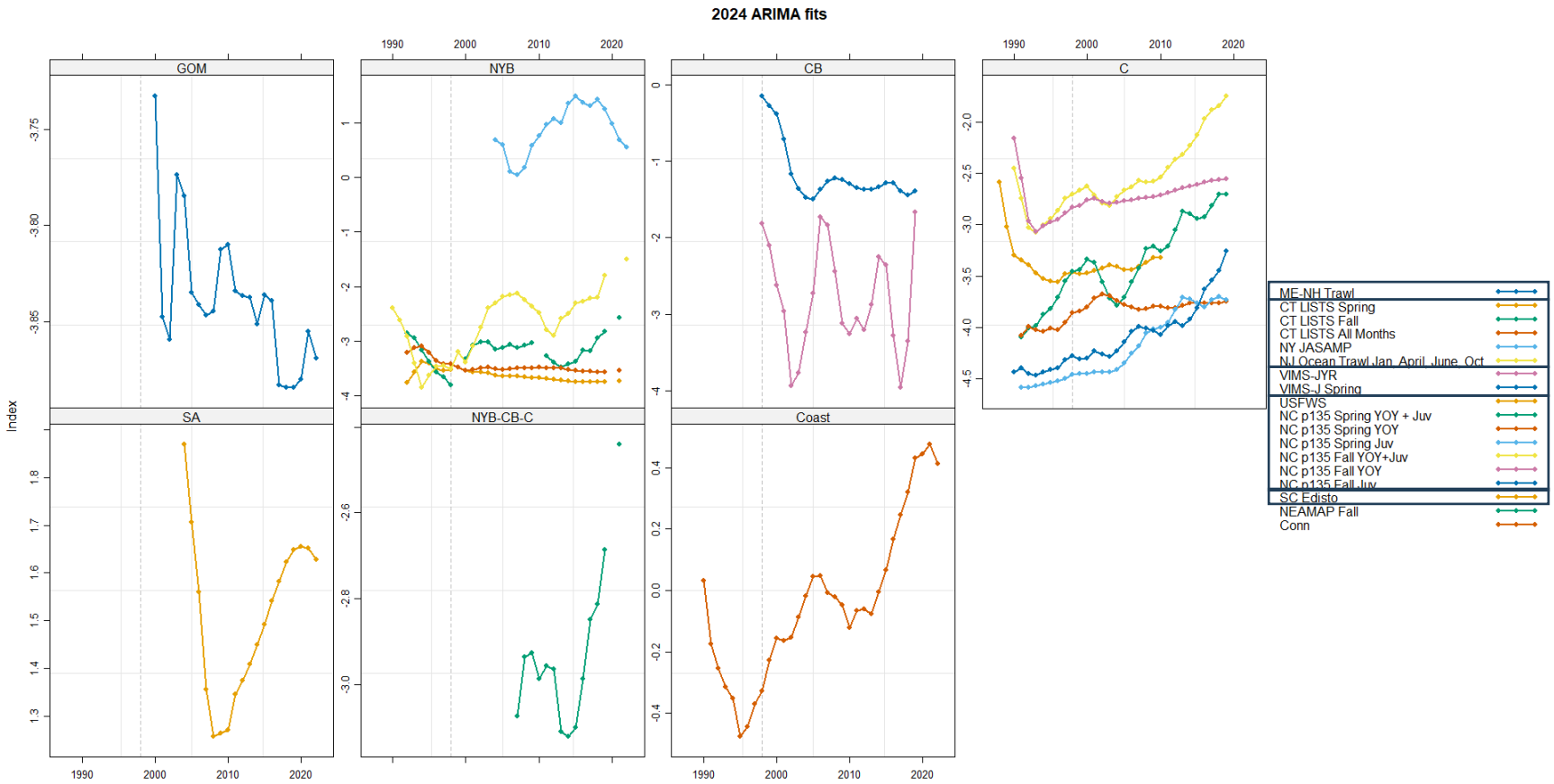


Figure 14. ARIMA fitted indices grouped by DPS plotted on separate y-axes. Boxes are drawn around surveys within DPSs. See Table 12 for results of trend analysis.

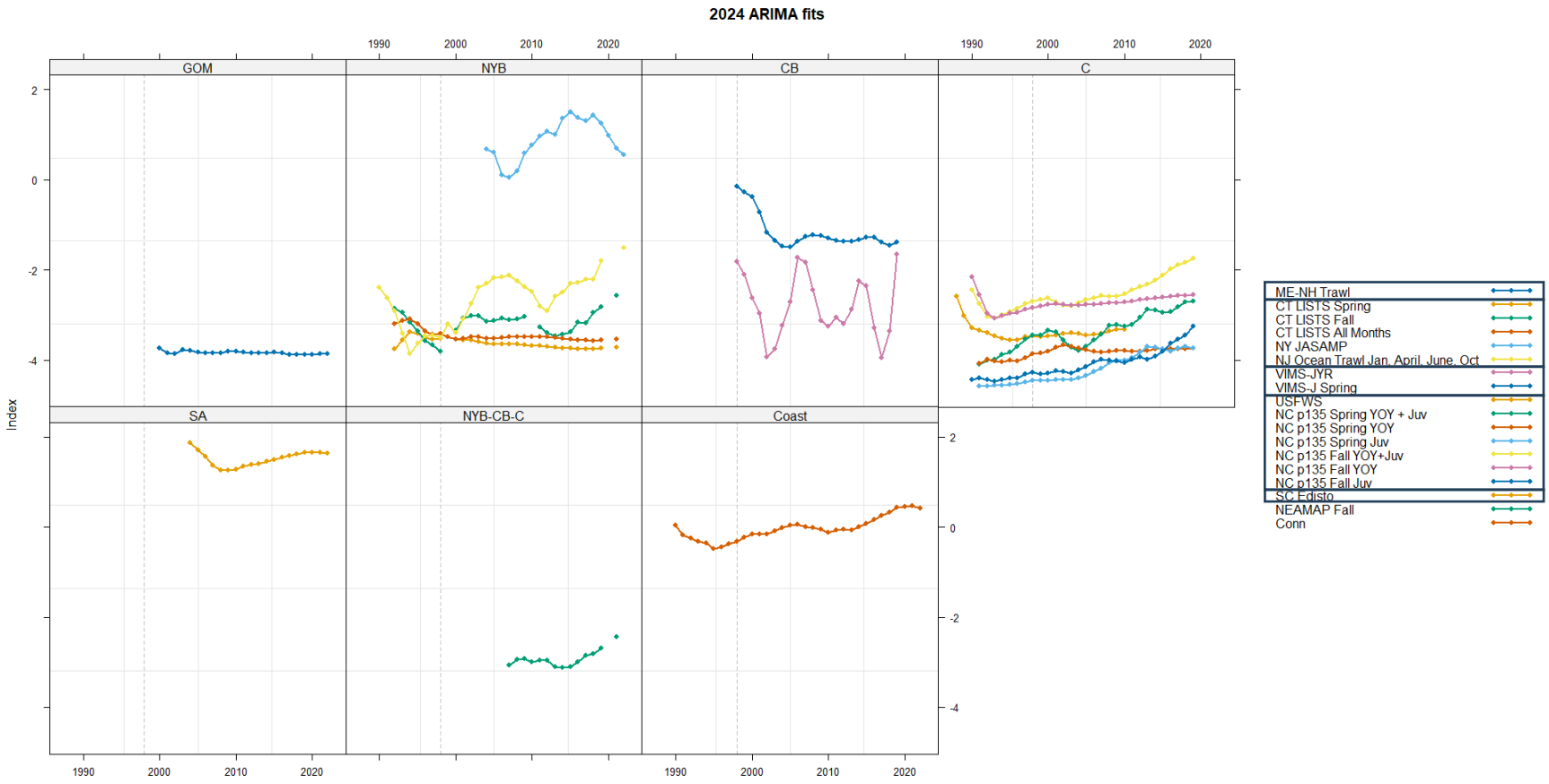


Figure 15. ARIMA fitted indices grouped by DPS plotted on a common y-axis. Boxes are drawn around surveys within DPSs. See Table 12 for results of trend analysis.

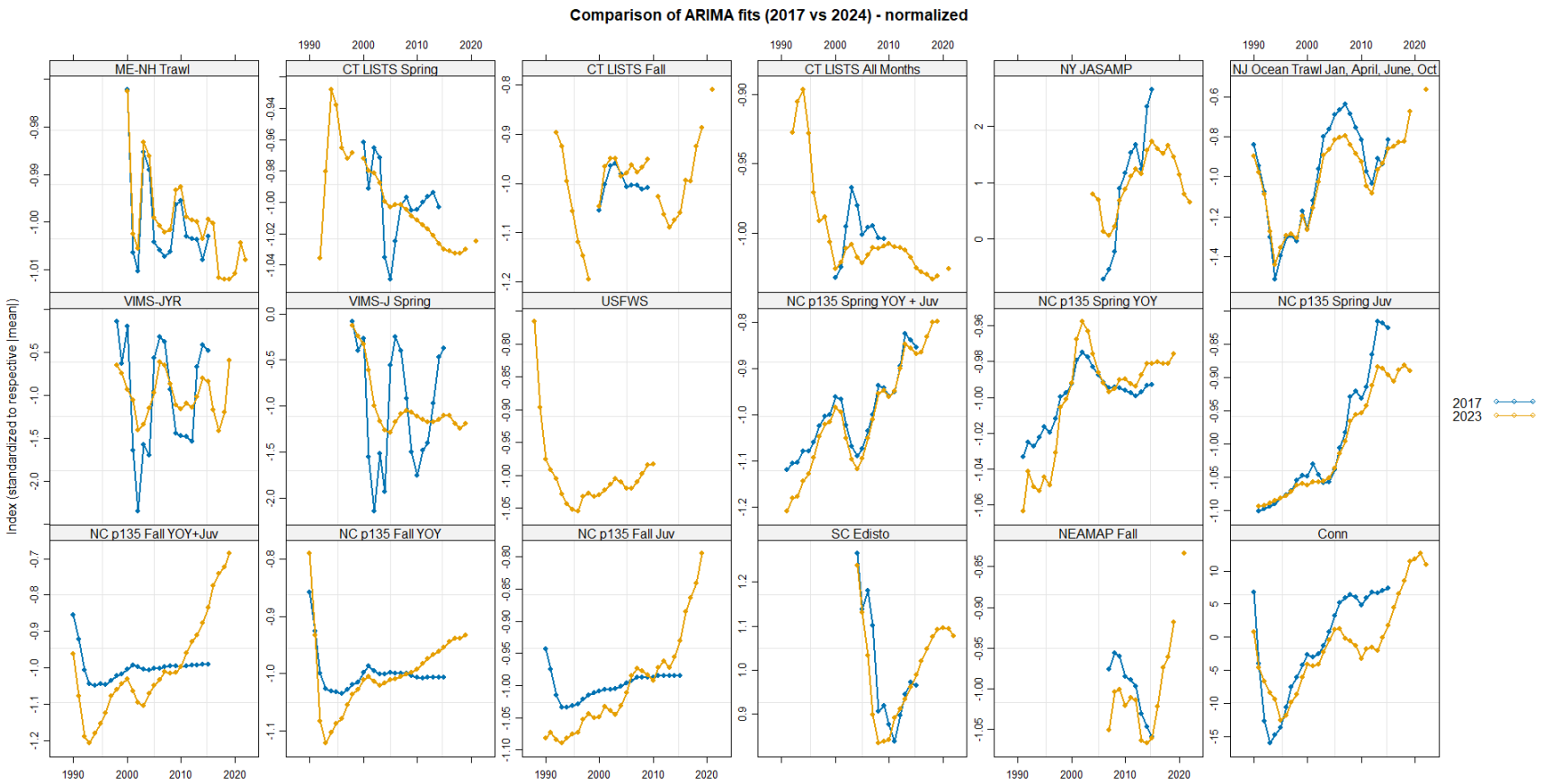


Figure 16. ARIMA fits from indices fit in ASMFC (2017) with those fit in 2024 (labelled 2023). Indices have been scaled to the absolute value of their respective mean. Note that USFWS index was 100% unchanged from ASMFC (2017) due to the termination of that timeseries in 2010.

Figure 17. Probabilities that the terminal year of a given index is greater than the 25th percentile of its time series. The plotted point represents the probability that the terminal year of the index is greater than the 25th percentile of the index assuming the survey started in the plotted year. A dotted horizontal line is added at probability = 0.50 (min credible probability). A red box is drawn around indices where credibility of terminal year being above the 25th percentile of a given time series changes with start year, suggesting some sensitivity of the results to the survey start year.

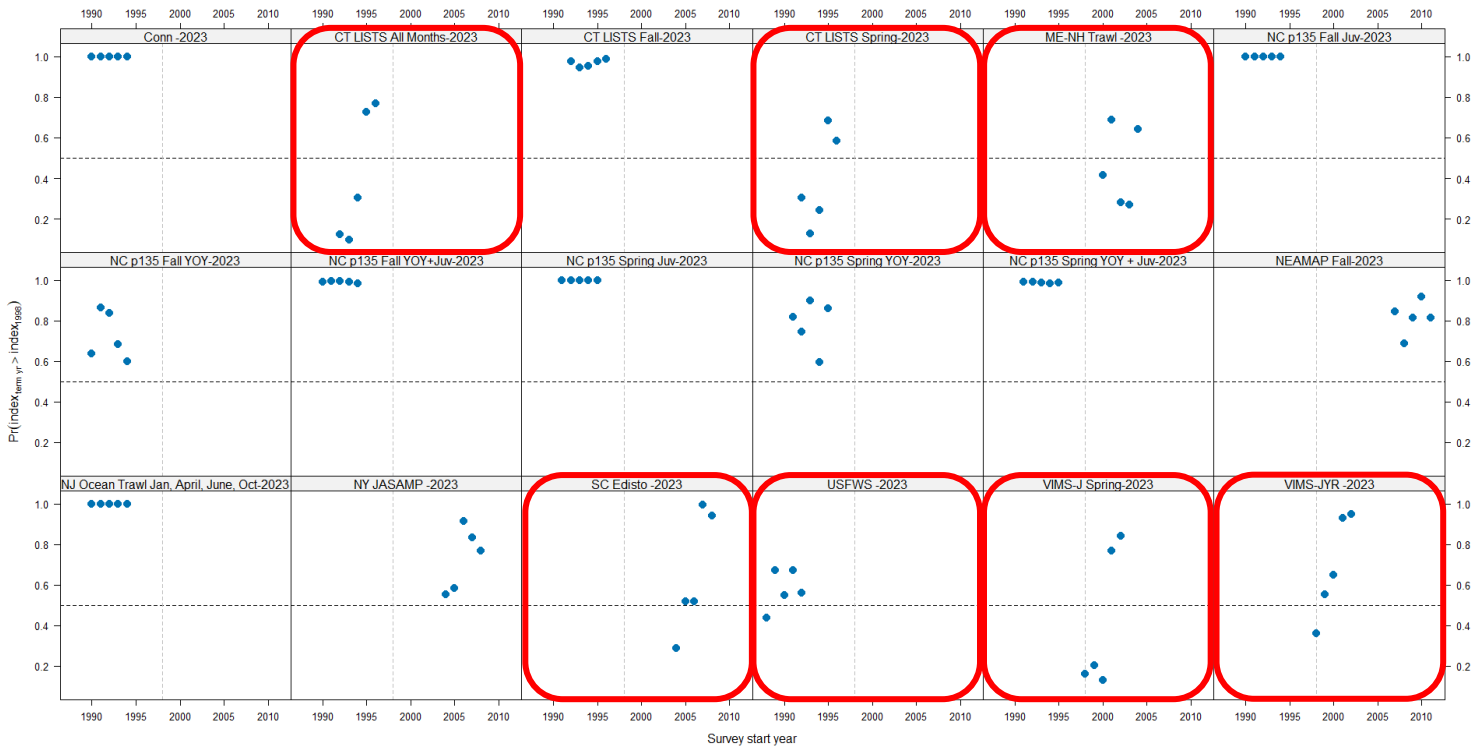


Figure 18. Probabilities that the terminal year of a given index is greater than the index value in 1998*; a vertical dotted line is added at 1998. The plotted point represents the probability that the terminal year of the index is greater than the index value in 1998* assuming the survey started in the plotted year. A dotted horizontal line is added at probability = 0.50 (min credible probability). A red box is drawn around indices where credibility of terminal year being above the 1998 index value of a given time series changes with start year, suggesting some sensitivity of the results to the survey start year. * For surveys that started after 1998, what is plotted is the probability that the terminal year is greater than the index in the plotted year, so that in those cases, the comparisons are against a moving set of years [e.g., SC Edisto: Pr(2023 index > 2004 index = 0.29 (assuming index started in 2004), …, Pr(2023 index > 2007 index = 0.94 (assuming index started in 2007)].

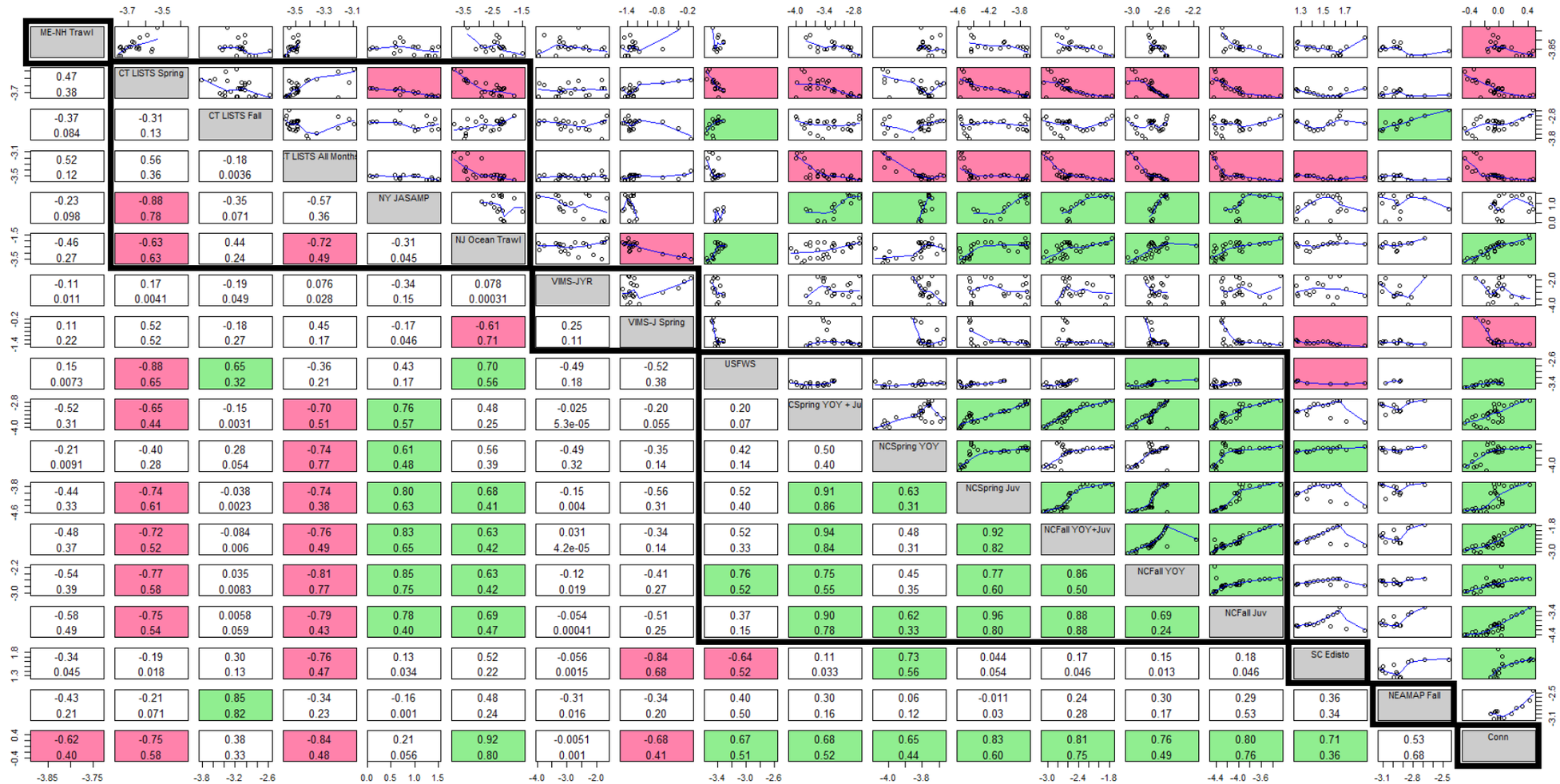


Figure 19. Correlation matrix of ARIMA fits to surveys. Spearman correlations below diagonal (top row), notable correlations (≥ 0.60 or ≤ -0.60) are indicated in green or red, respectively; r^2 below diagonal (bottom row). Lowess smoother added to scatterplots above the diagonal. Index name along the diagonal. Black boxes are drawn around surveys within a single DPS to help illustrate trends within a DPS or regional index (e.g., NEAMAP, Conn).

APPENDICES

a. Tagging Model Supplemental Results

Table A1. Results of Cormack-Jolly Seber model for all size Atlantic sturgeon for all DPSs. The mean and percentile *S* values are presented, along with mean *P* estimates. The mean *S* estimates were reported for the benchmark assessment, but due to skewness in the posterior distributions, the peer review panel recommended using median values for the *S* estimates (bold). Estimate of *P* are the mean or range of monthly means depending on if the preferred model for that DPS used the single or monthly *P* estimate.

DPS	N	TL Range (cm)	Mean	sd	2.50%	25%	50%	75%	97.50%	*P*
GM	224	29-237	0.81	0.16	0.34	0.76	**0.86**	0.92	0.98	0.02-0.34
NY	534	26-268	0.91	0.10	0.63	0.88	**0.94**	0.97	1.00	0.31
CH	464	25-240	0.93	0.09	0.67	0.91	**0.95**	0.98	1.00	0.09-0.49
CA	489	30-265	0.92	0.10	0. 63	0.90	**0.95**	0.98	1.00	0.42
SA	364	28-267	0.90	0.12	0.60	0.87	**0.93**	0.97	1.00	0.12-0.54
All	2,075	25-268	0.98	0.03	0.89	0.98	**0.99**	0.99	1.00	0.11-0.47

Table A2. Results of Cormack-Jolly Seber model for Atlantic sturgeon < 1300 mm for all DPSs. The mean and percentile *S* values are presented, along with mean *P* estimates. The mean *S* estimates were reported for the benchmark assessment, but due to skewness in the posterior distributions, the peer review panel recommended using median values for the *S* estimates (bold). Estimate of *P* are the mean or range of monthly means depending on if the preferred model for that DPS used the single or monthly *P* estimate.

DPS	N	TL Range (cm)	Mean	sd	2.50%	25%	50%	75%	97.50%	*P*
GM	55	29-129	0.56	0.25	0.09	0.37	**0.58**	0.76	0.96	0.29
NY	144	26-129	0.82	0.16	0.41	0.75	**0.86**	0.93	0.99	0.33
CH	74	25-128	0.77	0.18	0.27	0.69	**0.82**	0.90	0.98	0.15-0.50
CA	208	30-129	0.86	0.13	0.47	0.82	**0.90**	0.95	0.99	0.37
SA	133	28-124	0.81	0.17	0.33	0.74	**0.86**	0.93	0.99	0.21-0.51
All	614	25-129	0.94	0.08	0.71	0.92	**0.96**	0.98	1.00	0.34

Table A3. Results of Cormack-Jolly Seber model for Atlantic sturgeon > 1300 mm for all DPSs.The mean and percentile *S* values are presented, along with mean *P* estimates. The mean *S* estimates were reported for the benchmark assessment, but due to skewness in the posterior distributions, the peer review panel recommended using median values for the *S* estimates (bold). Estimate of *P* are the mean or range of monthly means depending on if the preferred model for that DPS used the single or monthly *P* estimate.

DPS	N	TL Range (cm)	Mean	sd	2.50%	25%	50%	75%	97.50%	*P*
GM	169	130-237	0.77	0.19	0.22	0.69	**0.82**	0.91	0.98	0.04-0.31
NY	390	130-268	0.86	0.13	0.55	0.81	**0.89**	0.94	0.99	0.30
CH	390	130-240	0.90	0.10	0.60	0.87	**0.93**	0.97	1.00	0.33
CA	281	130-265	0.87	0.12	0. 57	0.82	**0.90**	0.95	0.99	0.47
SA	231	130-267	0.83	0.16	0.38	0.77	**0.88**	0.94	0.99	0.09-0.55
All	1,461	130-268	0.96	0.05	0.83	0.96	**0.98**	0.99	1.00	0.31

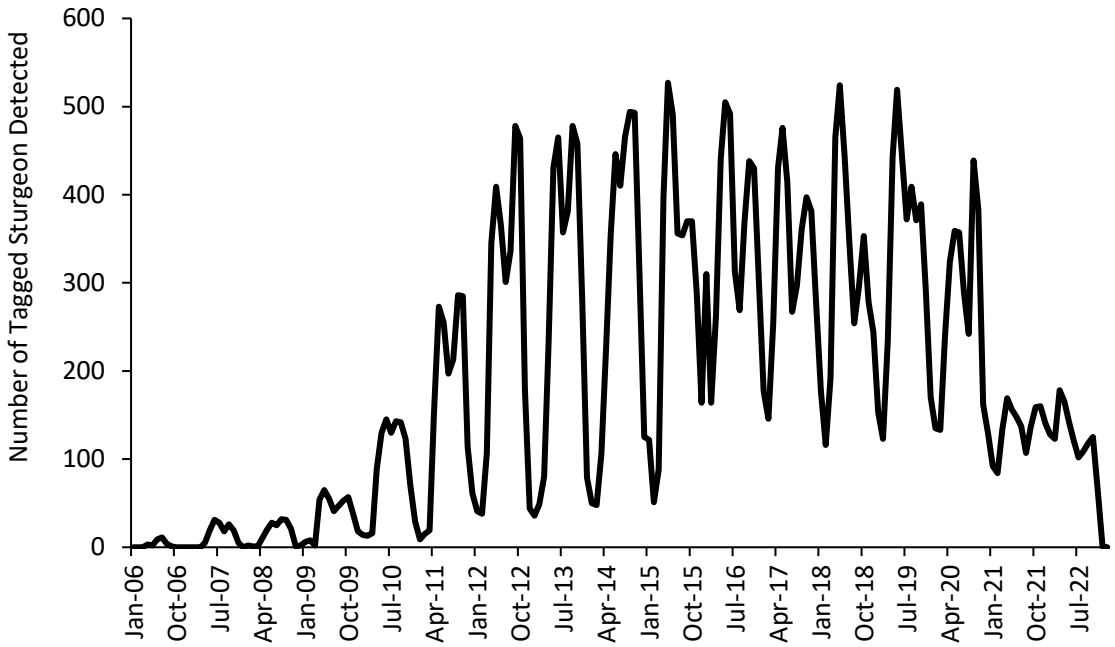


Figure A1. Total number of tagged sturgeon detected weekly over time for all DPSs.

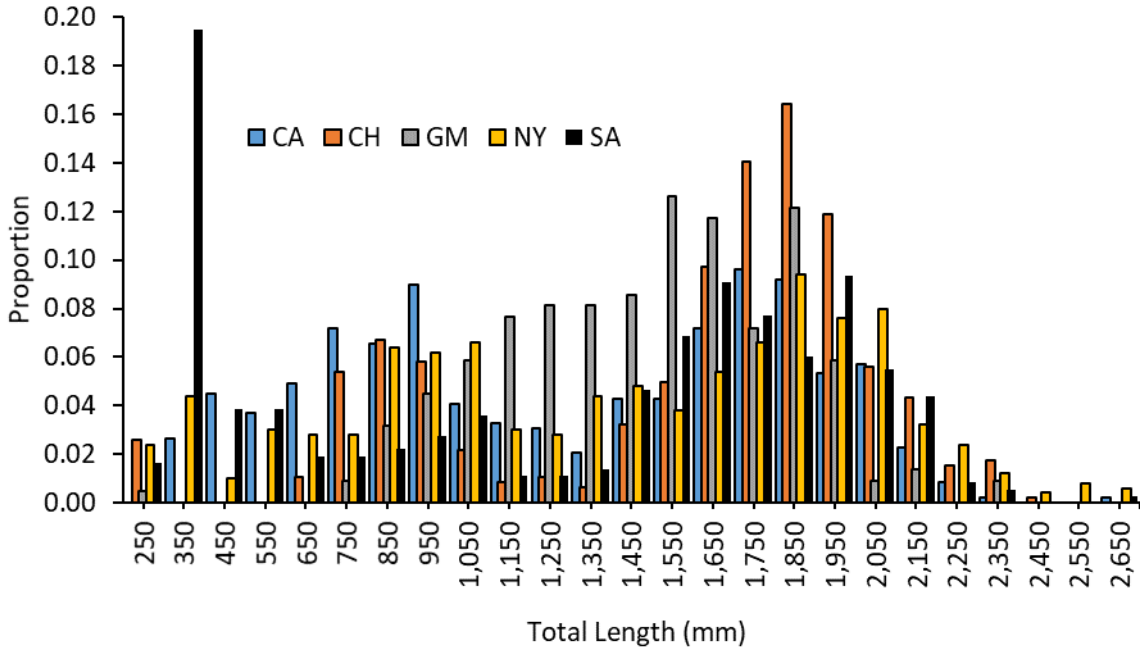


Figure A2. Length-frequency of all tagged Atlantic sturgeon by assigned DPS.

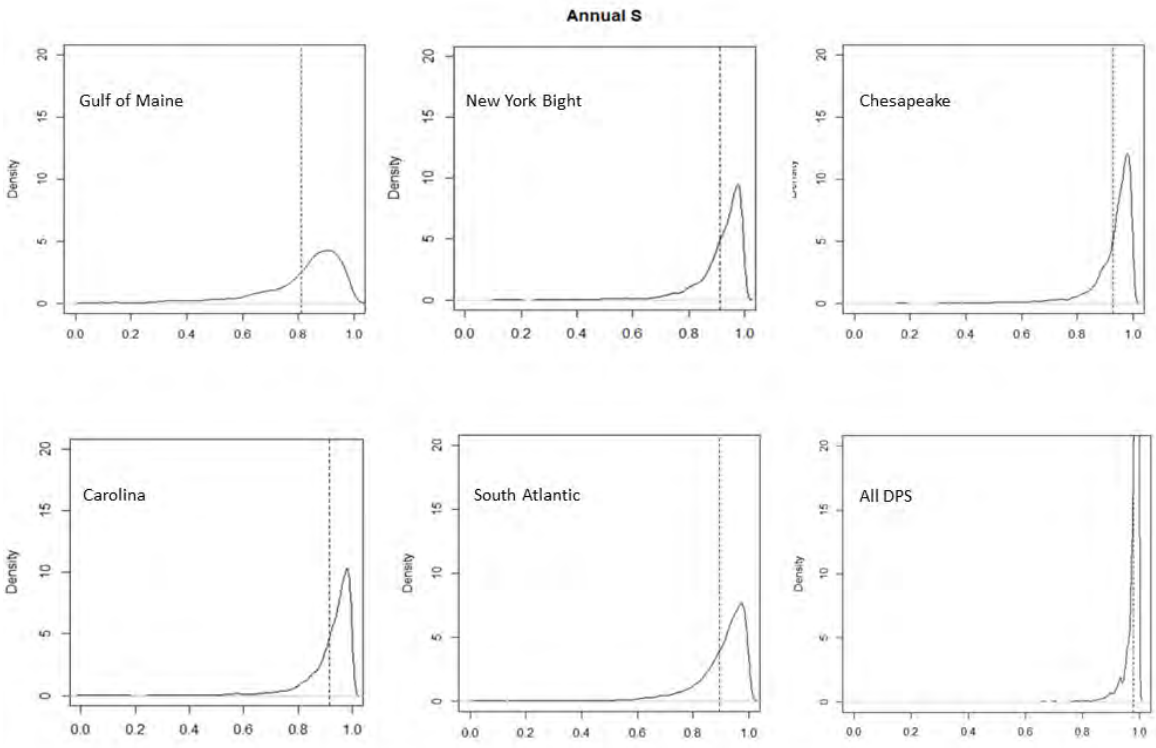


Figure A3. Posterior distributions for estimates of *S* for all sized tagged Atlantic sturgeon. Results are for the best model for each DPS. Dotted vertical line represents the mean *S* estimate.

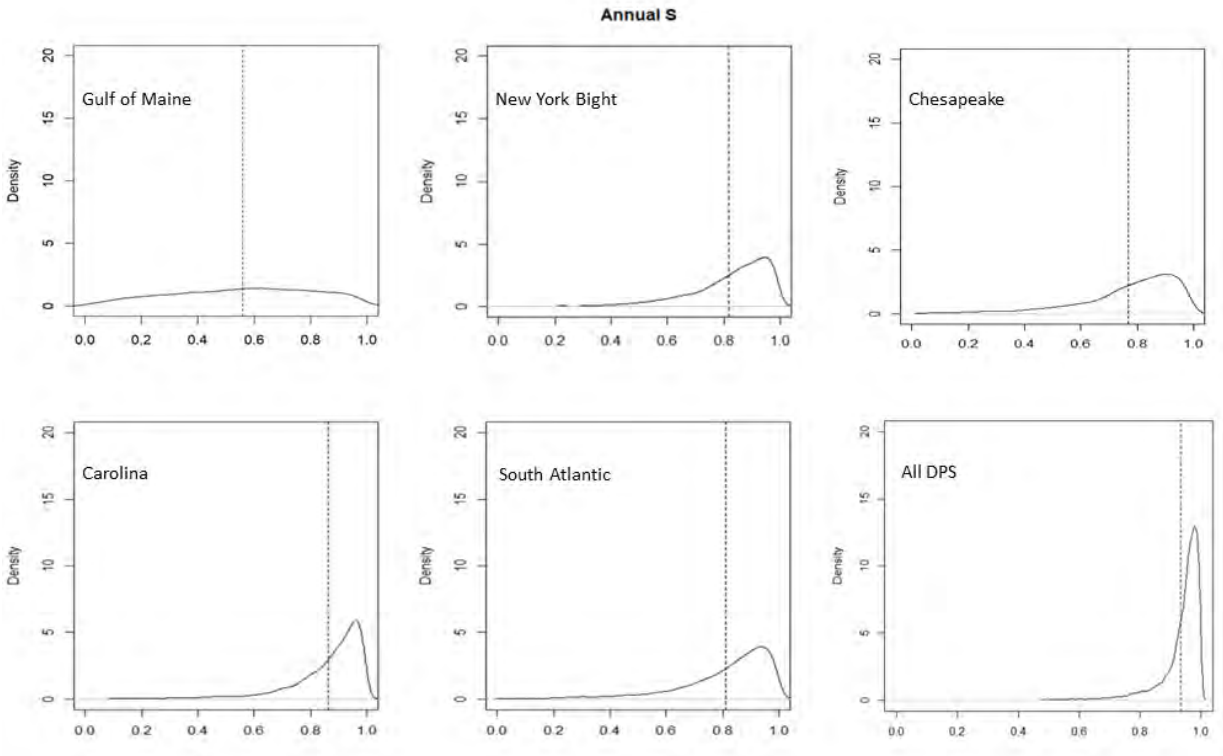


Figure A4. Posterior distributions for estimates of *S* for tagged Atlantic sturgeon < 1300 mm. Results are for the best model for each DPS. Dotted vertical line represents the mean *S* estimate.

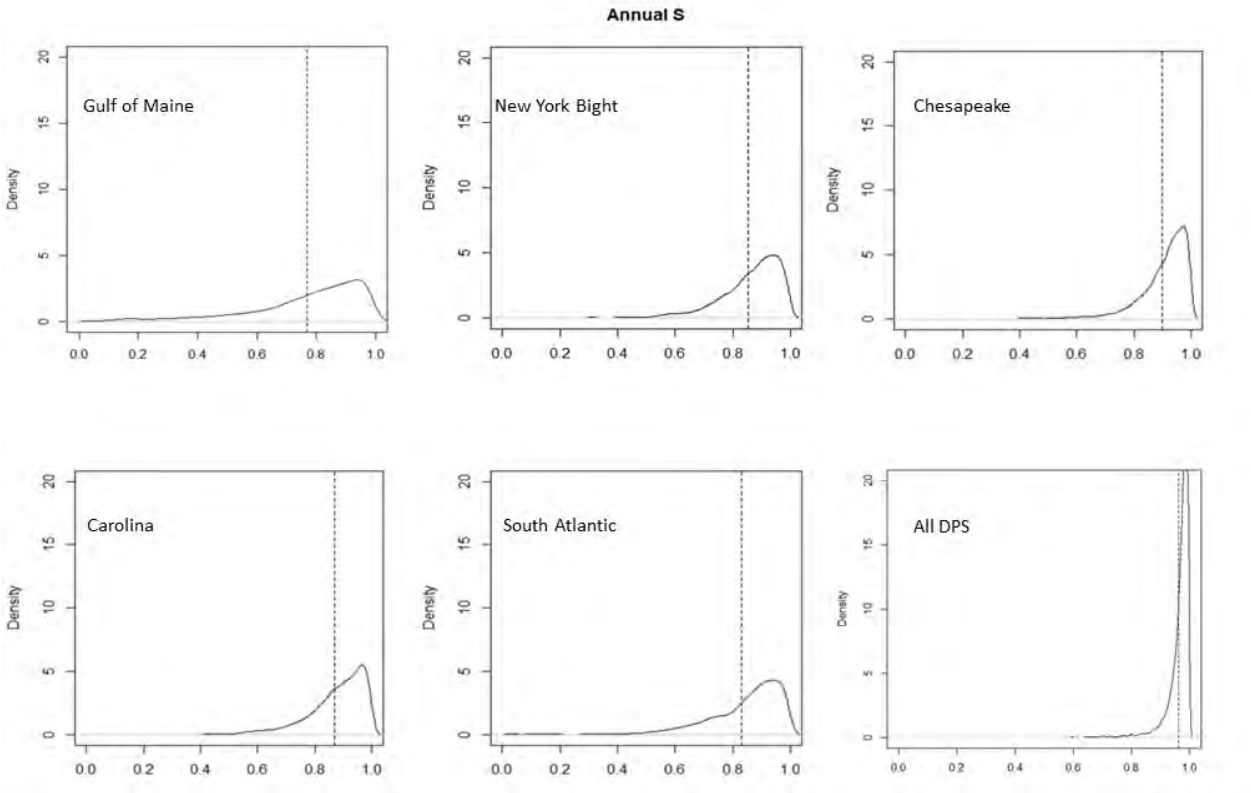


Figure A5. Posterior distributions for estimates of *S* for tagged Atlantic sturgeon >1300 mm. Results are for the best model for each DPS. Dotted vertical line represents the mean *S* estimate.

b. Standardized Indices of Abundance

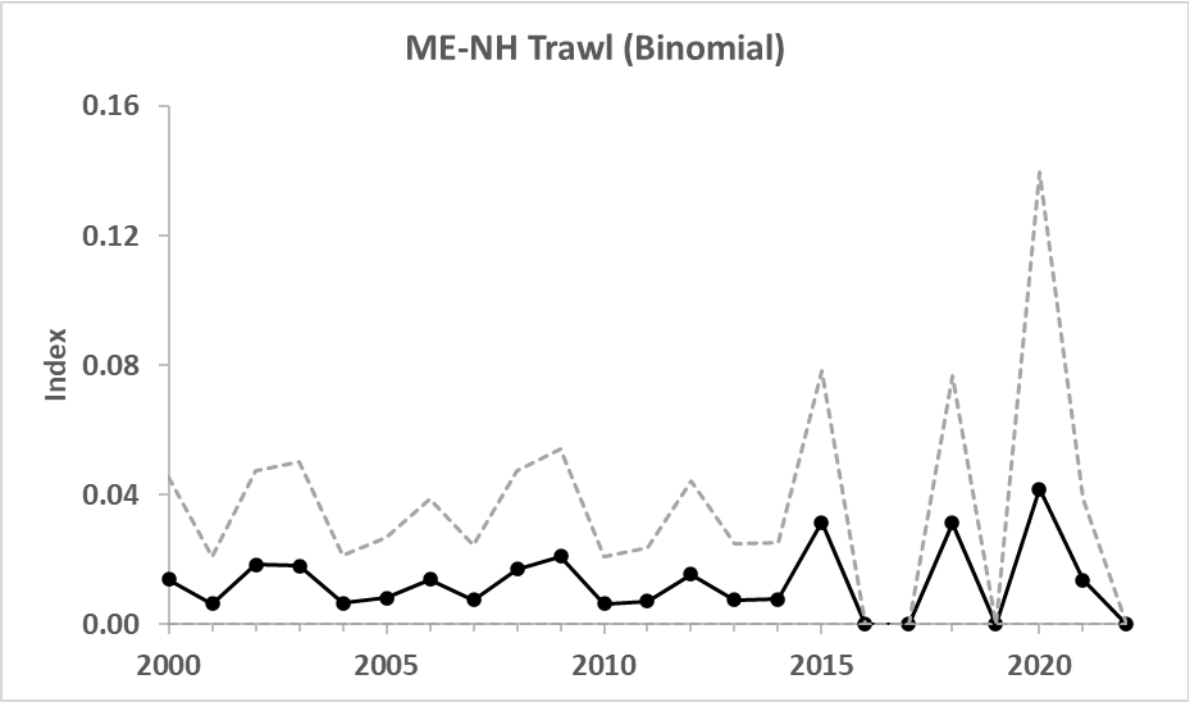


Figure A6. Standardized index of relative abundance of Atlantic sturgeon developed from the Maine-New Hampshire Trawl Survey with 95% confidence intervals.

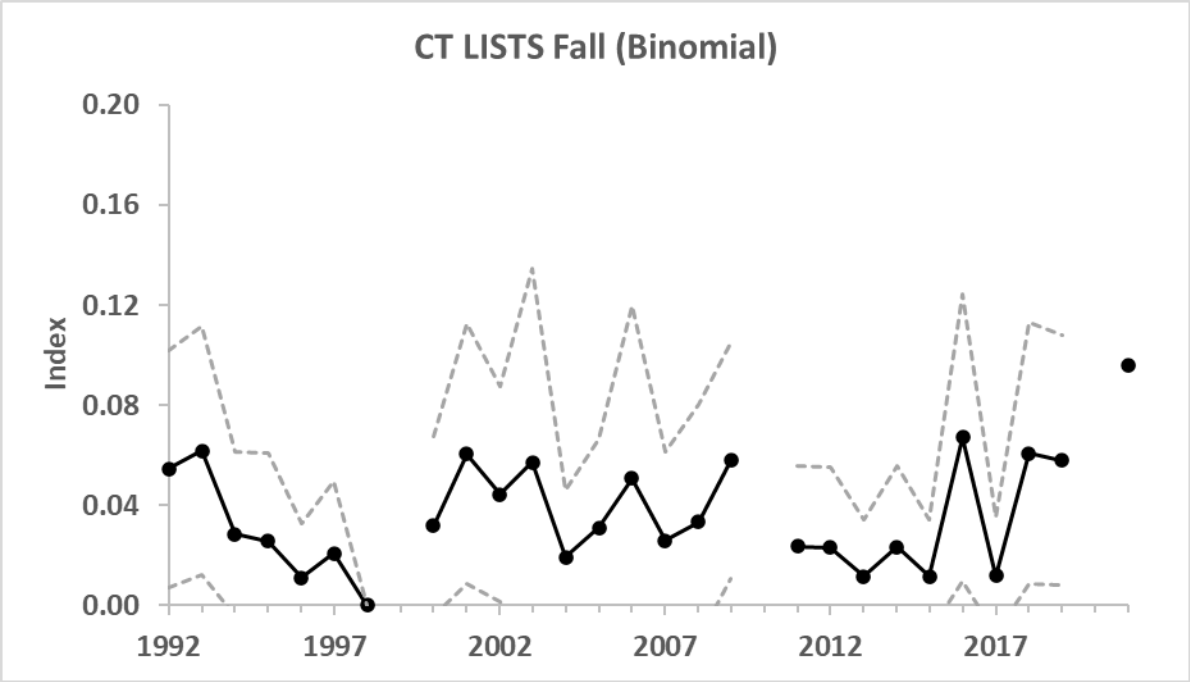


Figure A7. Standardized index of relative abundance of Atlantic sturgeon developed from the Connecticut Long Island Sound Trawl Survey in the fall with 95% confidence intervals.

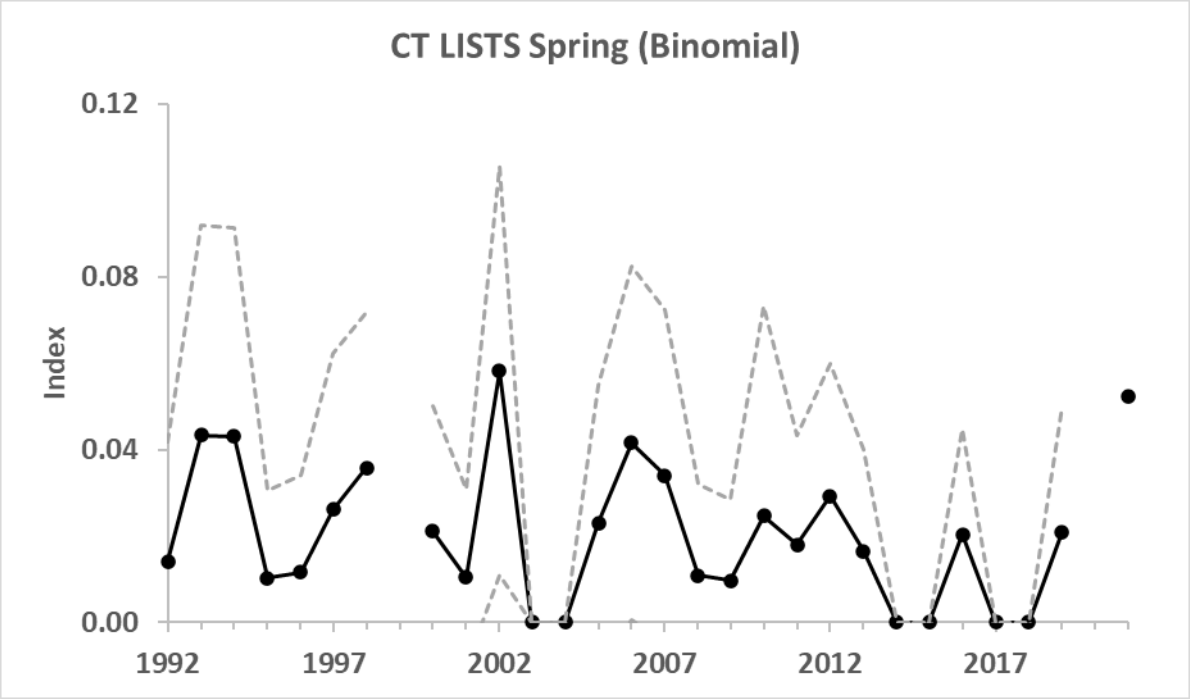


Figure A8. Standardized index of relative abundance of Atlantic sturgeon developed from the Connecticut Long Island Sound Trawl Survey in the spring with 95% confidence intervals.

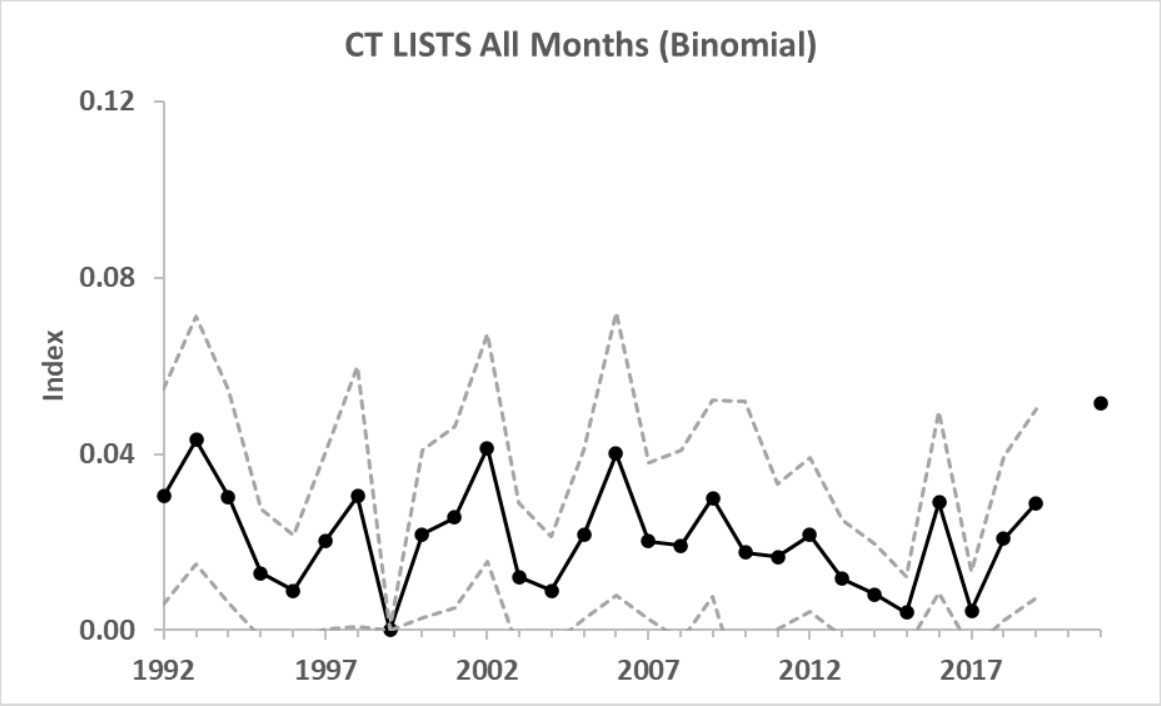


Figure A9. Standardized index of relative abundance of Atlantic sturgeon developed from the Connecticut Long Island Sound Trawl Survey for all months with 95% confidence intervals.

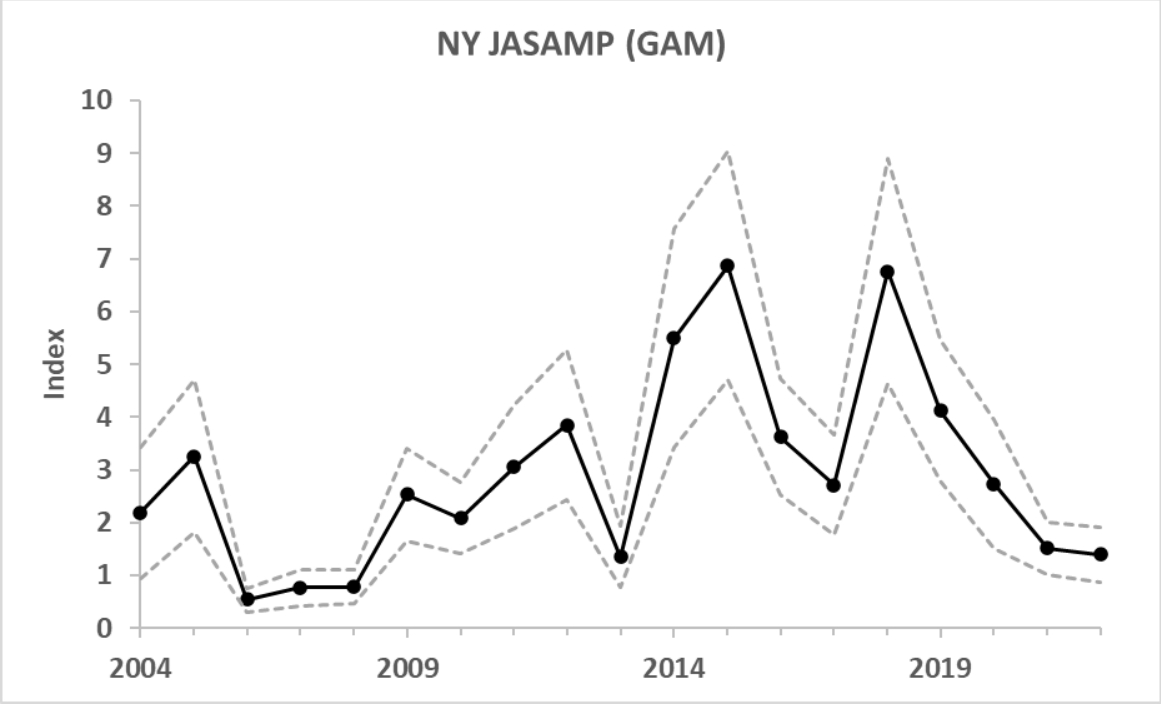


Figure A10. Standardized index of relative abundance of Atlantic sturgeon developed from the NYDEC JASAMP survey with 95% confidence intervals.

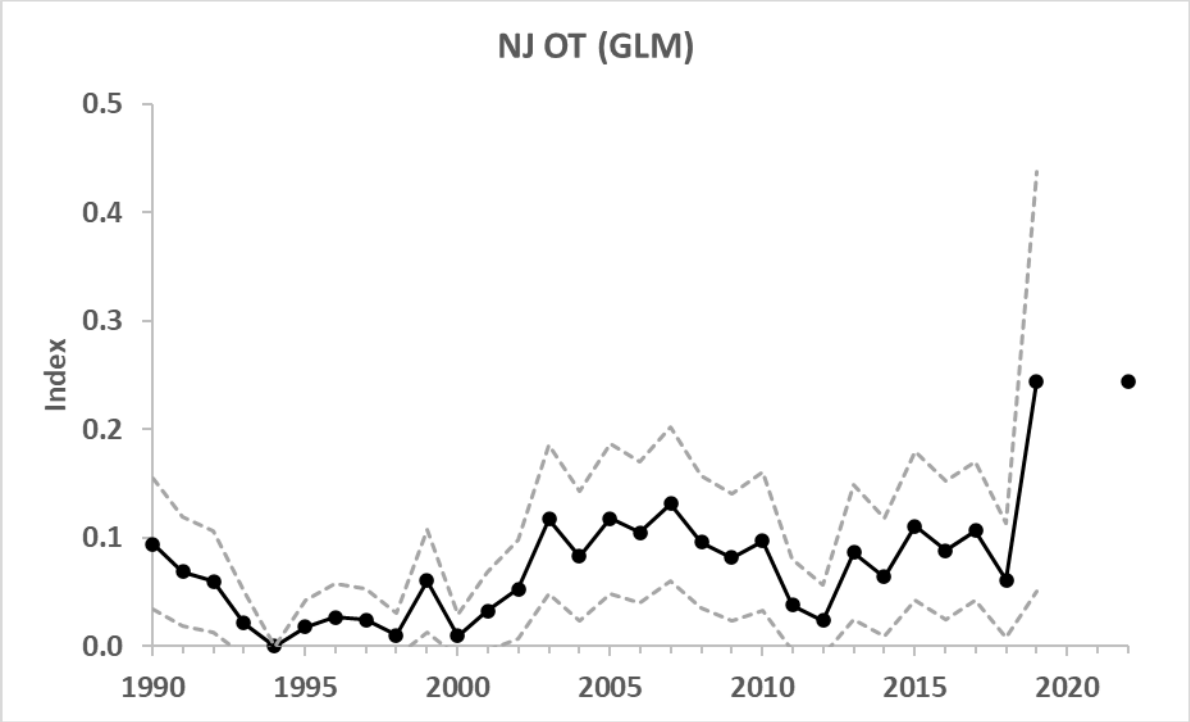


Figure A11. Standardized index of relative abundance of Atlantic sturgeon developed from the New Jersey Ocean Trawl Survey with 95% confidence intervals.

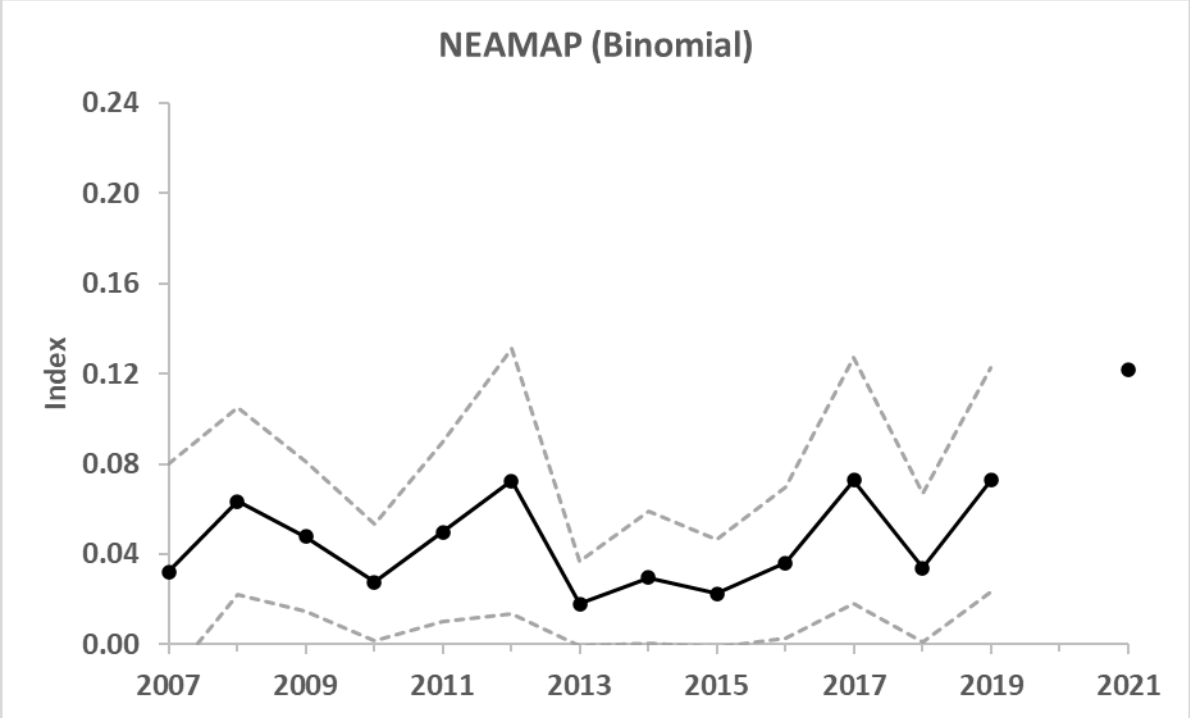


Figure A12. Standardized index of relative abundance of Atlantic sturgeon developed from the NEAMAP Survey in the fall with 95% confidence intervals.

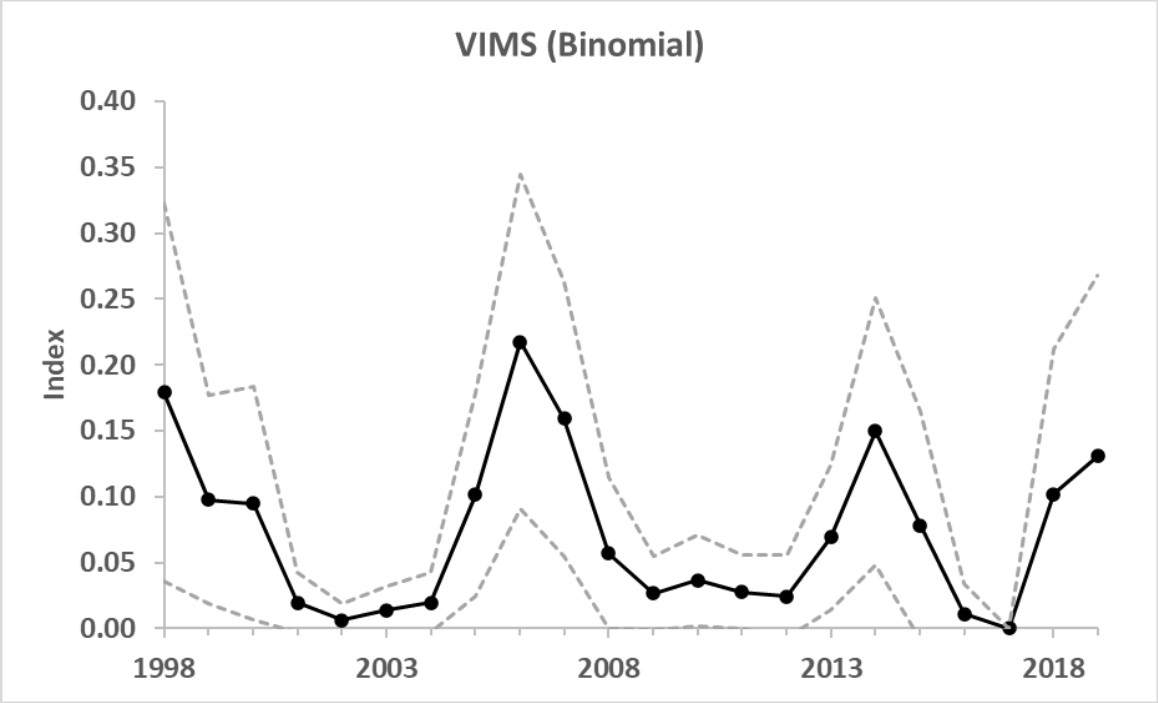


Figure A13. Standardized index of relative abundance of Atlantic sturgeon developed from the VIMS Shad and River Herring Monitoring Survey with 95% confidence intervals.

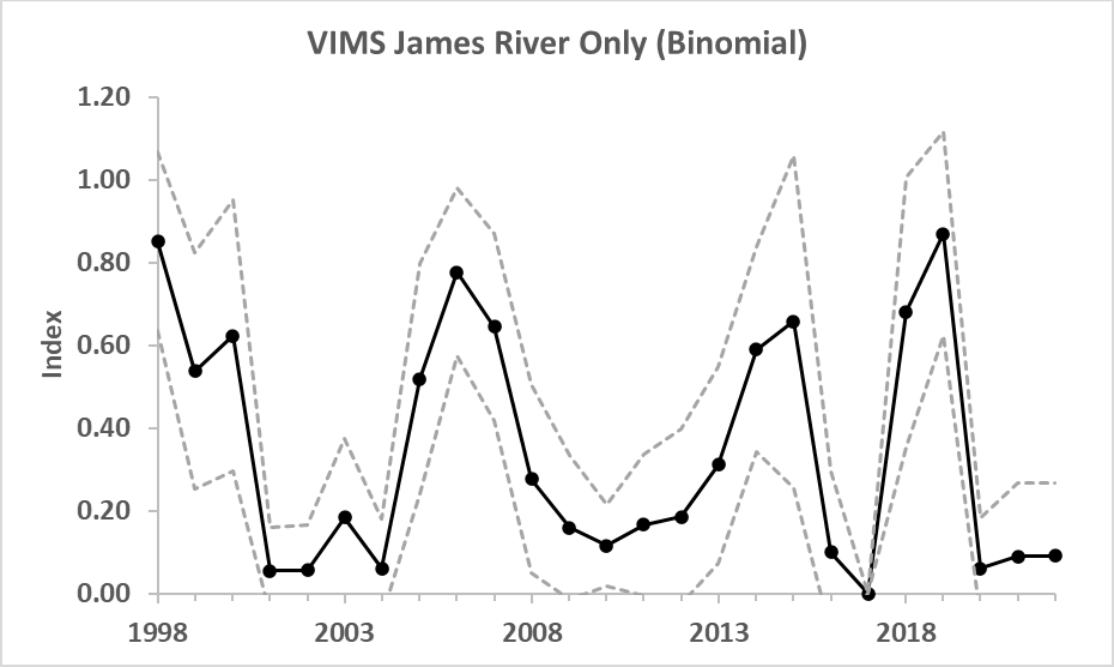


Figure A14. Standardized index of relative abundance of Atlantic sturgeon developed from the VIMS Shad and River Herring Monitoring Survey for the James River only with 95% confidence intervals.

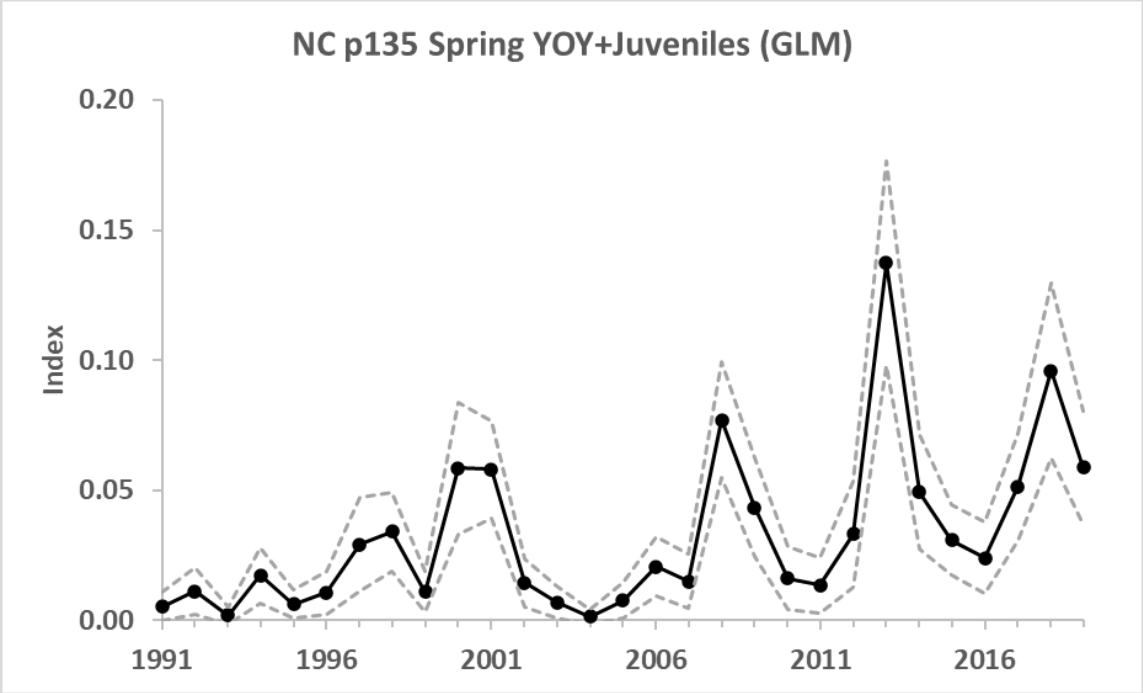


Figure A15. Standardized index of relative abundance of Atlantic sturgeon developed from the spring component of the NC p135 Survey for YOY and juveniles with 95% confidence intervals.

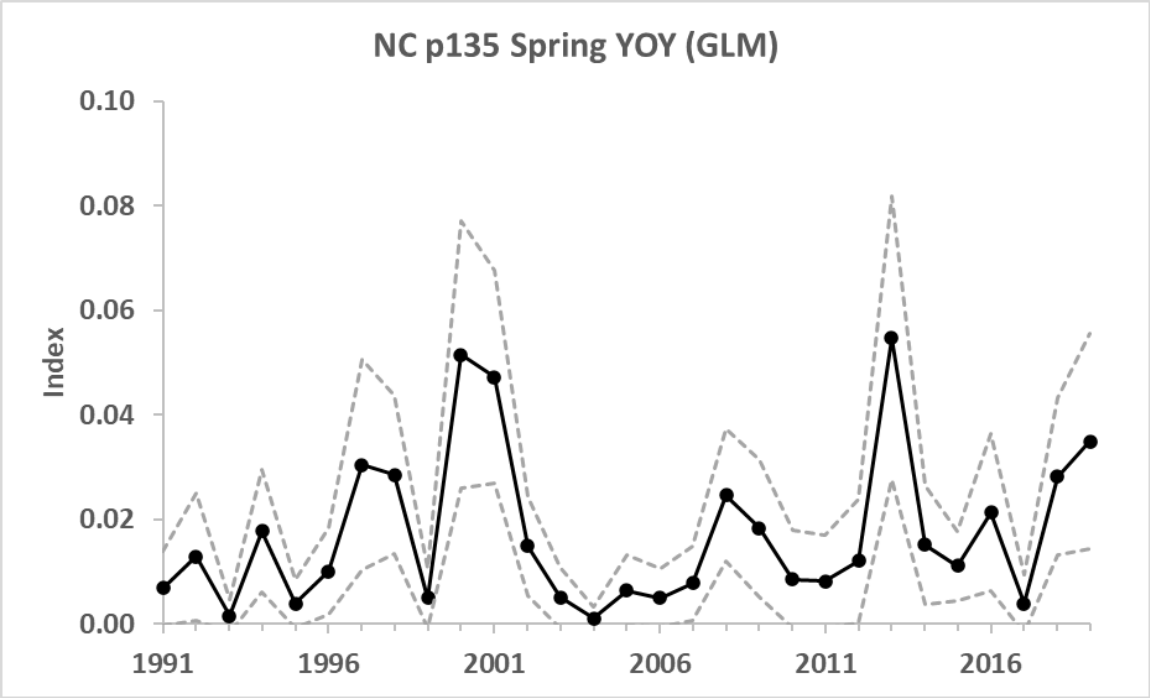


Figure A16. Standardized index of relative abundance of Atlantic sturgeon developed from the spring component of the NC p135 Survey for YOY with 95% confidence intervals.

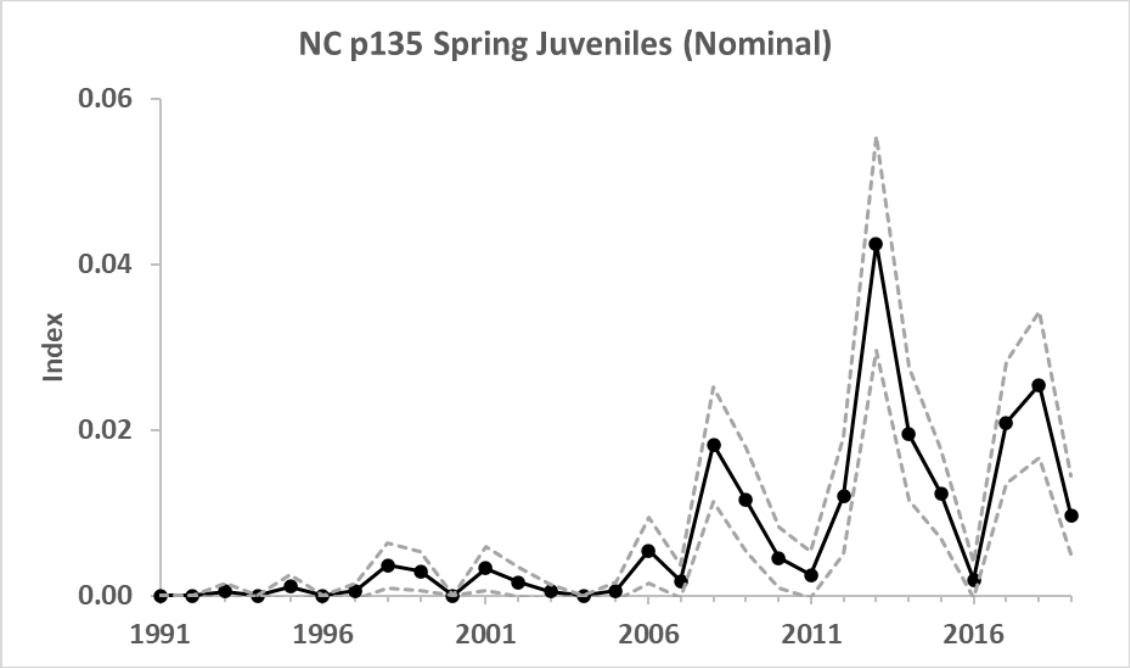


Figure A17. Standardized index of relative abundance of Atlantic sturgeon developed from the spring component of the NC p135 Survey for juveniles with 95% confidence intervals.

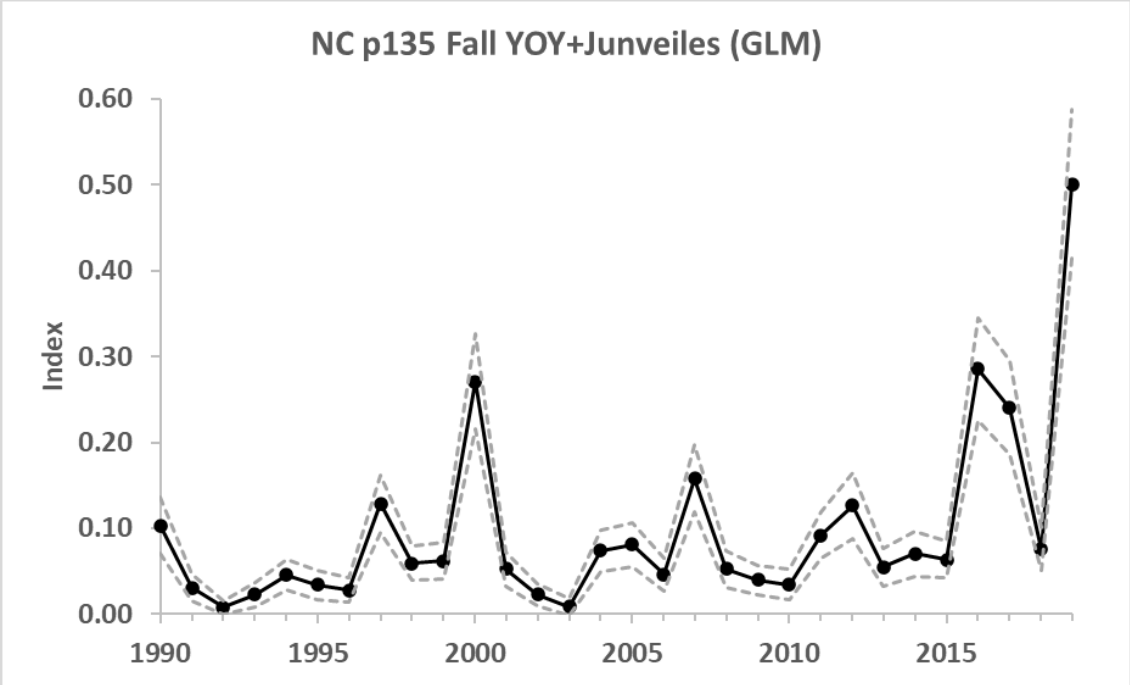


Figure A18. Standardized index of relative abundance of Atlantic sturgeon developed from the fall component of the NC p135 Survey for YOY and juveniles with 95% confidence intervals.

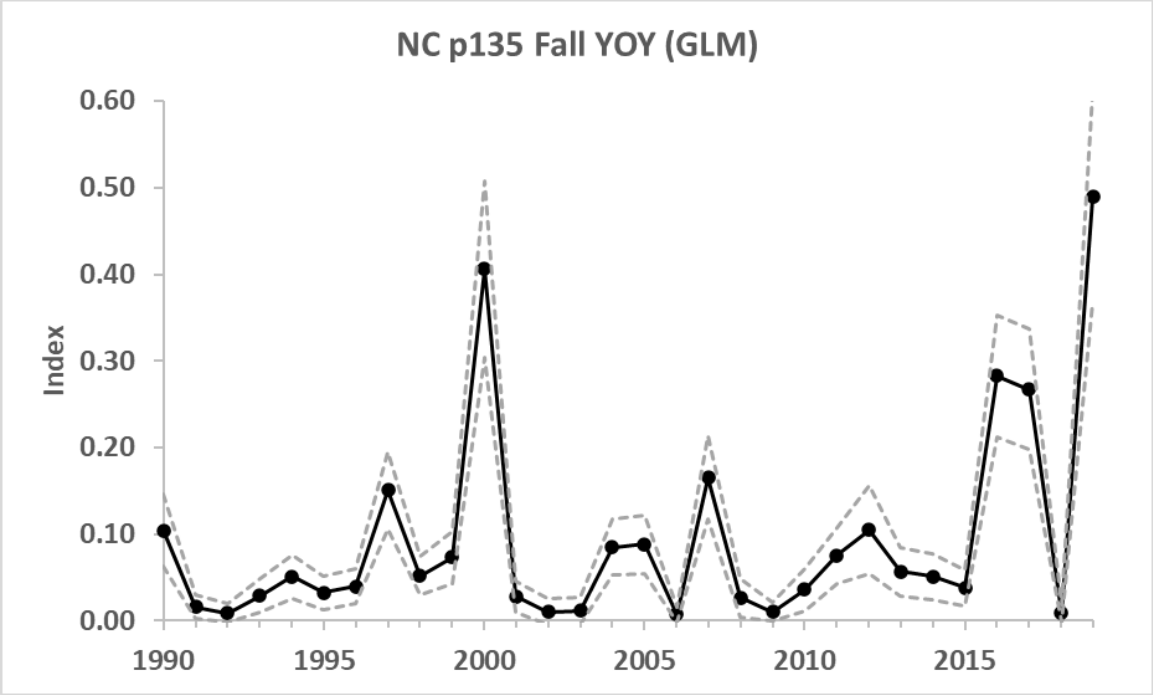


Figure A19. Standardized index of relative abundance of Atlantic sturgeon developed from the fall component of the NC p135 Survey for YOY with 95% confidence intervals.

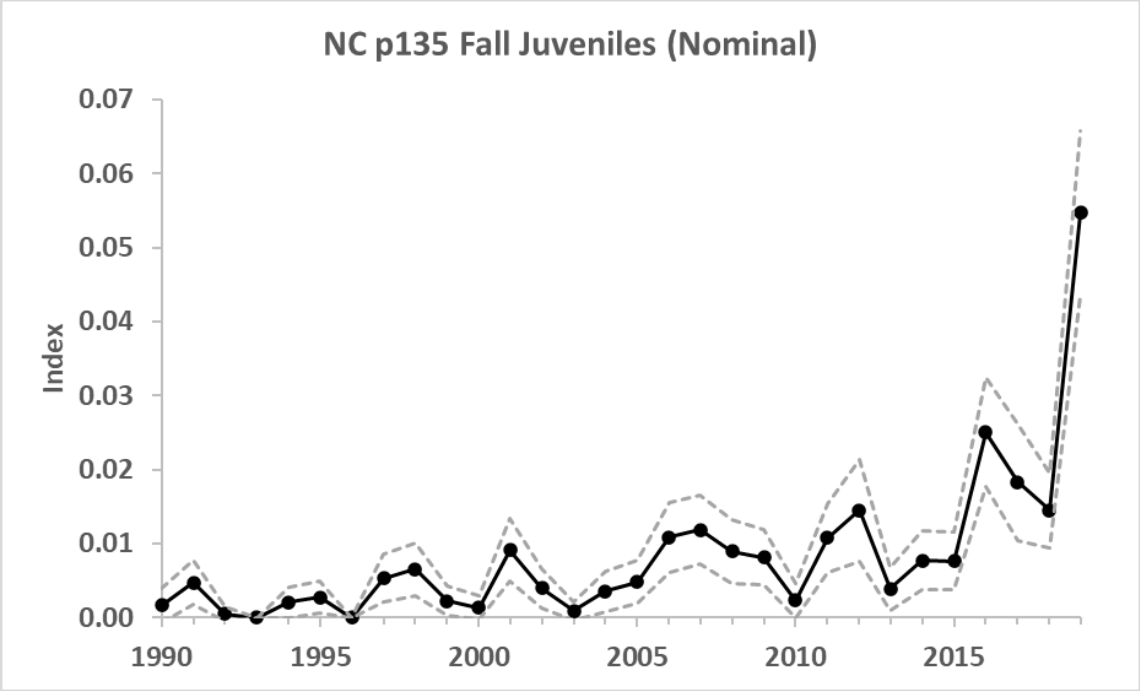


Figure A20. Standardized index of relative abundance of Atlantic sturgeon developed from the fall component of the NC p135 Survey for juveniles with 95% confidence intervals.

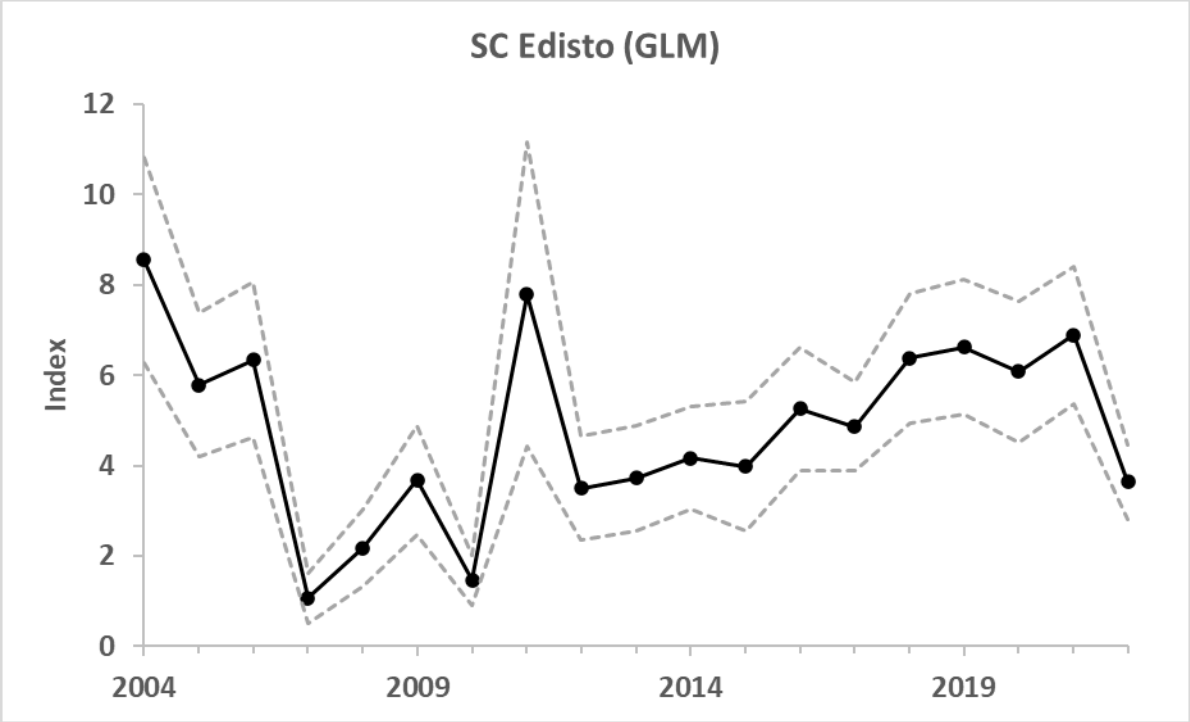


Figure A21. Standardized index of relative abundance of Atlantic sturgeon developed from the SC Edisto Survey with 95% confidence intervals.

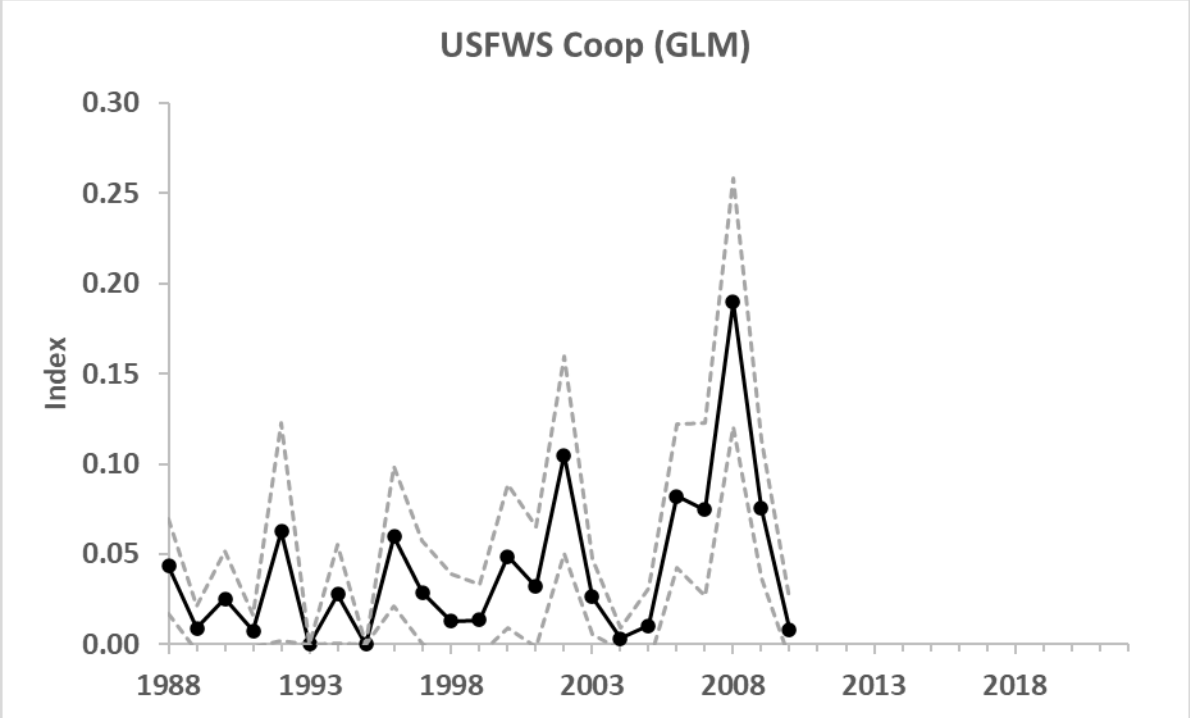


Figure A22. Standardized index of relative abundance of Atlantic sturgeon developed from the USFWS Cooperative Cruise with 95% confidence intervals.

c. Supplemental ARIMA Results

Gulf of Maine DPS

Maine-New Hampshire Trawl Survey

Descriptive statistics for the ME-NH Trawl Survey ARIMA are provided in Table 11. The fitted index started at the time series high value, has oscillated over time, generally decreasing, and ended the time series at a comparatively low level (Figure 13-Figure 15). The Mann-Kendall test did detect a significant (α = 0.05) declining trend in the time series. The terminal year index is credibly above the 25th percentile of the timeseries, but not the index value at the start of the timeseries (Table 12). The retrospective analysis suggests that conclusions regarding comparisons between terminal year and start year are sensitive to the start year of the survey, but not against the 25th percentile of the time series (Figure 17-Figure 18).

New York Bight DPS

Connecticut Long Island Sound Trawl Survey (Fall)

Descriptive statistics for the CT LIST Survey (fall) ARIMA are provided in Table 11. The fitted index starts the time series at a comparatively high level, oscillated over time and in recent years is trending upwards, with the terminal year at a time series high (Figure 13-Figure 15). The Mann-Kendall test did not detect a significant (α = 0.05) trend in the time series. The terminal year index is credibly above the 25th percentile of the timeseries and the fitted value in 1998 (Table 12). The retrospective analysis suggests that these conclusions are not sensitive to the start year of the survey (Figure 17-Figure 18).

Connecticut Long Island Sound Survey (Spring)

Descriptive statistics for the CT LIST Survey (spring) ARIMA are provided in Table 11. The fitted index starts at the time series low, increased rapidly, peaking in 1994, declined over time through about 2015, before starting a modest upward trend (Figure 13-Figure 15). The Mann-Kendall test detected a significant (α= 0.05) downward trend in the time series. The terminal year index is credibly above the 25th percentile of the time series, but not the fitted index value in 1998 (Table 12). The retrospective analysis suggests that these conclusions are sensitive to the start year of the survey (Figure 17-Figure 18).

Connecticut Long Island Sound Survey (All Months)

Descriptive statistics for the CT LIST Survey (all months) ARIMA are provided in Table 11. The fitted index starts near the time series high, increased for 2 years before declining markedly through the late 1990s, after which the index stabilized through about 2013. The index declined after 2013 but has increased slightly in the most recent 2 years available (Figure 13-Figure 15). The Mann-Kendall test detected a significant (α = 0.05) downward trend in the time series. The terminal year index is not credibly above the 25th percentile of the time series or the fitted

index value in 1998 (Table 12). The retrospective analysis suggests that these conclusions are sensitive to the start year of the survey (Figure 17-Figure 18).

New York JASAMP

Descriptive statistics for the JASAMP Survey ARIMA are provided in Table 11. The fitted index has oscillated over time, with a declining trend in the most recent several years, ending the time series at a value near where it began (Figure 13-Figure 15). The Mann-Kendall test did not detect a significant (α = 0.05) trend in the time series. The terminal year index is credibly above the 25th percentile of the time series and the fitted index value from the start of the time series (Table 12). Figure 13 shows that the point estimate of the terminal year index is below the index value from the first year of the survey, but the distribution of bootstrapped values validates the Table 12 conclusion. The retrospective analysis suggests that these conclusions are sensitive to the start year of the survey with respect to comparison against the 25th percentile, but not against the start year of the survey (Figure 17-Figure 18).

New Jersey Ocean Trawl

Descriptive statistics for the NJ Ocean Trawl Survey ARIMA are provided in Table 11. The fitted index declined through the mid-1990s (the time of commercial fishery closure in NJ) after which it increased, initially peaking in the mid-2000s, before dipping slightly and again rising to a time series high (Figure 13-Figure 15). The Mann-Kendall test detected a significant (α = 0.05) increasing trend in the time series. The terminal year index is credibly above the 25th percentile of the time series and the fitted index value in 1998 (Table 12). The retrospective analysis suggests that these conclusions are not sensitive to the start year of the survey (Figure 17-Figure 18).

Chesapeake Bay DPS

VIMS-James, York, and Rappahannock Rivers (Spring)

Descriptive statistics for the VIMS-JYR Survey (spring) ARIMA are provided in Table 11. The fitted index has oscillated over time, starting near the time series high, reaching a comparable level near the middle of the time series, and ending at the time series high (Figure 13-Figure 15). The Mann-Kendall test did not detect a significant (α = 0.05) trend in the time series. The terminal year index is credibly above the 25th percentile of the time series but not the fitted index value in 1998 (Table 12). The retrospective analysis suggests that conclusions regarding comparisons between terminal year and 1998 are sensitive to the start year of the survey, but not against the 25th percentile of the time series (Figure 17-Figure 18).

VIMS-James River (Spring)

Descriptive statistics for the VIMS-J Survey (spring) ARIMA are provided in Table 11. The fitted index started at the time series high, decreased dramatically through 2005, after which it varied without trend for the remainder of the time series (Figure 13-Figure 15). The Mann-Kendall test

detected a significant (α = 0.05) downward trend in the time series. The terminal year index is not credibly above the 25th percentile of the time series or the fitted index value in 1998 (Table 12). The retrospective analysis suggests that these conclusions are sensitive to the start year of the survey (Figure 17-Figure 18).

Carolina DPS

North Carolina p135 (YOY and Juvenile; Spring)

Descriptive statistics for this survey ARIMA are provided in Table 11. The fitted index started at the time series low value but has generally increased over time (save a relatively steep decline between 2001-2004), ending at time series high value (Figure 13-Figure 15). The Mann-Kendall test detected a significant (α = 0.05) increasing trend in the time series. The terminal year index is credibly above the 25th percentile of the time series and the fitted index value in 1998 (Table 12). The retrospective analysis suggests that these conclusions are not sensitive to the start year of the survey (Figure 17-Figure 18).

North Carolina p135 (YOY; Spring)

Descriptive statistics for this survey ARIMA are provided in Table 11. The fitted index started at the time series low value, generally increased through 2002, subsequently decline through 2007, before generally gradually increasing (Figure 13-Figure 15). The Mann-Kendall test detected a significant (α = 0.05) increasing trend in the time series. The terminal year index is credibly above the 25th percentile of the time series and the fitted index value in 1998 (Table 12). The retrospective analysis suggests that these conclusions are not sensitive to the start year of the survey (Figure 17-Figure 18).

North Carolina p135 (Juvenile; Spring)

Descriptive statistics for this survey ARIMA are provided in Table 11. The fitted index started at the time series low value, increased through 2013, and has since oscillated (Figure 13-Figure 15). The Mann-Kendall test detected a significant (α = 0.05) increasing trend in the time series. The terminal year index is credibly above the 25th percentile of the time series and the fitted index value in 1998 (Table 12). The retrospective analysis suggests that these conclusions are not sensitive to the start year of the survey (Figure 17-Figure 18).

North Carolina p135 (YOY and Juvenile; Fall)

Descriptive statistics for this survey ARIMA are provided in Table 11. The fitted index declined over the first several years of the survey before generally increasing over time, ending at a time series high value (Figure 13-Figure 15). The Mann-Kendall test detected a significant (α = 0.05) increasing trend in the time series. The terminal year index is credibly above the 25th percentile of the time series and the fitted index value in 1998 (Table 12). The retrospective analysis suggests that these conclusions are not sensitive to the start year of the survey (Figure 17-Figure 18).

North Carolina p135 (YOY; Fall)

Descriptive statistics for this survey ARIMA are provided in Table 11. The fitted index started at the time series high value, declined dramatically through 1993 before generally increasing over the remainder of the time series (Figure 13-Figure 15). The Mann-Kendall test detected a significant (α = 0.05) increasing trend in the time series. The terminal year index is credibly above the 25th percentile of the timeseries and the fitted index value in 1998 (Table 12). The retrospective analysis suggests that these conclusions are not sensitive to the start year of the survey (Figure 17-Figure 18).

North Carolina p135 (Juvenile; Fall)

Descriptive statistics for this survey ARIMA are provided in Table 11. The fitted index started near the time series low value, but generally increased over time, ending at a time series high value (Figure 13-Figure 15). The Mann-Kendall test detected a significant (α = 0.05) increasing trend in the time series. The terminal year index is credibly above the 25th percentile of the time series and the fitted index value in 1998 (Table 12). The retrospective analysis suggests that these conclusions are not sensitive to the start year of the survey (Figure 17-Figure 18).

USFWS

Descriptive statistics for this survey ARIMA are provided in Table 11. No additional years of data are available since ASMFC (2017), and so the results are identical to those reported there. In short, the fitted index started at the time series high value, decreased through 2006 before generally increasing over the remainder of the time series (Figure 13-Figure 15). The Mann-Kendall test did not detect a significant (α = 0.05) trend in the time series. The terminal year index is credibly above the 25th percentile of the timeseries but not the fitted index value in 1998 (Table 12). The retrospective analysis suggests that conclusions regarding comparisons between terminal year and 1998 are sensitive to the start year of the survey, but not against the 25th percentile of the time series (Figure 17-Figure 18).

South Atlantic DPS

SC Edisto

Descriptive statistics for this survey ARIMA are provided in Table 11. The fitted index started at the time series high value, decreased through 2008 before increasing through 2020; the index has since declined slightly (Figure 13-Figure 15). The Mann-Kendall test detected a significant (α = 0.05) increasing trend in the time series. The terminal year index is credibly above the 25th percentile of the time series but not the fitted index value from the start of the survey (Table 12). The retrospective analysis suggests that conclusions regarding comparisons between terminal year and start year are sensitive to the start year of the survey, but not against the 25th percentile of the time series (Figure 17-Figure 18).

NYB-CB-C DPSs

NEAMAP

Descriptive statistics for this survey ARIMA are provided in Table 11. The fitted index oscillated over the first decade of the time series and has been increasing since, ending at a time series high value (Figure 13-Figure 15). The Mann-Kendall test did not detect a significant (α = 0.05) trend in the time series. The terminal year index is credibly above the 25th percentile of the time series and the fitted index value from the start of the survey (Table 12). The retrospective analysis suggests that these conclusions are not sensitive to the start year of the survey (Figure 17-Figure 18).

Coastwide (All DPSs)

Conn Index

Descriptive statistics for this survey ARIMA are provided in Table 11. The fitted index declined over the first several years before increasing through 2005; the index declined slightly for several years afterwards, before increasing to a time series high in 2021, and declined slightly in 2022 (Figure 13-Figure 15). The Mann-Kendall test detected a significant (α = 0.05) increasing trend in the time series. The terminal year index is credibly above the 25th percentile of the time series and the fitted index value from the start of the survey (Table 12). The retrospective analysis suggests that these conclusions are not sensitive to the start year of this index (Figure 17-Figure 18).

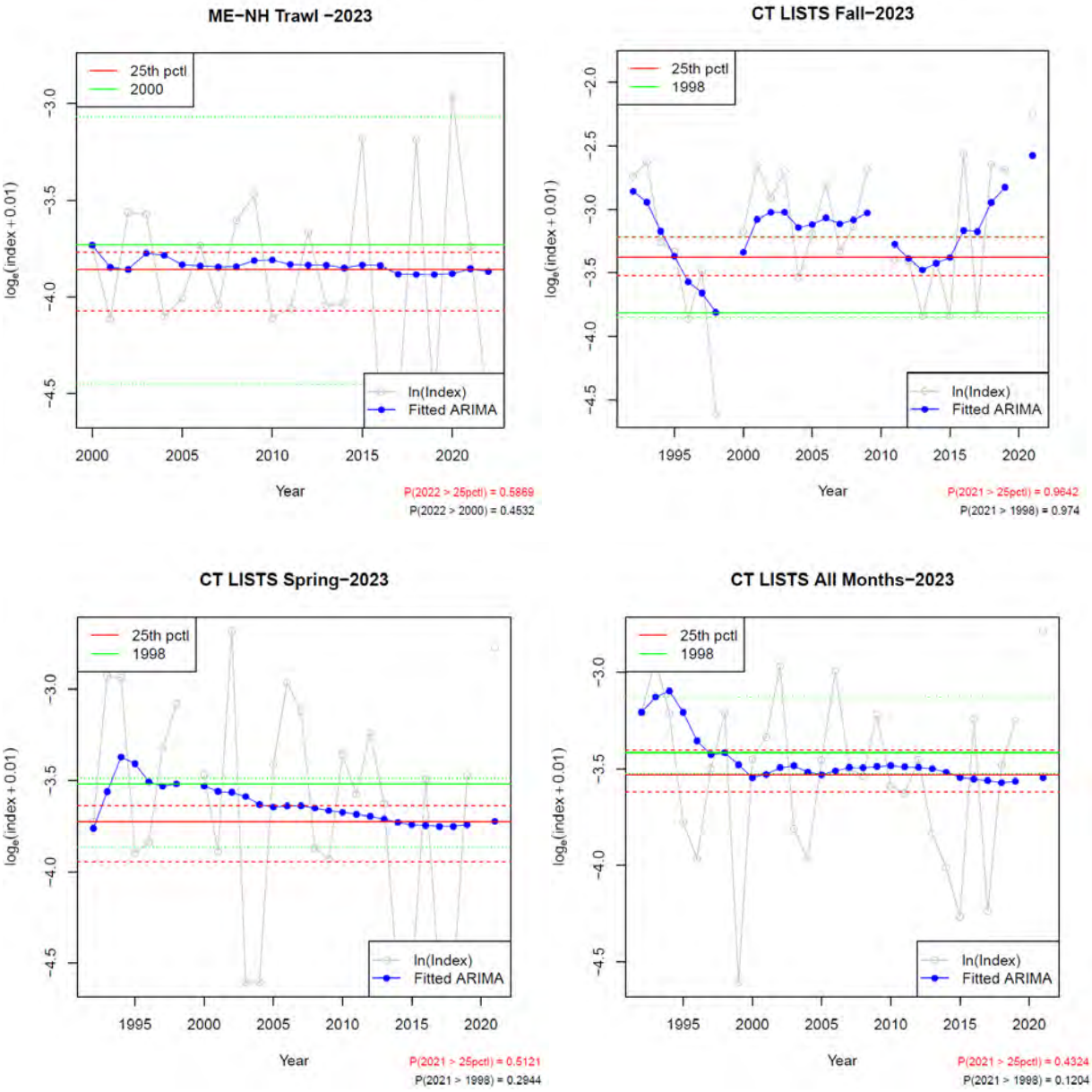


Figure A1. ARIMA-fitted indices used to establish stock status (solid blue line) plotted with the reference values. The dashed red and green lines represent the 80% confidence intervals around the reference values. The grey line with circles is the raw index input to ARIMA. Probability of exceeding reference points is provided in bottom-right margin of plots. Figures continue on the following pages.

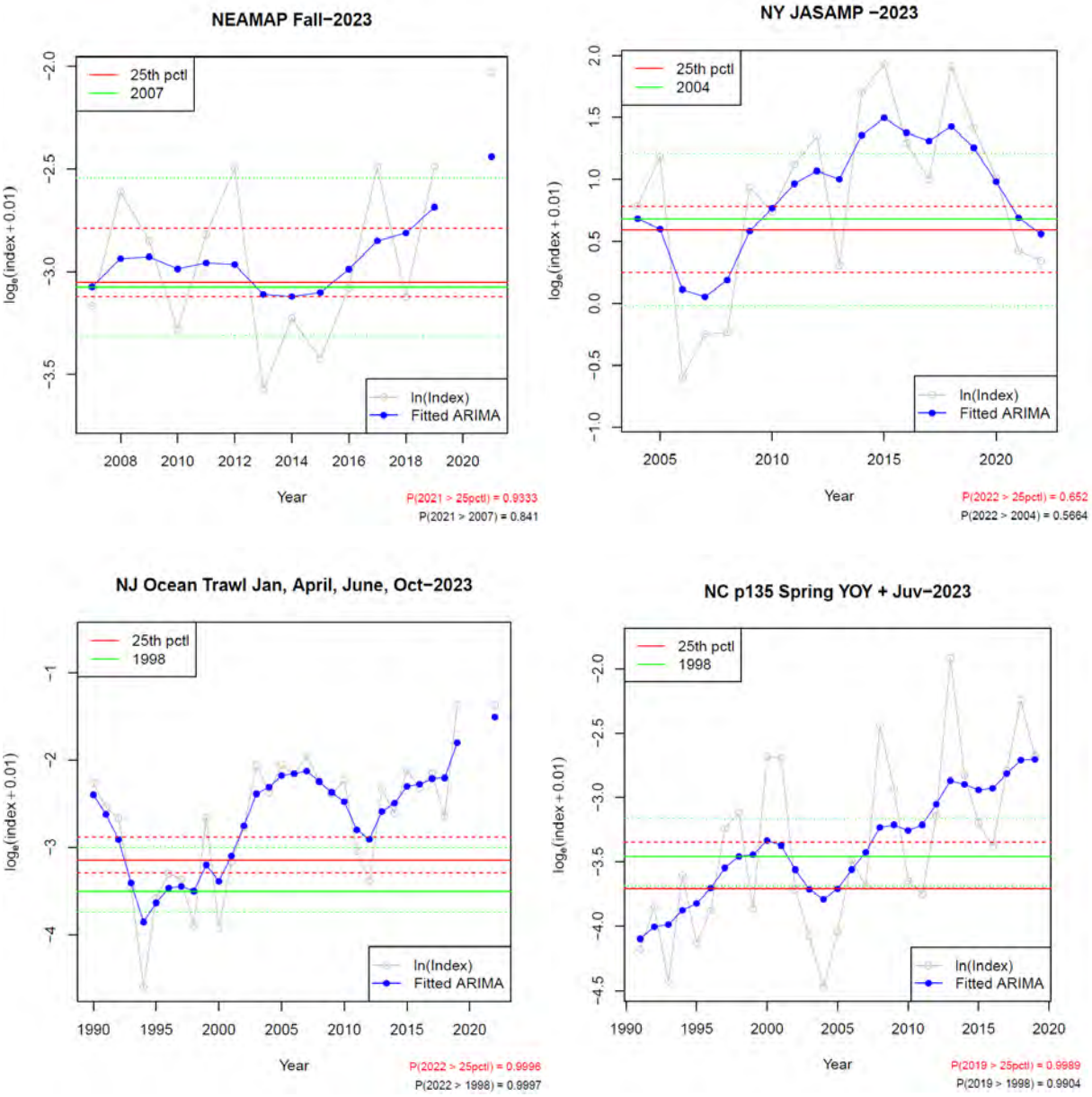


Figure A18 Continued.

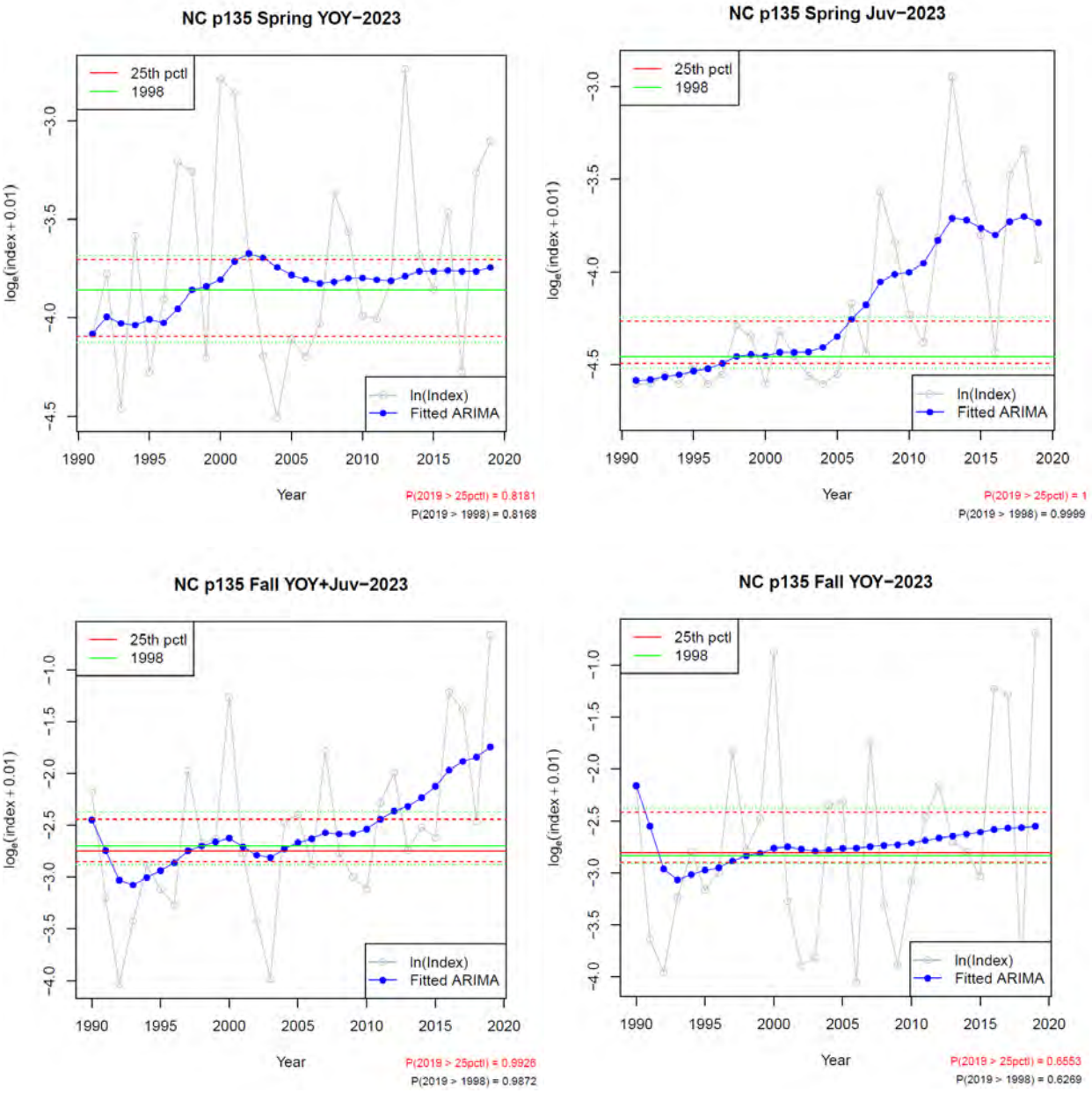
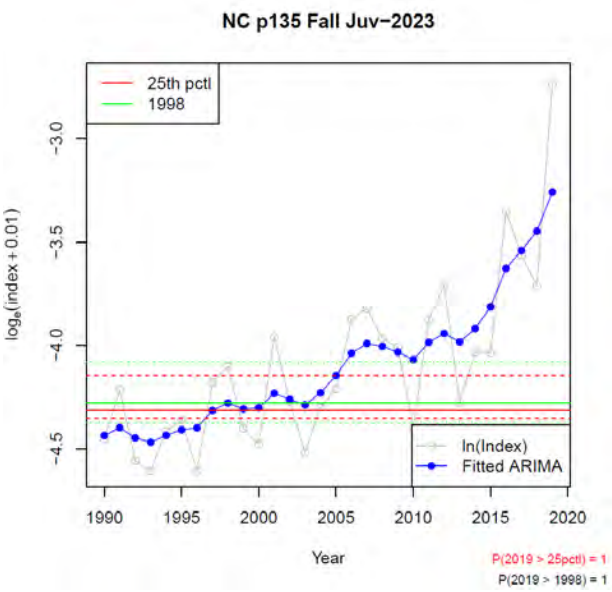
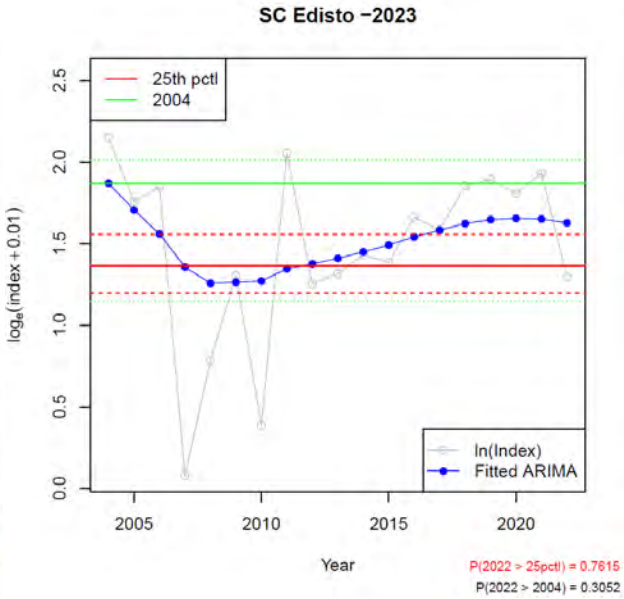


Figure A18 Continued.


NC p135 Fall Juv−2023
25th pctl
1998
ln(Index)
Fitted ARIMA
log$_e$(index + 0.01)
−3.0
−3.5
−4.0
−4.5
1990
1995
2000
2005
2010
2015
2020
Year
P(2019 > 25pctl) = 1
P(2019 > 1998) = 1


SC Edisto −2023
25th pctl
2004
ln(Index)
Fitted ARIMA
log$_e$(index + 0.01)
2.5
2.0
1.5
1.0
0.5
0.0
2005
2010
2015
2020
Year
P(2022 > 25pctl) = 0.7615
P(2022 > 2004) = 0.3052

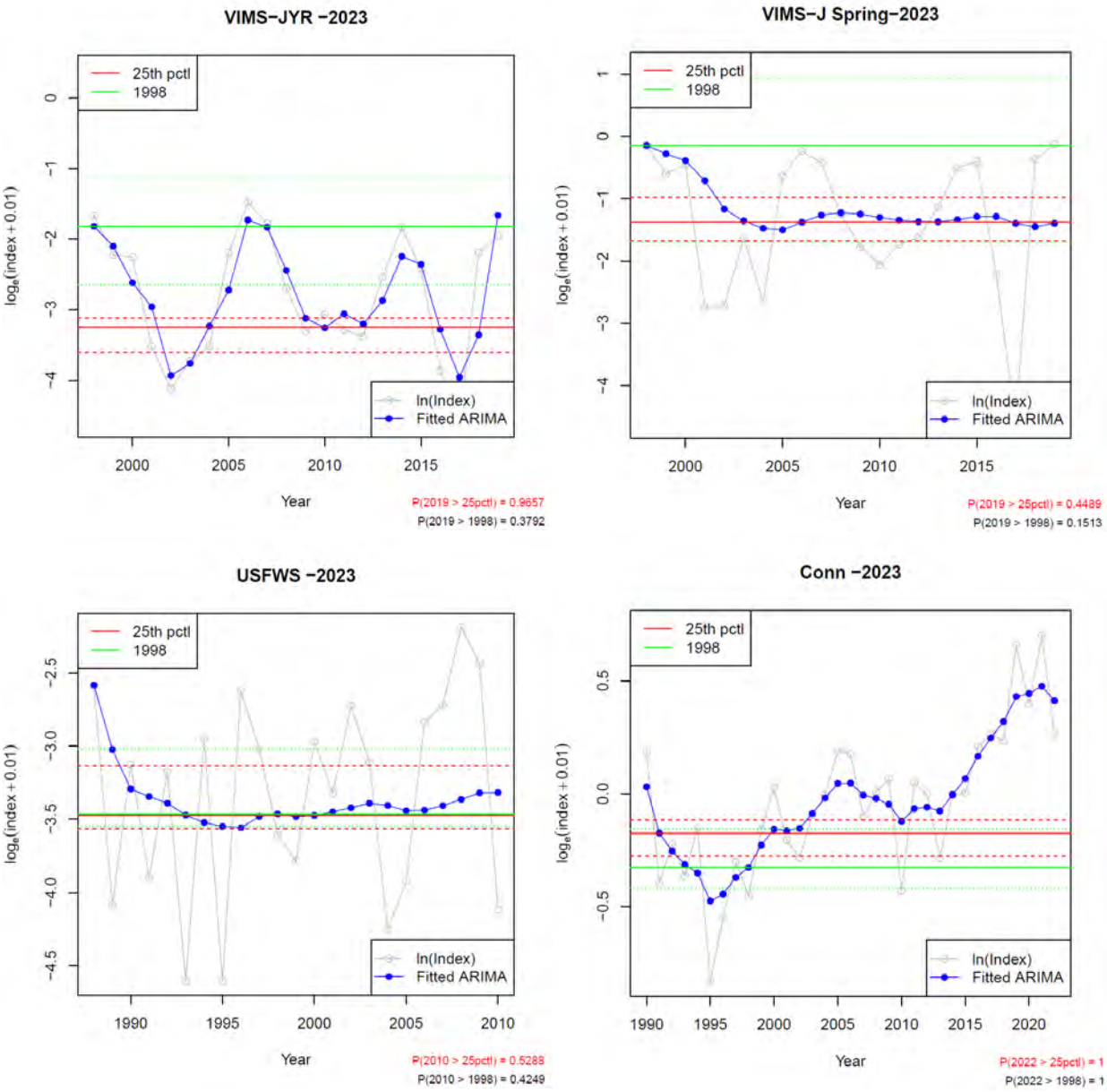


Figure A18 Continued.

d. 2017 Benchmark Research Recommendations

The following is the complete list of research recommendations from the benchmark assessment (ASMFC 2017).

Research recommendations have been categorized as future research, data collection, and assessment methodology and ranked as high or moderate priority. Recommendations with asterisks (**) indicate improvements that should be made before initiating another benchmark stock assessment.

Future Research

High Priority

Identify spawning units along the Atlantic coast at the river or tributary and coast-wide level.

**Expand and improve the genetic stock definitions of Atlantic sturgeon, including developing an updated genetic baseline sample collection at the coast-wide, DPS, and river-specific level for Atlantic sturgeon, with the consideration of spawning season-specific data collection.

Determine habitat use by life history stage including adult staging, spawning, and early juvenile residency.

Expand the understanding of migratory ingress of spawning adults and egress of adults and juveniles along the coast.

Identify Atlantic sturgeon spawning habit through the collection of eggs or larvae.

Investigate the influence of warming water temperatures on Atlantic sturgeon, including the effects on movement, spawning, and survival.

Moderate Priority

Evaluate the effects of predation on Atlantic sturgeon by invasive species (e.g., blue and flathead catfish).

Data Collection

High Priority

**Establish regional (river or DPS-specific) fishery-independent surveys to monitor Atlantic sturgeon abundance or expand existing regional surveys to include annual Atlantic sturgeon monitoring. Estimates of abundance should be for both spawning adults and early juveniles at age. See Table 8 in ASMFC 2017 for a list of surveys considered by the SAS.

**Establish coast-wide fishery-independent surveys to monitor Atlantic sturgeon mixed stock abundance or expand existing surveys to include annual Atlantic sturgeon monitoring. See Table 8 in ASMFC 2017 for a list of surveys considered by the SAS.

**Continue to collect biological data, PIT tag information, and genetic samples from Atlantic sturgeon encountered on surveys that require it (e.g., NEAMAP). Consider including this level of data collection from surveys that do not require it.

**Encourage data sharing of acoustic tagged fish, particularly in underrepresented DPSs, and support programs that provide a data sharing platform such as The Atlantic Cooperative Telemetry Network. Data sharing would be accelerated if it was required or encouraged by funding agencies.

**Maintain and support current networks of acoustic receivers and acoustic tagging programs to improve the estimates of total mortality. Expand these programs in underrepresented DPSs.

**Collect DPS-specific age, growth, fecundity, and maturity information.

**Collect more information on regional vessel strike occurrences, including mortality estimates. Identify hot spots for vessel strikes and develop strategies to minimize impacts on Atlantic sturgeon.

**Monitor bycatch and bycatch mortality at the coast-wide level, including international fisheries where appropriate (i.e., the Canadian weir fishery). Include data on fish size, health condition at capture, and number of fish captured.

Assessment Methodology

High Priority

**Establish recovery goals for Atlantic sturgeon to measure progress of and improvement in the population since the moratorium and ESA listing.

**Expand the acoustic tagging model to obtain abundance estimates and incorporate movement.

Moderate Priority

Evaluate methods of imputation to extend time series with missing values. ARIMA models were applied only to the contiguous years of surveys due to the sensitivity of model results to missing years observed during exploratory analyses.

Atlantic States Marine Fisheries Commission

Sciaenids Management Board

August 7, 2024
11:30 a.m. – 12:30 p.m.

Draft Agenda

The times listed are approximate; the order in which these items will be taken is subject to change; other items may be added as necessary.

1.	Welcome/Call to Order *(D. Haymans)*	11:30 a.m.
2.	Board Consent • Approval of Agenda • Approval of Proceedings from April 2024	11:30 a.m.
3.	Public Comment	11:35 a.m.
4.	Review 2024 Traffic Light Analyses for Spot and Atlantic Croaker *(D. Franco/H. Rickabaugh)* **Possible Action** • Technical Committee Recommendations	11:45 a.m.
5.	Consider Red Drum and Atlantic Croaker Fishery Management Plan Reviews and State Compliance for the 2023 Fishing Year (*T. Bauer*) **Action**	12:15 p.m.
6.	Progress Update on Red Drum, Atlantic Croaker, and Spot Benchmark Stock Assessments (*J. Kipp*)	12:25 p.m.
7.	Other Business/Adjourn	12:30 p.m.

The meeting will be held at The Westin Crystal City (1800 Richmond Highway, Arlington, VA; 703.486.1111) and via webinar; click here for details

MEETING OVERVIEW

Sciaenids Management Board
August 7, 2024
11:30 a.m. – 12:30 p.m.

Chair: Doug Haymans (GA) Assumed Chairmanship: 02/24	Technical Committee Chairs: Black Drum: Harry Rickabaugh (MD) Atlantic Croaker: Vacant Red Drum: Ethan Simpson (VA) Spot: Harry Rickabaugh (MD)	Law Enforcement Committee Representative: Col. Matthew Rogers (VA)
Vice Chair: Shanna Madsen	Advisory Panel Chair: Craig Freeman (VA)	Previous Board Meeting: April 30, 2024
Voting Members: NJ, DE, MD, PRFC, VA, NC, SC, GA, FL, NMFS (10 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from April 2024

3. Public Comment – At the beginning of the meeting public comment will be taken on items not on the agenda. Individuals that wish to speak at this time must sign-in at the beginning of the meeting. For agenda items that have already gone out for public hearing and/or have had a public comment period that has closed, the Board Chair may determine that additional public comment will not provide additional information. In this circumstance the Chair will not allow additional public comment on an issue. For agenda items that the public has not had a chance to provide input, the Board Chair may allow limited opportunity for comment. The Board Chair has the discretion to limit the number of speakers and/or the length of each comment.

4. Review 2024 Traffic Light Analyses for Spot and Atlantic Croaker (11:45 a.m.-12:15 p.m.) Possible Action

Background

- The Traffic Light Analyses (TLAs) are updated annually for both spot and Atlantic croaker to assess changes to the population in non-benchmark stock assessment years.
- The 2020 TLA triggered management action at the level of moderate concern. Addendum III states management measures set in response to any trigger must remain in place for at least two years for spot (2021-2022) and three years for Atlantic croaker (2021-2023).
- Missing survey data which prevented re-evaluation of management measures for both species in previous years is now available. In April 2024, the Sciaenids Management Board directed the Spot and Atlantic Croaker TCs to conduct abbreviated TLAs with data through 2023 for both species, focusing on updating only the harvest and abundance composite metrics used to make management decisions, and not the supplemental information which has been provided in the past.
- The Spot and Atlantic Croaker TCs met in June to discuss the results of the 2024 TLAs and make recommendations on how to proceed with management for these two species. The Spot and Croaker TCs recommended maintaining current management measures for both species (**Briefing Materials**).

Presentations

- Review of 2024 Traffic Light Analyses of the 2023 fishing year for Atlantic Croaker and Spot by D. Franco and H. Rickabaugh.

Board actions for consideration at this meeting

- Consider Spot Addendum III management measures.
- Consider Atlantic Croaker Addendum III management measures.

5. Consider Red Drum and Atlantic Croaker Fishery Management Plan Reviews and State Compliance for the 2023 Fishing Year (12:15-12:25 p.m.)

Background

- Red Drum state compliance reports are due on July 1. The Red Drum Plan Review Team (PRT) has reviewed state reports and compiled the annual FMP Review. New Jersey and Delaware have requested continued *de minimis* status (**Briefing Materials**).
- Atlantic Croaker state compliance reports are due on July 1. The Atlantic Croaker Plan Review Team (PRT) has reviewed state reports and compiled the annual FMP Review. New Jersey has requested *de minimis* status for both their recreational and commercial fisheries, and Delaware, South Carolina, and Georgia requested *de minimis* status for their commercial fisheries (**Briefing Materials**).

Presentations

- FMP Reviews for Red Drum and Atlantic Croaker by T. Bauer.

Board actions for consideration at this meeting

- Consider approval of the 2023 FMP Review, state compliance reports, and New Jersey and Delaware *de minimis* requests for Red Drum.
- Consider approval of the 2023 FMP Review, state compliance reports, and New Jersey, Delaware, South Carolina, and Georgia *de minimis* requests for Atlantic Croaker.

6. Progress Update on Red Drum, Atlantic Croaker, and Spot Benchmark Stock Assessments (12:25-12:30 p.m.)

Background

- Work on the red drum benchmark stock assessment was initiated in late 2022/early 2023. In-person Assessment Workshops were held November 6-9, 2023 and March 11-14, 2024. The SouthEast Data and Assessment Review (SEDAR) Review Workshop will be held August 13-16, 2024 in Charleston, SC. The assessment and peer review report are expected to be presented to the Board at their October 2024 meeting.
- Work on the Atlantic croaker and spot benchmark stock assessments was initiated in early 2023. At their October 2023 meeting, the Policy Board agreed to decouple the spot and Atlantic croaker stock assessments due to the loss of a lead modeler, and move forward with the Atlantic croaker stock assessment to be completed first. Work on the spot stock assessment will resume once the Atlantic croaker assessment is completed and peer-reviewed. A sub-group of the Stock Assessment Subcommittee is meeting biweekly to discuss Atlantic croaker modeling progress.

Presentations

- Stock assessment update by J. Kipp.

7. Other Business/Adjourn

Sciaenids Management Board

Activity level: High

Committee Overlap Score: Moderate (American Eel TC, Cobia TC, Horseshoe Crab TC, Weakfish TC)

Committee Task List

- Red Drum SAS – Conduct Red Drum Benchmark Assessment
- Atlantic Croaker and Spot SAS – Conduct Atlantic Croaker and Spot Benchmark Assessments
- Black Drum TC – Update annual indicators
- Red Drum TC – Assist with the Red Drum Benchmark Assessment
- Atlantic Croaker TC – Gather data and assist with Atlantic Croaker Benchmark Assessment; Conduct Traffic Light Analysis
- Spot TC – Gather data and assist with Spot Benchmark Assessment; Conduct Traffic Light Analysis
- Atlantic Croaker TC/PRT – July 1: Compliance Reports Due
- Red Drum TC/PRT – July 1: Compliance Reports Due
- Black Drum TC/PRT – August 1: Compliance Reports Due
- Spotted Seatrout PRT – September 1: Compliance Reports Due
- Spot TC/PRT – November 1: Compliance Reports Due

TC Members:

Atlantic Croaker: Kristen Anstead (ASMFC), Tracey Bauer (ASMFC), Stacy VanMorter (NJ), Devon Scott (DE), Harry Rickabaugh (MD), Ingrid Braun (PRFC), Willow Patten (NC), Margaret Finch (SC), Dawn Franco (GA), Halie OFarrell (FL)

Black Drum: Harry Rickabaugh (MD, Chair), Jeff Kipp (ASMFC), Tracey Bauer (ASMFC), Jennifer Pyle (NJ), Jordan Zimmerman (DE), Ethan Simpson (VA), Chris Stewart (NC), Chris McDonough (SC), Ryan Harrell (GA), Rebecca Scott (FL)

Red Drum: Ethan Simpson (VA, Chair), Jeff Kipp (ASMFC), Tracey Bauer (ASMFC), Alissa Wilson (NJ), Matthew Jargowsky (MD), Cara Kowalchyk (NC, Vice-Chair), Joey Ballenger (SC), Chris Kalinowsky (GA), Sarah Burnsed (FL)

Spot**:** Harry Rickabaugh (MD, Chair), Jeff Kipp (ASMFC), Tracey Bauer (ASMFC), Stacy VanMorter (NJ), Devon Scott (DE), Ingrid Braun (PRFC), Willow Patten (NC), Michelle Willis (SC), Britney Hall (GA), Halie OFarrell (FL)

Plan Review Team Members:

Atlantic Croaker: Harry Rickabaugh (MD), Ingrid Braun (PRFC), Ethan Simpson (VA), Willow Patten (NC), Chris McDonough (SC), Tracey Bauer (ASMFC)

Black Drum: Jordan Zimmerman (DE), Chris Stewart (NC), Chris McDonough (SC), Tracey Bauer (ASMFC)

Red Drum: Matthew Jargowsky (MD), Ethan Simpson (VA), Cara Kowalchyk (NC), Joey Ballenger (SC), Matt Kenworthy (FL), Tracey Bauer (ASMFC)

Spot**:** Harry Rickabaugh (MD), Ethan Simpson (VA), Chris McDonough (SC), Dawn Franco (GA), Tracey Bauer (ASMFC)

Spotted Seatrout**:** Tracey Bauer (ASMFC), Samantha MacQuesten (NJ), Lucas Pensinger (NC), Brad Floyd (SC), Chris Kalinowsky (GA)

SAS Members:

Red Drum: Joey Ballenger (SC, Chair), Jeff Kipp (ASMFC), Tracey Bauer (ASMFC), Angela Giuliano (MD), CJ Schlick (SC), Jared Flowers (GA), Chris Swanson (FL), Ethan Simpson (VA)

Atlantic Croaker and Spot: Kristen Anstead (ASMFC), Jeff Kipp (ASMFC), Tracey Bauer (ASMFC), Harry Rickabaugh (MD), Brooke Lowman (VA), Trey Mace (MD), Margaret Finch (SC)

DRAFT PROCEEDINGS OF THE

ATLANTIC STATES MARINE FISHERIES COMMISSION

SCIAENIDS MANAGEMENT BOARD

The Westin Crystal City
Alington, Virginia
Hybrid Meeting

April 30, 2024

TABLE OF CONTENTS

INDEX OF MOTIONS

ATTENDANCE

Board Members

Joe Cimino, NJ (AA)
Jeff Kaelin, NJ (GA)
John Clark, DE (AA)
Roy Miller, DE (GA)
Craig Pugh, DE, proxy for Rep. Carson (LA)
Carrie Kennedy, MD, proxy for L. Fegley (AA)
Shanna Madsen, VA, proxy for J. Green (AA)
Chris Batsavage, NC, proxy for K. Rawls (AA)
Chad Thomas, NC, proxy for Rep. Wray (LA)
Chris McDonough, SC, proxy for M. Rhodes (GA)
Ben Dyar, SC, proxy for Sen. Cromer (LA)
Doug Haymans, GA (AA)
Spud Woodward, GA (GA)
Jeffery Ranchen, FL, proxy for J. McCawley (AA)
Gary Jennings, FL (GA)
Rep. Thad Altman, FL (LA)
Ron Owens, PRFC

(AA = Administrative Appointee; GA = Governor Appointee; LA = Legislative Appointee)

Ex-Officio Members

Somers Smott, Chair, Atl. Croaker Technical Committee
Harry Rickabaugh, Chair, Black Drum & Spot Technical Committees
Matthew Rogers, Law Enforcement Representative

Staff

Robert Beal
Toni Kerns
Tina Berger
Madeline Musante
Tracey Bauer
Caitlin Starks
James Boyle
Emile Franke
Chelsea Tuohy
Katie Drew
Jeff Kipp
Kristen Anstead
Lindsey Aubert
Trevor Scheffel

Guests

Pat Augustine
Linda Barry, NJ DEP
Mel Bell
Michael Bowen, Cornell Uni.
Delayne Brown, NH FGD
Debbie Campbell
John Carmichael, SAMFC
Nicole Caudell, MD DNR
Haley Clinton, NC DEQ
Scott Curatolo-Wagemann, Cornell Cooperative Extension of Suffolk County
Tanya Darden, SC DNR MRRI
Conor Davis, NJ DEP
Jacob Dorothy, MA DMF
Roman Dudus
Jacob Espittia, FL FWC
Julie Evans, East Hampton Town Fisheries Advisory Cmte.
James Fletcher, Unites National Fisherman's Assn.
Anthony Friedrich, ASGA
Erica Fuller
Keilin Gamboa-Salazar, SC DNR
Marty Gary, NY (AA)
Matthew Gates
Pat Geer, VMRC
Lewis Gillingham, VMRC
Angela Giuliano, MD DNR
Derrek Hughes, NYS DEC
Kris Kuhn
Robert LaCava, MD DNR
Brooke Lowman, VMRC
Michael Luisi, MD DNR
John Maniscalco, NYS DEC
Anthony Mastitski, Marine Stewardship Council
Patrice McCarron, Maine Lobstermen's Assn.
Genine McClair, FL FWC
Jack McGovern, NOAA
Meredith Mendelson, MA DMR
Chris Moore, Chesapeake Bay Foundation
Robert Murphy, NOAA
Thomas Newman, North Carolina Fisheries Assn.
Jeff Nichols, MA DMR

Guests (continued)

Scott Olszewski, RI DEM
Alexis Park, MD DNR
Will Poston, ASGA
Jill Ramsey, VMRC
David Sikorski
Renee St. Amand, CT DEEP
Kristen Thiebault, MA DMF
Laura Tomlinson, MA DMF
Craig Weedon, MD DNR
Angel Willey, MD DNR
Travis Williams, NC DEQ
Gregory Wojcik, CT DEEP
Chris Wright, NOAA
Daniel Zapf, NC DEQ

The Sciaenids Management Board of the Atlantic States Marine Fisheries Commission convened in the Jefferson Ballroom of the Westin Crystal City Hotel, Arlington, Virginia, a hybrid meeting, in-person and webinar; Tuesday, April 30, 2024, and was called to order at 11:45 a.m. by Chair Doug Haymans.

CALL TO ORDER

CHAIR DOUG HAYMANS: Good morning, everyone, I've got 11:45, and in the interest of lunch, we'll get started with the Sciaenids Management Board. If I could ask the folks on this side, my right, to turn your name tags this way, because there are two in the middle that I don't know. Perfect, thank you. That would be very helpful, appreciate it.

Welcome to the new era of Doug Hayman's Chairmanship, hopefully it will survive two years, and it all will be good.

APPROVAL OF AGENDA

CHAIR HAYMANS: First of all, we have an agenda in front of you. We have one item to add to Other Business, which will be a very brief discussion on the Traffic Light Approach for Spot, and Tracey will handle that. Are there any other additions to the agenda? Seeing none; we'll approve the agenda.

APPROVAL OF PROCEEDINGS

CHAIR HAYMANS: We have the proceedings from October in front of you. Are there any corrections or additions to that? Seeing none; we'll approve the proceedings.

PUBLIC COMMENT

CHAIR HAYMANS: Next is an opportunity for Public Comment for items that are not listed on the agenda.

Is there anyone in the audience who wish to provide public comment? Seeing none; Tracey, is there any online? There are no online comments, I love it as we move along quickly.

CONSIDER SPOT FISHERY MANAGEMENT PLAN REVIEW AND STATE COMPLIANCE REPORTS FOR THE 2022 FISHING YEAR

CHAIR HAYMANS: From here on out we'll turn it over to Tracey, to talk about the Spot Fishery Management Plan Review and State Compliance Reports.

MS. TRACEY BAUER: Good morning, everyone, I will be covering the Spot Fishery Management Plan Review. As an overview, I will be presenting an abbreviated overview of the Spot FMP today. In this presentation I will start with a brief update of the status of the fishery for Spot, and then we'll go over the de minimis requests received and the most recent compliance reports. Then lastly, review the Plan Review Team's recommendations in the FMP Review.

We will first start off with reviewing the recent trends in total landing of spot. This figure shows commercial and recreational landings in millions of pounds through 2022. The total landings of spot in 2022 were estimated to be 3.9 million pounds, which is a decrease of 45 percent from 2021, and below the 10-year average of 8.3 million pounds.

However, it should be noted that the recreational and commercial regulations for spot implemented in 2021 and 2022 may be a contributing factor for the declines observed in both sectors in 2022. Of the 3.9 million pounds of total landings of Spot harvest in 2022, 1.5 million pounds of that were harvest commercially, and Virginia landed approximately 55 percent of the spot commercial harvest, followed by North Carolina with 26 percent. I also wanted to briefly touch on the recent trends in the recreational fishery specifically. This figure shows recreational harvest in releases in millions of fish, as well as percent of recreational fish that were released.

The recreational harvest has fluctuated wildly throughout the time series, but has generally declined from the most recent peak in 2014, with a near time series low harvest occurring in 2022 at 12.8 million fish. Anglers in Virginia harvested 70

percent of the coastwide number of fish in 2022, followed by anglers in Maryland at 13 percent.

Releases have been increasing annually since the low in 2018. The number of fish released recreationally in 2022 was estimated to be 16.1 million fish a 1.1 million fish increase from 2021, and the percent of fish caught recreationally that were released, which is on the orange line in the graph, released recreationally have generally been increasing throughout the time series, with a time series high in 2022 at 56 percent of the fish caught recreationally that are released.

We will now cover the de minimis requests and the PRT recommendations section of the presentation. As a reminder, as stated in the Omnibus Amendment the spot is managed under, a state qualifies for de minimis status if its past three years average of the combined commercial and recreational catch is less than 1 percent of the past three years average of the coastwide combined catch.

Therefore, spot does not have a separate de minimis for the commercial and recreational fisheries like Atlantic croaker. New Jersey, Georgia and Delaware all requested de minimis for spot. New Jersey and Georgia's three-year average combined recreational and commercial harvest is less than 1 percent of the coastwide total. Delaware, however, did not meet the requirement of less than 1 percent at 1.05 percent, which we will discuss further in a bit.

The PRT recommendations, they found no inconsistencies among states with regards to the requirements of the Omnibus Amendment in Addendum III. As in previous years, the PRT recommends that the Board consider changing the de minimis process and criteria for spot, to put in place separate commercial and recreational de minimis measures similar to Atlantic croaker.

But this would be following the next assessment or when a new management document is initiated, whatever comes first. It would also follow the procedures in the recently approved de minimis policy. A change here would not only mirror Atlantic croaker de minimis structure, but would provide the states more flexibility in managing their commercial and recreational fisheries. Additional research and monitoring recommendations can be found in the FMP review document.

As for Delaware's de minimis request, the PRT did not recommend de minimis status for Delaware. In the previous FMP review, the Plan Review Team had stated that if Delaware was over the de minimis threshold for a third year in a row, which they were this year, they would not recommend de minimis again, as it showed a consistent trend. In the past three years, Delaware has ranged between 1.05 and 1.2 percent of the coastwide harvest of spot. In addition, the PRT noted that Delaware's recreational spot harvest estimate from MRIP in 2023 is over 11 times higher than 2022, so they would likely not qualify for de minimis again in this year's FMP Review. As a reminder, on the screen are the aspects of Delaware's regs that would have to change if Delaware was not granted de minimis again today.

Right now, Delaware has no restrictions specifically on spot recreational or commercial harvest. The non de minimis states are required to implement at this time a 50 fish recreational bag limit and commercial regulations that would have reduced the average 10-year commercial harvest by 1 percent. The action for the Board today is a motion on approval or disapproval of FMP review, state compliance reports and de minimis requests for spot. With that I can take any questions.

CHAIR HAYMANS: Any questions? My thought was to remove Delaware from a motion. Let's get past the FMP review, the state compliance reports and the two easy de minimis, and then let's pass those and then let's have a discussion about what to do with Delaware. If that's okay, I would entertain a motion. Spud.

MR. A. G. "SPUD" WOODWARD: **Move to approve the spot FMP review for the 2022 fishing year, state compliance reports and de minimis status for New Jersey and Georgia**.

CHAIR HAYMANS: Joe Cimino, thank you. Any additional discussion? **Any opposition? Seeing none; thank you**. John, let's talk about Delaware.

MR. CLARK: I will try to make a convincing argument here for Delaware to continue its de minimis status. As reported, we were at 1.05 percent of our total landings. We're still just barely over the de minimis threshold. Our recreational harvest has been below the 1 percent of the coastwide harvest since 2016.

Our exceedance of the 1 percent combined recreational and commercial harvest is due to Delaware's commercial harvest exceeding 1 percent of the coastwide harvest for a majority of the past 10 years, but when you combine the two, I think the reason that we are now over 1 percent more is just because with both commercial and recreational declining, the commercial harvest has become more of a factor when you combine the two.

When you look at that, the interesting thing is that we're still much more similar to the de minimis states than our actual landings, both commercially and recreational than we are to the non de minimis states. I would just think that it would make more sense to keep us in that category, 2023 as pointed out, the initial MRIP estimates show that Delaware had a huge recreational harvest, but it could be an MRIP anomaly, our PSE for 2023 is about 41 percent. There also, you can take that with a bit of a grain of salt.

Then finally, I would just say that on the process side of things with de minimis, we asked, as the report shows, there was talk about splitting the commercial and recreational de minimis criteria. It's also part of the de minimis policy that isn't clear is, in a situation like ours, where we have now broken the de minimis threshold, just barely for three years in a row. If we make these changes and then going forward, we're back below de minimis again, there is really not a clear process for returning to de minimis, you know to remove the regulations that were put in place when we went through this brief period of being above de minimis. For all those reasons I would ask the Board to indulge us and allow us to continue in de minimis for another year. Thank you.

CHAIR HAYMANS: Spud.

MR. WOODWARD: Yes, question, John. Not being familiar with the way that the recreational fishery is prosecuted in Delaware, but I assume that there is a fair amount of shore mode catches of spot in Delaware.

MR. CLARK: That is true Spud. One of the main places that people catch a lot of Spot, is down at our major fishing pier, the Cape Henlopen, right down at the mouth of the Bay.

CHAIR HAYMANS: Spud, is there a follow up?

MR. WOODWARD: Yes, I think obviously with the concerns we've had with the FES study and the pilot study and shore mode being in one of those ones that might be more proportionately affected. I certainly think that adds some context to this. I appreciate it, John.

CHAIR HAYMANS: Chris.

MR. CHRIS BATSAVAGE: John, you mentioned there could be an anomaly in the MRIP estimates. It's two questions, one, did your staff kind of take a deep dive into the MRIP data to see if there are any intercepts that might have been anomalous? Second question is, anecdotally, did it appear that there were higher spot catches in Delaware last year by the recreational fishery?

MR. CLARK: Well, in terms, we haven't done the real deep look at the data yet. Anecdotally, I know just going by the reports that it did sound like it was a good year for recreational spot fishing. Roy, I know you fish a lot of times down in that area. Did you see a lot of Spot?

MR. ROY W. MILLER: Yes, particularly inshore areas spot has been abundant the past couple years, and there is a pretty active sport fishery, at least I'm categorizing the sport fishery for Spot.

CHAIR HAYMANS: Okay, have a little discussion. Is there any desire for a motion to support Delaware? Spud.

MR. WOODWARD: Yes, I'll **move that given the circumstances surrounding this, that Delaware be granted de minimis status per its request**.

CHAIR HAYMANS: Second. John Clark. Any additional discussion? Chris.

MR. BATSAVAGE: I appreciate kind of the administrative burden and the variable landings that Delaware has seen. But I cannot support this, you know this could have been a one-off estimate of spot harvest, but it could also mean that there is more available to Delaware last year, and it could be more with warmer winters and things like that. Kind of when you consider that the spot population at least according to the landings in independent surveys show that they are at a very low level, compared to what we were used to seeing for decades and decades. I don't see the harm in Delaware basically putting in the same recreational and commercial limits that the other non de minimis states do, just as a safeguard measure.

CHAIR HAYMANS: Anyone else? Okay, all those in favor of the motion.

MS. TONI KERNS: Mr. Chair, I don't think we actually read this motion explicitly in the record. Do you mind reading it for us?

CHAIR HAYMANS: The motion is, **move to approve de minimis status for Delaware**. Motion by Mr. Woodward, second by Mr. Clark. **Again, all those in favor. I see 8 in favor, all those opposed, I see 1. Motion carries**. Thank you for good discussion, thank you for moving through that quickly, and hopefully as we get to a new plan amendment, we can begin to discuss separating commercial and recreational, as it probably should be.

PROGRESS UPDATE ON RED DRUM, ATLANTIC CROAKER, AND SPOT BENCHMARK STOCK ASSESSMENTS

CHAIR HAYMANS: Next, we'll have a Progress Report from Jeff Kipp about Red Drum, Croaker, and Spot Benchmark Assessment.

MR. JEFF J. KIPP: I'll go ahead and jump right in to updates on a couple sciaenid species, starting off with red drum. The red drum assessment, we have had three workshops to date for this assessment. We had a data workshop over three days back in last year, June of last year, that was a virtual workshop. We had an assessment workshop in person in Charleston in November of last year. One note from that, we did make an additional data request for eight additional months of data, covering January through August of 2023, and this stems from the Technical Committee's decision to change the year definition in the assessment model from a calendar year of January through December to a fishing year of September through August.

With that change we were short on a 2022 terminal year for data. We did get most data for that additional period, but the TC did decide that the 2022 fishing year should not be used for status determination, due to some preliminary data and some incomplete data. We do have complete and final data for the 2021 fishing year, and so that was chosen as the terminal year for the assessment.

We also had a second assessment workshop just recently last month, also in Charleston, in person, that was March 11 through the 14th. There we did review and consider a number of analyses, including some stock synthesis models, the traffic light analyses that were initially developed during the simulation assessment, and some index-based methods.

The SAS does have one final meeting that is going to be a virtual meeting on May 16th, to finalize our stock status determinations, and research recommendations. I do just want to note that there is a potential for advice from different analyses by stock coming from this assessment. Looking forward, our remaining items for the timeline for the red drum assessment.

The SAS will be finalizing the assessment report in early June. That assessment report will be reviewed by the Technical Committee in late June. We'll then send off the report once it's been approved by the Technical Committee to SEDAR for the SEDAR Peer

Review Panel by the first of July, and we are scheduling the SEDAR Peer Review Workshop for the week of August 12, down in Charleston, South Carolina. We'll be presenting that assessment and peer review to this Board at the annual meeting in October of this year.

Moving over to the Atlantic croaker and Spot assessments. These were originally packaged together to go through an assessment together. We had a data workshop; it was a virtual workshop in May of last year. We also had a methods workshop that was virtual as well, back in September. During that timeframe we did run into some personnel challenges.

The lead analyst for the Atlantic croaker assessment changed positions and can no longer serve in that role, so the Spot lead analyst transitioned to that vacant role to take over. This created some challenges with workload. We did come to this Board at our annual meeting last year and proposed decoupling the Atlantic croaker and Spot assessments, to focus on the Atlantic croaker assessment first, and then jump into the Spot assessment once the Atlantic croaker assessment is completed. That was approved by the Board at the annual meeting.

For the Atlantic croaker assessment, we have been having biweekly modeler calls to develop the stock synthesis model for Atlantic croaker. The following items here for the timeline are in gray, and italics, and that is because these dates are likely to change. Our plan for the assessment workshop, which will be our last workshop for this assessment, is to hold off on planning that, until we feel like we've seen enough progress and development in the stock-synthesis model during these biweekly modeler calls, to have a productive assessment workshop.

Right now, it is looking like at least another month or two before we start planning for that final assessment workshop as a part of the Atlantic croaker assessment. The Peer Review Workshop was tentatively scheduled for July/August of this year, but that is likely to be postponed to a later month. Then we were tentatively scheduled to present the Atlantic croaker assessment and peer review to this Board at the annual meeting of this year, but that is likely to be postponed as well.

Right now, we're thinking probably one meeting cycle, so possibly the winter meeting of 2025. Then the plan is, once that Atlantic croaker assessment is finalized and peer reviewed and presented to the Board, the Stock Assessment Subcommittee will then pick up with the Spot assessment, and the plan is to finish that assessment one year from when it is started after the Atlantic croaker assessment. That is it for my updates on those stock assessments, and I can take any questions.

CHAIR HAYMANS: Looks like we're going to need more time on the annual meeting agenda. Any questions for Jeff? Excellent, seeing none; thank you, Jeff, thank you very much. I'm going to skip past the Item 6, move down to Other Business to talk about TLA, and then we'll come back to the final agenda item. Tracey.

MS. BAUER: We just wanted to touch base with the Board and get some direction about the traffic light analyses this year for both Spot and Croaker, and just get some confirmation whether to conduct both for the two species. It's been a while since we've conducted the compete traffic light analyses for both species, and I think we do have the ChesMMAP data now. Again, we just wanted to touch base with the Board and find out from you all whether or not we should start getting the data together, because that will take a bit to conduct these analyses this year. Thank you.

CHAIR HAYMANS: Any advice, direction? Shanna.

MS. SHANNA MADSEN: I do think that it is important at this point for us to start looking at the TLAs again. I know that we kind of put that on hold while we were going through the stock assessments, but I also know that SS3 is giving you some trouble on croaker. I would like to see the TLAs. One thing that I would recommend is shortening that document quite a bit.

I don't want to put too much burden on staff, considering that they're all so in the midst of stock

assessments for these species. I think that the actual indices, the composite indices that we use to make management decisions are sufficient. There is a lot of other stuff in that document that is like great as an addendum to it, but I really don't think that it is necessary for making management decisions. Just trying to lighten the load a little bit there.

CHAIR HAYMANS: Anyone else? Do you need anything else, Tracey? I'm sorry, yes, Carrie.

MS. CARRIE SELBERG: I agree with Shanna. I think whatever we can do to lighten the load, I fully support that. But I also think it's really important, given that Spot, their life span is only three years, and we haven't seen them in a while. We've seen a stock wide assessment in a while, so I think it would be really good to take a look at those this fall.

CHAIR HAYMANS: Anyone else? Okay, we're good on that.

ELECT VICE-CHAIR

CHAIR HAYMANS: That gets us to our last agenda item, and that is the election of a Vice-Chair. Oh, look, John Clark.

MR. CLARK: It is my pleasure to **nominate our esteemed colleague from the Commonwealth of Virginia, Ms. Shana Madsen**.

CHAIR HAYMANS: Excellent, is there a second? Chris Batsavage. Any discussion? Do we need to talk about cobia before we make this vote? No, okay. **Is there any opposition? Seeing none; congratulations**, thank you for your willingness volunteering and all that good stuff.

ADJOURNMENT

CHAIR HAYMANS: I think that concludes the business of this Committee, thank you.

(Whereupon the meeting adjourned at 12:10 p.m. on Tuesday, April 30, 2024.)

Atlantic States Marine Fisheries Commission

1050 N. Highland Street • Suite 200A-N • Arlington, VA 22201
703.842.0740 • 703.842.0741 (fax) • www.asmfc.org

MEMORANDUM

TO: **Sciaenids Management Board**

FROM: **Tracey Bauer, FMP Coordinator**

DATE: **July 22, 2024**

SUBJECT: **Discussion of the 2023 Fishing Year Traffic Light Analysis of Spot and Atlantic Croaker**

Technical Committee Members in Attendance: Somers Smott (Atlantic Croaker Chair, VA), Harry Rickabaugh (Spot Chair, MD), Dawn Franco (GA), Stacy VanMorter (NJ), Ingrid Braun-Ricks (PRFC), Willow Patton (NC), Halie O'Farrell (FL), Margaret Finch (SC), Devon Scott (DE)

Staff in Attendance: Tracey Bauer, Jeff Kipp, Kristen Anstead

Others in Attendance: Ethan Simpson (VA), Chris Batsavage (NC), Brooke Lowman (VA), CJ Schlick (SC), Danny Bryant (GA), Chris McDonough (SC)

This memorandum serves as a summary of the joint Spot and Atlantic Croaker Technical Committees (TCs) call on June 27, 2024. The following outlines the TCs' discussions and recommendations for the Board regarding the Traffic Light Analysis (TLA) for both species.

Background

Annually, the TC conducts a TLA to evaluate a Mid-Atlantic (NJ-VA) and South Atlantic (NC-FL) harvest metric, combining commercial and recreational landings in each region. The TC also evaluates a Mid-Atlantic and South Atlantic abundance metric, combining indices of abundance from fishery-independent surveys in each region. Metrics are evaluated using a color proportion of green, yellow, or red based on comparing that year to a 2002-2012 reference period. Addendum III for each species defined 30% red as a moderate concern and 60% red as a significant concern to the fishery. Management action is triggered according to the 30% red and 60% red thresholds if both the adult abundance and harvest thresholds from a region are exceeded in a set number of terminal years.

The TLA for the 2019 fishing year indicated that both species triggered at the 30% red threshold. State implementation plans for management measures were approved in early 2021 and all new management measures were enacted by the end of 2021. These management measures were to remain in place for at least two years for spot and three years for Atlantic croaker to promote consistent measures and allow for sufficient time to evaluate population response, as per Addendum III. Addendum III for both species also stipulates that while

triggered measures are in effect, only the abundance metrics can be used to evaluate the stock in future updates to the TLA.

In April 2024, the Sciaenids Management Board directed the Spot and Atlantic Croaker TCs to conduct abbreviated TLAs with data through 2023 for both species, focusing on updating only the harvest and abundance composite metrics used to make management decisions, and not the supplemental information which has been provided in the past.

Results of the 2023 FY TLA Update and Recommendations

Spot

Abundance metrics for spot for both regions did not trigger at either threshold in the current update to the TLA. Addendum III states for spot that after two years, if abundance metrics do not exceed either threshold, triggered measures are no longer required and the TC can resume using the harvest metrics to trigger management action.

Although triggered measures are no longer required because abundance characteristics in the spot TLA did not trigger at either threshold, the Spot TC recommends maintaining the current management measures. The TC recognized that if they were to resume using the harvest metrics next year, the TLA could potentially immediately trigger again, requiring the same management action. In addition, there is continued concern with the low spot commercial and recreational harvest, so the TC does not recommend lifting the harvest restrictions at this time.

Atlantic Croaker

For Atlantic croaker, the abundance metric for the Mid-Atlantic region exceeded the 30% threshold in all four terminal years. Addendum III states, in this case, if triggered measures have remained in place for at least four years due to either region's abundance metric exceeding the threshold, the TC must evaluate trends in the stock's abundance to recommend to the Board whether triggered measures should remain in place or more restrictive measures should be considered.

The Atlantic Croaker TC recommends maintaining the current management measures. The TC did not want to recommend more restrictive measures while the Atlantic croaker benchmark stock assessment is currently ongoing and will be completed approximately within the next year.

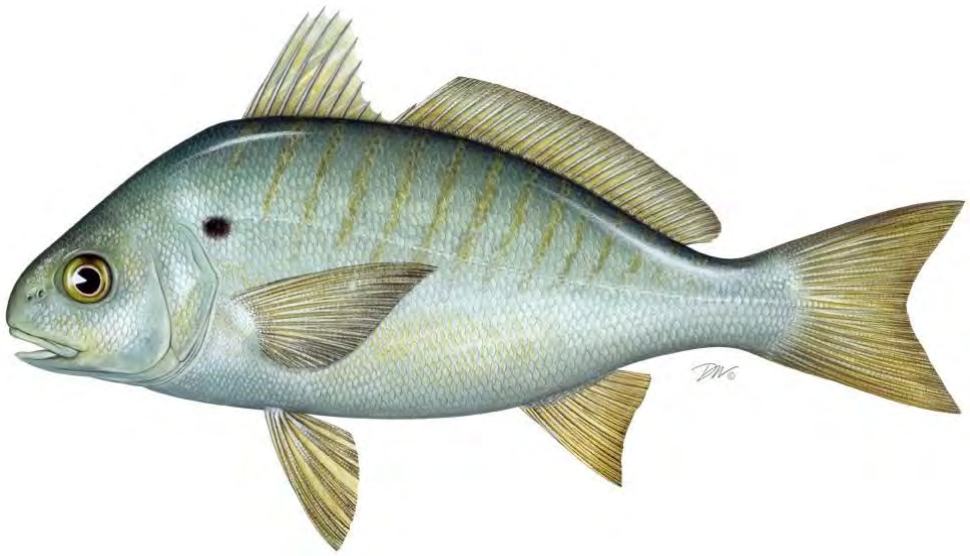
For more information, please contact Tracey Bauer, Fishery Management Plan Coordinator, at 703.842.0723 or tbauer@asmfc.org.

DRAFT DOCUMENT FOR BOARD REVIEW

ATLANTIC STATES MARINE FISHERIES COMMISSION

2024 TRAFFIC LIGHT ANALYSIS REPORT FOR SPOT (*Leiostomus xanthurus)*

2023 Fishing Year



Prepared by the Technical Committee
Drafted July 2024

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

DRAFT DOCUMENT FOR BOARD REVIEW

EXECUTIVE SUMMARY

Background

The purpose of this report is to evaluate the current status of spot using the annual Traffic Light Analysis (TLA). Annually, the Technical Committee (TC) conducts a TLA to evaluate a Mid-Atlantic and a South Atlantic harvest metric, combining commercial and recreational landings in the region. The TC also evaluates a Mid-Atlantic (NJ-VA) and South Atlantic (NC-FL) abundance metric, combining indices of abundance from surveys in the region. Each metric is evaluated using a color proportion of green, yellow, or red calculated for each year based on comparing the respective year to a 2002-2012 reference period. Addendum III defined two thresholds, 30% (proportion=0.30) red as a threshold for moderate concern and 60% (proportion=0.60) red as a threshold for significant concern to the fishery. Management action is triggered according to the 30% red and 60% red thresholds if both the adult abundance and harvest thresholds are exceeded in any two of the three terminal years in either region.

2023 Harvest Metrics

The Mid-Atlantic harvest metric did exceed the red threshold at 30% in two of the three terminal years. The South Atlantic harvest metric exceeded the red threshold at 30% in all three terminal years. The harvest metrics in 2023 cannot be used as a trigger mechanism since they represent years with catch restrictions in place.

2023 Abundance Metrics

The abundance metric did not trigger in two of the three terminal years for both the Mid- and South Atlantic.

Conclusions

Harvest exceeded the 30% threshold in the South Atlantic in all three years and two out of the three terminal years in the Mid-Atlantic. Harvest restrictions put in place in 2021 were still in effect and so the harvest metric cannot be used as a trigger mechanism in 2023. The abundance composite metrics did not trigger in either the Mid-Atlantic or South Atlantic. The TC recommends maintaining current management measures.

DRAFT DOCUMENT FOR BOARD REVIEW

1 INTRODUCTION

Spot is managed under the Omnibus Amendment for Spot, Spotted Seatrout, and Spanish Mackerel (2011), Addendum II (2014), and Addendum III (2020). Addendum III describes the Traffic Light Analysis (TLA) using a regional approach and establishes management actions to be taken if the TLA triggers were tripped. Regions are the South Atlantic (FL-NC) and the Mid-Atlantic (VA-NJ).

The TLA is a way to incorporate multiple data sources (both fishery-independent and -dependent) into a single, easily understood metric for management advice. It is often used for data-limited species, or species that are not assessed on a frequent basis. The name comes from assigning a color (red, yellow, or green) to categorize relative levels of indicators on the condition of the fish population (abundance metric) or fishery (harvest metric).

The TLA uses the following data sources in spot management:

- Harvest Metric: recreational and commercial landings by region
- Abundance Metric: Age 1+ abundance indices by region
    - Mid-Atlantic: Chesapeake Bay Multispecies Monitoring and Assessment Program (ChesMMAP) and the Northeast Fishery Science Center (NEFSC) Multispecies Bottom Trawl Survey
    - South Atlantic: Southeast Area Monitoring and Assessment Program (SEAMAP) and the North Carolina Division of Marine Fisheries (NCDMF) Pamlico Sound Survey (Program 195)

Management action will be triggered according to the current 30% red (moderate concern) and 60% red (significant concern) thresholds if both the abundance and harvest thresholds are exceeded in either region in any two of the three terminal years. The thresholds are defined as the long-term mean of the reference period (2002-2012).

In 2020, the TLA for spot had red proportions that exceeded the 30% threshold for the period of 2017-2019 in harvest composite characteristics for both regions. Exceeding the 30% threshold represents moderate concern to the fishery and initiated a moderate management response. All non-*de minimis* states were required to institute more restrictive measures in their recreational and commercial fisheries. Management measures were initiated in 2021 and are required to remain in place for two years, through 2022. However, the TLA for fishing years 2021 and 2022 resulted in an unknown status due to data issues (e.g., missing years of data due to COVID, vessel changes in ChesMMAP) and uncertainty in how to interpret harvest metrics when management restrictions have been put in place.

Additionally, the TLA was not run at all in 2023 due to data being unavailable and to allow the Atlantic Croaker and Spot Technical Committees to focus on assisting with the Atlantic croaker benchmark stock assessment. A benchmark stock assessment was expected in 2024 for Atlantic croaker, with a benchmark stock assessment for spot to follow once Atlantic croaker's is complete. However, as of July 2024, the Atlantic croaker benchmark is still in development and is unlikely to be completed on time. Therefore, the Sciaenid Board requested the TLA be run for

the August 2024 meeting. The Board requested the TLA focus only on the time series used in management, not the supplemental information provided in previous TLA reports.

2 TRAFFIC LIGHT ANALYSIS RESULTS

2.1 Harvest Composite Characteristic Index (Figure 1 and Figure 2)

- Harvest restrictions were put in place in 2021 in response to the 2020 TLA triggering at the 30% threshold. These restrictions are still in place and thus the harvest metrics cannot be interpreted for the purpose of a TLA, since lower landings get a red designation but measures have been put in place to lower landings.
- Landings in both regions remain low relative to the reference period (2002-2012). It is unknown if this is due to the harvest restrictions or a continued concern for this fishery.
- The Mid-Atlantic harvest exceeds 30% red in two of the three terminal years. The South Atlantic harvest exceeds 30% red in all three terminal years.

2.2 Abundance Composite Characteristic Index (Figure 3 and Figure 4)

- In 2023, the Mid-Atlantic abundance index triggered at the 30% level, but it did not trigger in two of the three terminal years, so overall the abundance index did not trigger for this region.
- The South Atlantic abundance index did not trigger at 30% or 60% in any of the three terminal years.

3 SUMMARY

- Table 1 provides results of the past three years of TLA metrics for each region, as well as the current TLA status.
- Both harvest metrics triggered at the 30% threshold (moderate concern) but cannot be used for management because harvest restrictions have been in place since 2021.
- Neither abundance index triggered at any level.
- The TC recommends maintaining current management measures.

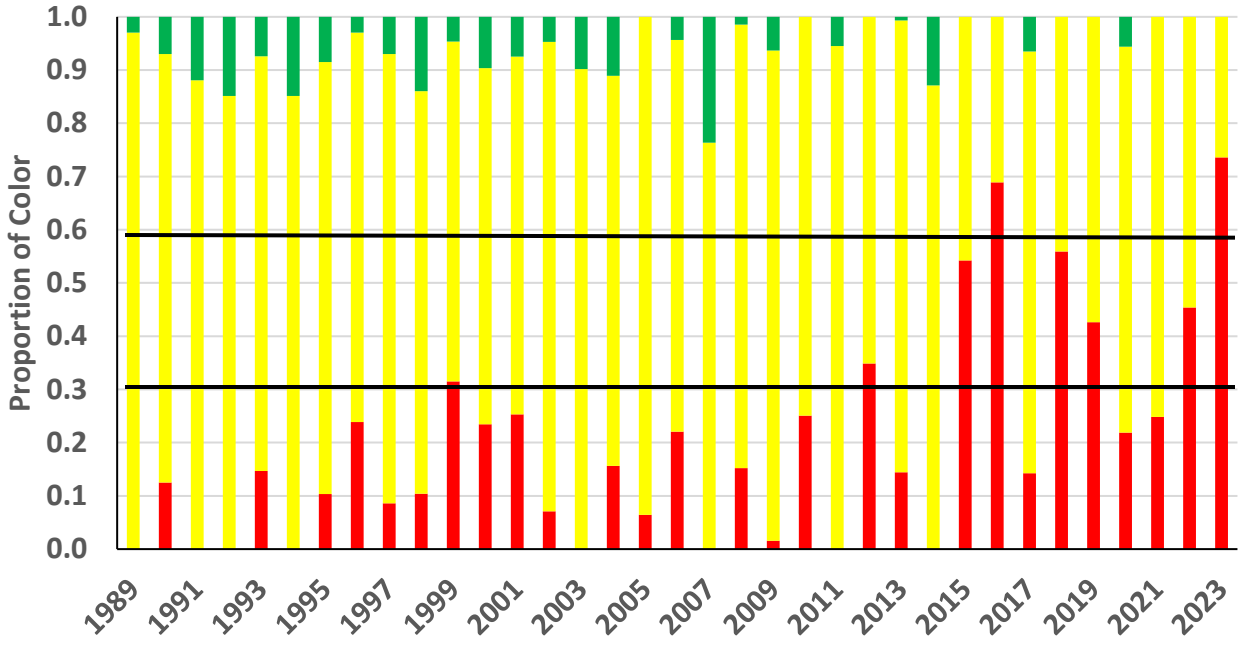


Figure 1. Annual TLA for spot harvest composite (commercial and recreational landings) in the Mid-Atlantic (NJ-VA) from 1989-2023 using a 2002-2012 reference period.

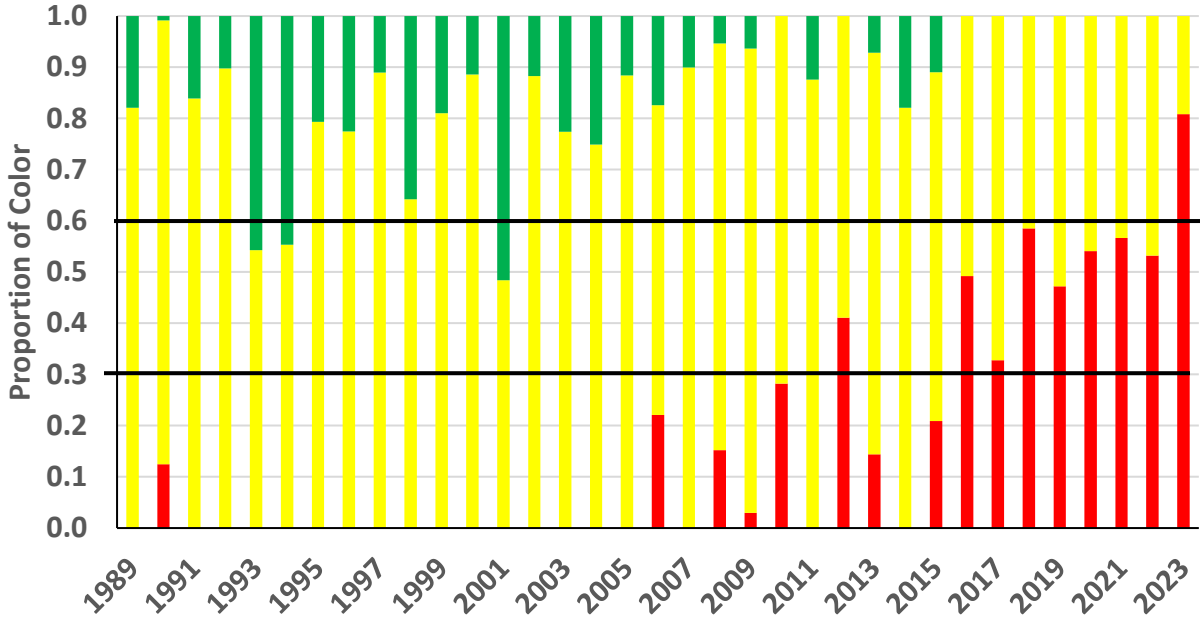


Figure 2. Annual TLA for spot harvest composite (commercial and recreational landings) in the South Atlantic (NC-FL) from 1989-2023 using a 2002-2012 reference period.

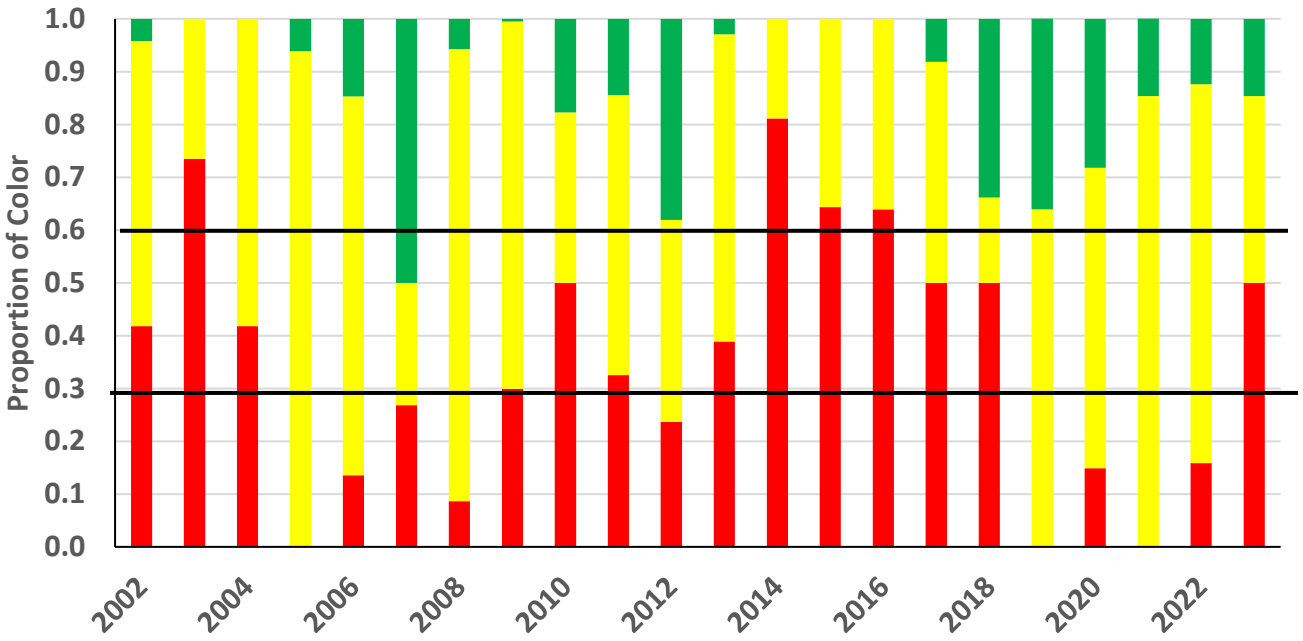


Figure 3. Annual TLA for adult (age 1+) spot composite abundance index in the Mid-Atlantic (NJ-VA; NEFSC and ChesMMAP) from 2002-2023 using a 2002-2012 reference period.

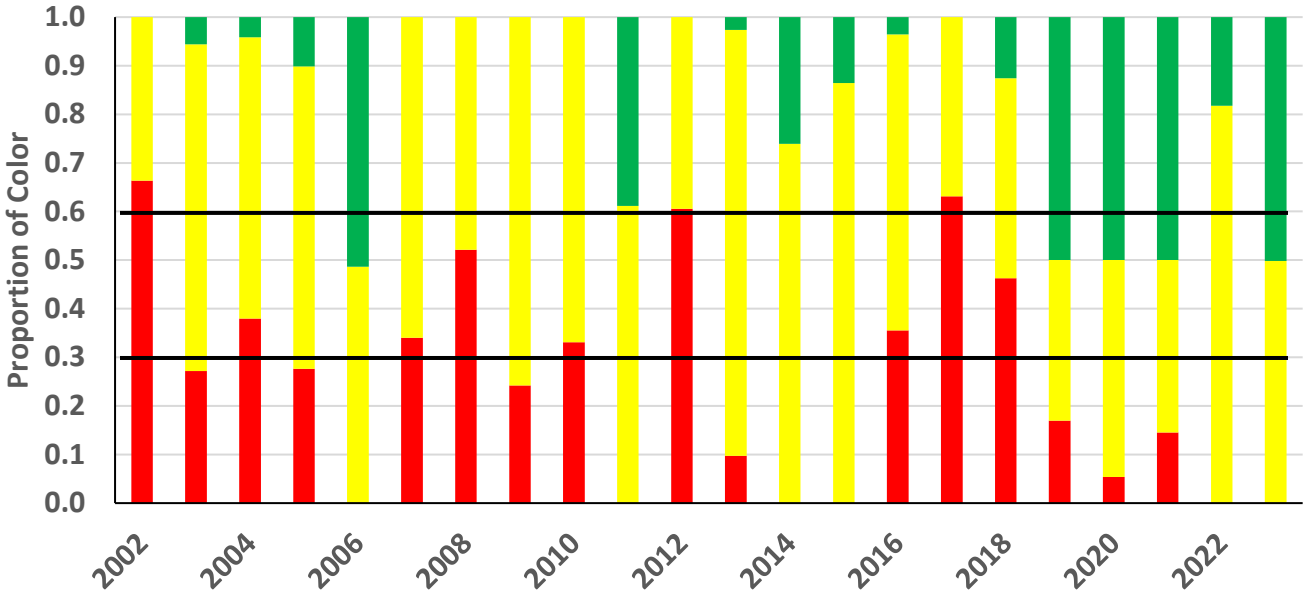


Figure 4. Annual TLA for adult (age 1+) spot composite abundance index in the South Atlantic (NC-FL; SEAMAP and NCDMF Program 195) from 2002-2023 using a 2002-2012 reference period.

Table 1. Traffic light analysis results for the Mid- and South Atlantic regions for 2021-2023. Management action is triggered according to the current 30% and 60% red thresholds if both the adult abundance and harvest metrics exceed these thresholds in any two of the three terminal years within either region.*

TLA Metric	Spot			2023 TLA Status
	2021	2022	2023	
Mid-Atlantic Harvest*	25% red	45% red	74% red (triggered at 30%)	Unknown*
South Atlantic Harvest*	57% red	53% red	81% red (triggered at 30%)	
Mid-Atlantic Adult Index	0% red	16% red	50% red (not triggered)	Not Triggered
South Atlantic Adult Index	15% red	0% red	0% red (not triggered)	

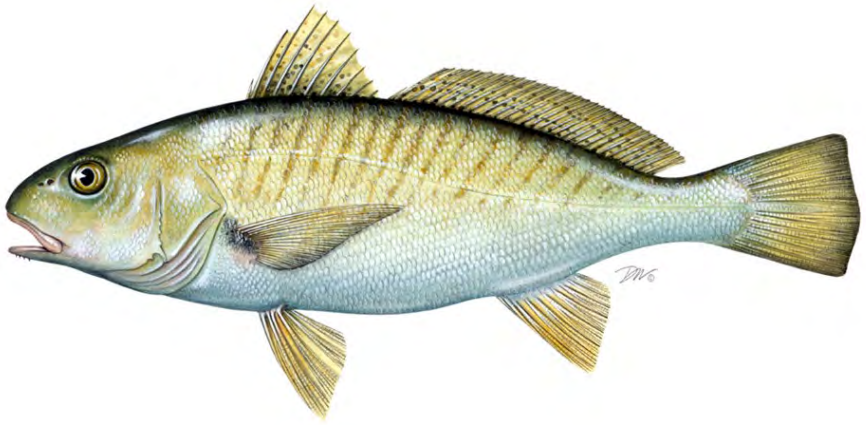
* Harvest metrics cannot be interpreted as a trigger mechanism in the TLA since catch restrictions to lower harvest have been in place since 2021. As long as catch restrictions are in place, trigger status relies solely on the abundance indices.

DRAFT DOCUMENT FOR BOARD REVIEW

ATLANTIC STATES MARINE FISHERIES COMMISSION

2024 TRAFFIC LIGHT ANALYSIS REPORT FOR ATLANTIC CROAKER (*Micropogonias undulatus)*

2023 Fishing Year



Prepared by the Technical Committee
Drafted July 2024

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

DRAFT DOCUMENT FOR BOARD REVIEW

EXECUTIVE SUMMARY

Background

The purpose of this report is to evaluate the current status of Atlantic croaker using the annual Traffic Light Analysis (TLA). Annually, the Technical Committee (TC) conducts a TLA to evaluate a Mid-Atlantic and a South Atlantic harvest metric, combining commercial and recreational landings in the region. The TC also evaluates a Mid-Atlantic (NJ-VA) and South Atlantic (NC-FL) abundance metric, combining indices of abundance from fishery-independent surveys in each region. Each metric is evaluated using a color proportion of green, yellow, or red calculated for each year based on comparing the respective year to a 2002-2012 reference period. Addendum III defined two thresholds, 30% (proportion=0.30) red as a threshold for moderate concern and 60% (proportion=0.60) red as a threshold for significant concern to the fishery. Management action is triggered according to the 30% red and 60% red thresholds if both the adult abundance and harvest thresholds are exceeded for either region in any three of the four terminal years.

2023 Harvest Metrics

The Mid-Atlantic harvest metric has exceeded the 60% red threshold in all four terminal years (2020-2023) and the South Atlantic harvest metric has exceeded the 30% red threshold in all four terminal years. This is the eighth consecutive year the harvest metric in both regions have exceeded the 30% threshold, although the harvest metrics in 2023 cannot be used as a trigger mechanism since they represent a year with catch restrictions in place.

2023 Abundance Metrics

The Mid-Atlantic metric exceeded the 30% threshold for all four of the terminal years and exceeded 60% in two of those years (2020 and 2023). The South Atlantic composite metric did not trigger in 2023 with none of the terminal years exceeding the 30% threshold.

Conclusions

The harvest metric triggered in both the Mid-Atlantic (60% threshold) and South Atlantic (30% threshold) from 2020 to 2023 indicating continued concern. Since harvest restrictions have been in place since 2021, the harvest metric cannot be used as a trigger mechanism in recent years. The abundance metrics triggered for the Mid-Atlantic at the 30% threshold and did not trigger in the South Atlantic. Addendum III states if triggered measures have remained in place for a minimum of four years due to proportions of red above a threshold for either of the composite regional abundance characteristics, the TC will, as part of conducting the annual TLA, evaluate trends in abundance to recommend to the Board whether triggered measures should remain in place or more restrictive measures should be considered. The TC recommends maintaining current management measures.

DRAFT DOCUMENT FOR BOARD REVIEW

1 INTRODUCTION

Atlantic croaker are managed under Amendment 1 to the Interstate Fishery Management Plan for Atlantic Croaker (2005) and Addendum I (2011), Addendum II (2014), and Addendum III (2020). Addendum III describes the Traffic Light Analysis (TLA) using a regional approach and establishes management actions to be taken if the TLA triggers were tripped. Regions are the South Atlantic (FL-NC) and the Mid-Atlantic (VA-NJ).

The TLA is a way to incorporate multiple data sources (both fishery-independent and -dependent) into a single, easily understood metric for management advice. It is often used for data-limited species, or species that are not assessed on a frequent basis. The name comes from assigning a color (red, yellow, or green) to categorize relative levels of indicators on the condition of the fish population (abundance metric) or fishery (harvest metric).

The TLA uses the following data sources in Atlantic croaker management:

- Harvest Metric: recreational and commercial landings by region
- Abundance Metric: Age 2+ abundance indices by region
    - Mid-Atlantic: Chesapeake Bay Multispecies Monitoring and Assessment Program (ChesMMAP) and the Northeast Fishery Science Center (NEFSC) Multispecies Bottom Trawl Survey
    - South Atlantic: Southeast Area Monitoring and Assessment Program (SEAMAP) and the South Carolina Department of Natural Resources (SCDNR) Trammel Net Survey

Management action will be triggered according to the current 30% red (moderate concern) and 60% red (significant concern) thresholds if both the abundance and harvest thresholds are exceeded in either region in any three of the four terminal years. The thresholds are defined as the long-term mean of the reference period (2002-2012).

In 2020, the TLA for Atlantic croaker had red proportions that exceeded the threshold of 30% in both the harvest and abundance metrics in the Mid-Atlantic. The South Atlantic region harvest metric also triggered at 30% threshold in 2020. Exceeding the 30% threshold represents moderate concern to the fishery and initiated a moderate management response. All non-*de minimis* states were required to institute more restrictive measures in their recreational and commercial fisheries. Management measures were initiated in 2021 and are required to remain in place for three years, through 2023.

However, the TLA for fishing years 2021 and 2022 resulted in an unknown status due to data issues (e.g., missing years of data due to COVID, vessel changes in ChesMMAP) and uncertainty in how to interpret harvest metrics when management restrictions have been put in place. Additionally, the TLA was not run at all in 2023 due to data being unavailable and to allow the Atlantic Croaker and Spot Technical Committees to focus on assisting with the Atlantic croaker benchmark stock assessment. A benchmark stock assessment was expected in 2024 for Atlantic croaker. However, as of July 2024, the benchmark is still in development and is unlikely to be completed on time. Therefore, the Sciaenid Board requested the TLA be run for the August

2024 meeting. The Board requested the TLA focus only on the metrics used in management, not the supplemental information provided in previous TLA reports.

2 TRAFFIC LIGHT ANALYSIS RESULTS

2.1 Harvest Composite Index (Figure 1 and Figure 2)

- Harvest restrictions were put in place in 2021 in response to the 2020 TLA triggering at the 30% threshold. These restrictions are still in place and thus the harvest metrics cannot be interpreted for the purpose of a TLA, since lower landings get a red designation but measures have been put in place to lower landings.
- Landings in both regions remain low relative to the reference period (2002-2012). It is unknown if this is due to the harvest restrictions or a continued concern for this fishery.
- The Mid-Atlantic harvest exceeds 60% red in all four terminal years. The South Atlantic harvest exceeds 30% red in all four terminal years.
- This is the eighth consecutive year the harvest metric in both regions have exceeded the 30% threshold.

2.2 Abundance Composite Characteristic Index (Figure 3 and Figure 4)

- The Mid-Atlantic abundance index exceeded 30% red threshold in all four of the terminal years. It exceeded the 60% red threshold in two of the four terminal years. Therefore, the Mid-Atlantic abundance index triggered at the 30% level, indicating moderate concern.
- The South Atlantic abundance index did not trigger at 30% or 60% levels. The last four years are predominantly green or yellow, representing no concern.

3 SUMMARY

- Table 1 provides results of the past four years of TLA metrics for each region, as well as the current TLA status.
- Because the harvest metrics cannot be interpreted when management is in place to keep harvest low, interpretation of the TLA relies on the abundance composite indices. Although the South Atlantic abundance index did not trigger at any level, the Mid-Atlantic abundance index did exceed the 30% threshold in all four terminal years.
- The TC recommends maintaining current management measures.

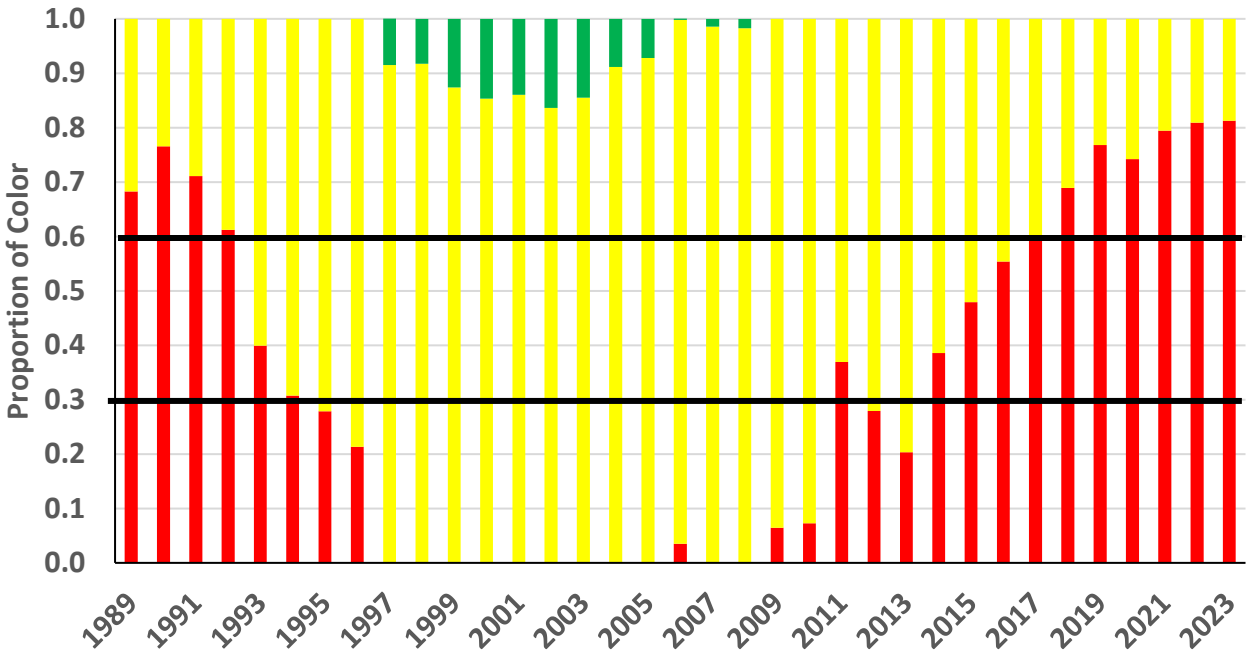


Figure 1. Annual TLA for Atlantic croaker harvest composite (commercial and recreational landings) in the Mid-Atlantic (NJ-VA from 1989-2023 using a 2002-2012 reference period.

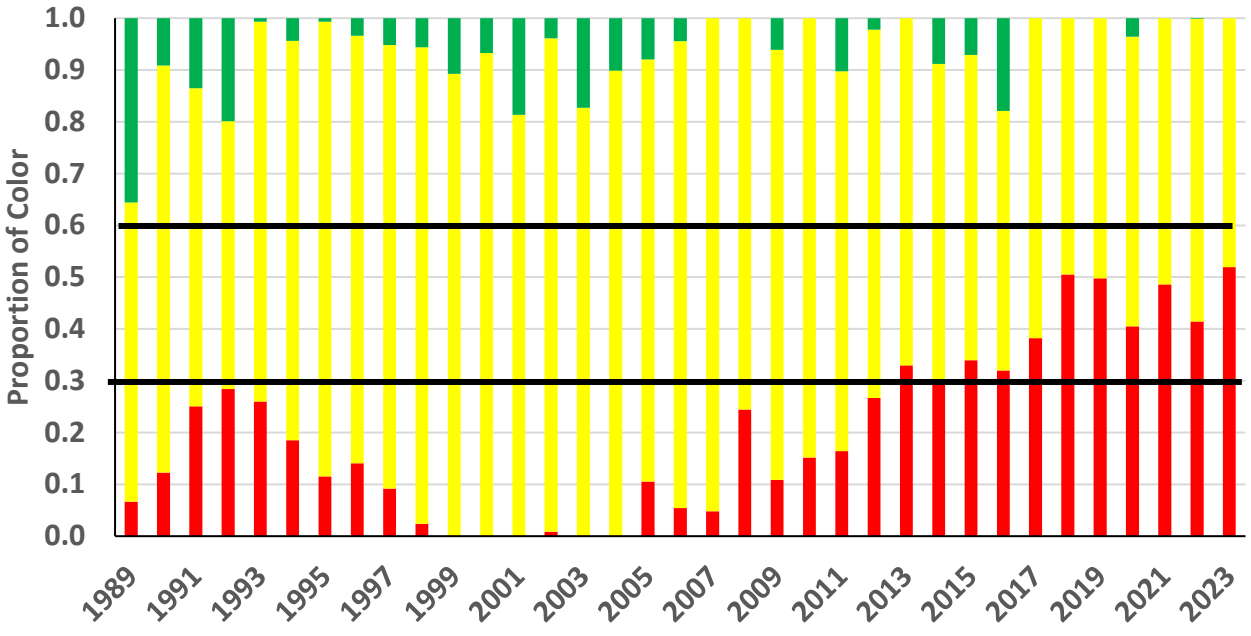


Figure 2. Annual TLA for Atlantic croaker harvest composite (commercial and recreational landings) in the South Atlantic (NC-FL) from 1989-2023 using a 2002-2012 reference period.

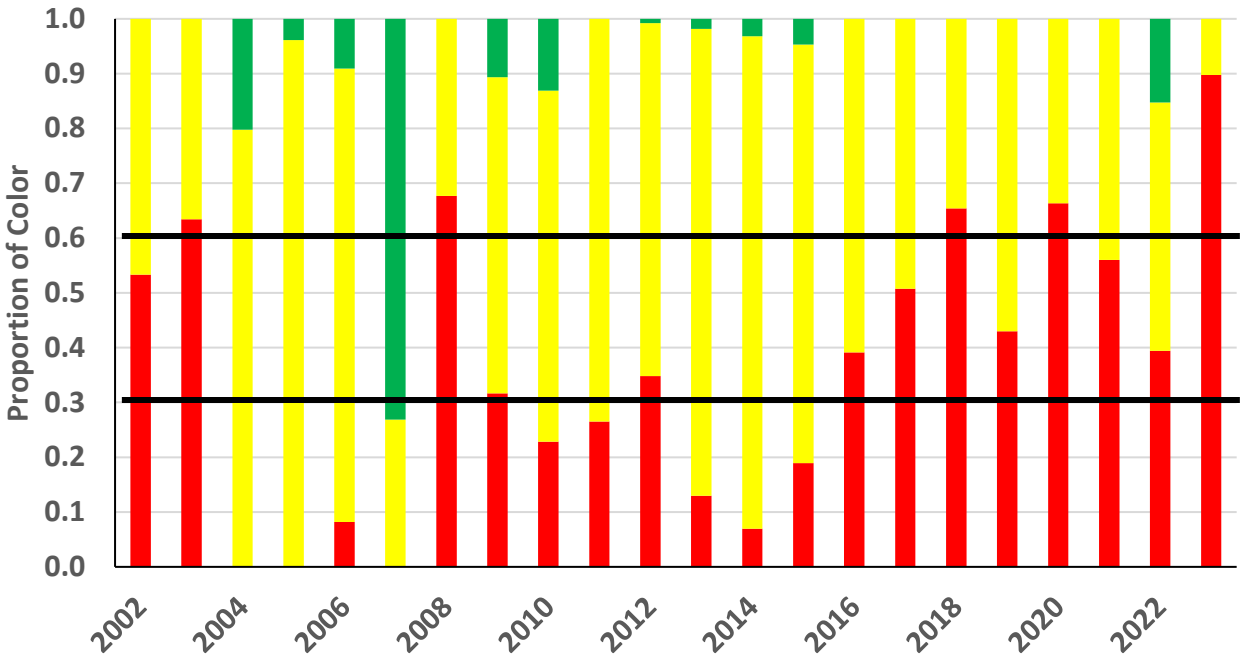


Figure 3. Annual TLA for adult (age 2+) Atlantic croaker composite abundance index in the Mid-Atlantic (NEFSC and ChesMMAP surveys) from 2002-2023 using a 2002-2012 reference period.

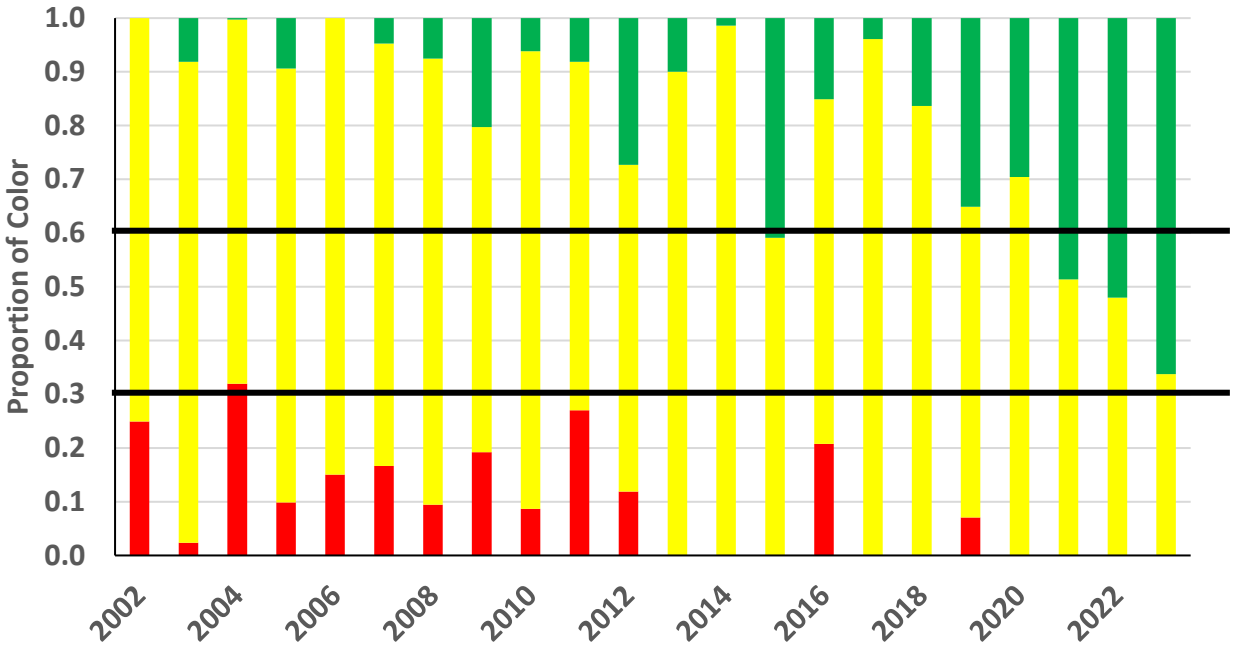


Figure 4. Annual TLA for adult (age 2+) Atlantic croaker composite abundance index in the South Atlantic (SEAMAP and SCDNR trammel survey) from 2002-2023 using a 2002-2012 reference period.

Table 1. Traffic light analysis results for the Mid- and South Atlantic regions for 2020-2023. There were some missing data in 2020 data (e.g., COVID, vessel changes). Management action is triggered according to the current 30% and 60% red thresholds if both the adult abundance and harvest metrics exceed these thresholds in any three of the four terminal years within either region.*

TLA Metric	Atlantic Croaker				2023 TLA Status
	2020	2021	2022	2023	
Mid-Atlantic Harvest*	74% red	79% red	81% red	81% red (triggered at 60%)	Unknown*
South Atlantic Harvest*	41% red	49% red	41% red	52% red (triggered at 30%)	
Mid-Atlantic Adult Index	66% red	56% red	39% red	90% red (triggered at 30%)	Triggered
South Atlantic Adult Index	Unknown	0% red	0% red	0% red (not triggered)	

*Harvest metrics cannot be interpreted as a trigger mechanism in the TLA at this time since catch restrictions to lower harvest were in place since 2021. As long as catch restrictions are in place, trigger status relies solely on the abundance indices.

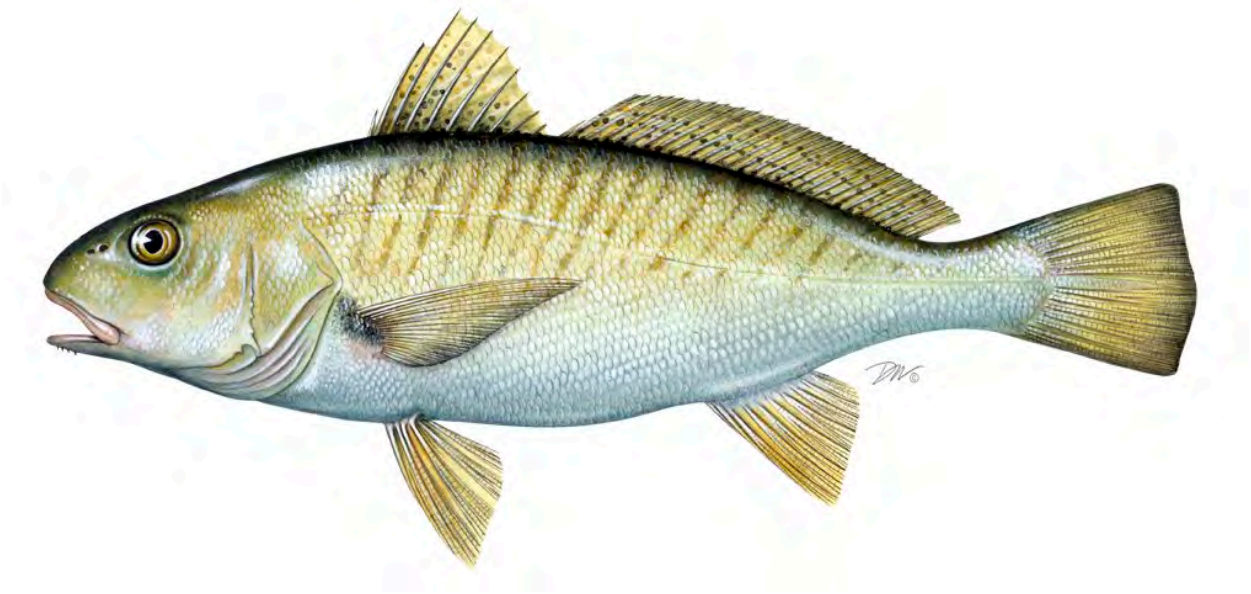
DRAFT FOR BOARD REVIEW

ATLANTIC STATES MARINE FISHERIES COMMISSION

REVIEW OF THE INTERSTATE FISHERY MANAGEMENT PLAN

FOR ATLANTIC CROAKER
(Micropogonias undulatus)

2023 FISHING YEAR



Prepared by the Plan Review Team
Drafted July 2024

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

DRAFT FOR BOARD REVIEW

Table of Contents

DRAFT FOR BOARD REVIEW

I. Status of the Fishery Management Plan

Date of FMP Approval:	Original FMP – October 1987
Amendments:	Amendment 1 – November 2005 (implemented January 2006) Addendum I – March 2011 Addendum II – August 2014 Addendum III – February 2020
Management Areas:	The Atlantic coast distribution of the resource from New Jersey through Florida
Active Boards/Committees:	South Atlantic State/Federal Fisheries Management Board; Atlantic Croaker Technical Committee, Stock Assessment Subcommittee, and Plan Review Team; South Atlantic Species Advisory Panel

The Fishery Management Plan (FMP) for Atlantic Croaker was adopted in 1987 and included the states from Maryland through Florida (ASMFC 1987). In 2004, the South Atlantic State/Federal Fisheries Management Board (Board) found the recommendations in the FMP to be vague, and recommended that an amendment be prepared to define management measures necessary to achieve the goals of the FMP. The Interstate Fisheries Management Program Policy Board also adopted the finding that the original FMP did not contain any management measures that states were required to implement.

In 2002, the Board directed the Atlantic Croaker Technical Committee (TC) to conduct the first coastwide stock assessment of the species to prepare for developing an amendment. The Atlantic Croaker Stock Assessment Subcommittee developed a stock assessment in 2003, which was approved by a Southeast Data Assessment Review (SEDAR) panel for use in management in June 2004 (ASMFC 2005a). The Board quickly initiated development of an amendment and, in November 2005, approved Amendment 1 to the Atlantic Croaker FMP (ASMFC 2005b). The amendment was fully implemented by January 1, 2006.

The goal of Amendment 1 was to utilize interstate management to perpetuate the self-sustainable Atlantic croaker resource throughout its range and generate the greatest economic and social benefits from its commercial and recreational harvest and utilization over time. Amendment 1 contains four objectives:

1) Manage the fishing mortality rate for Atlantic croaker to provide adequate spawning potential to sustain long-term abundance of the Atlantic croaker population.
2) Manage the Atlantic croaker stock to maintain the spawning stock biomass above the target biomass levels and restrict fishing mortality to rates below the threshold.
3) Develop a management program for restoring and maintaining essential Atlantic croaker habitat.

4) Develop research priorities that will further refine the Atlantic croaker management program to maximize the biological, social, and economic benefits derived from the Atlantic croaker population.

Amendment 1 expanded the management area to include the states from New Jersey through Florida. Consistent with the stock assessment completed in 2004, the amendment defined two Atlantic coast management regions: the south-Atlantic region, from Florida through South Carolina; and the mid-Atlantic region, from North Carolina through New Jersey.

Amendment 1 established biological reference points (BRPs) to define an overfished and overfishing stock status for the mid-Atlantic region only. Reliable stock estimates and BRPs for the South Atlantic region could not be developed during the 2004 stock assessment due to a lack of data. The BRPs were based on maximum sustainable yield (MSY), and included threshold and target levels of fishing mortality (F) and spawning stock biomass (SSB): F threshold = F_{MSY} (estimated to be 0.39); F target = 0.75 X F_{MSY} (estimated to be 0.29); SSB threshold = 0.7 X SSB_{MSY} (estimated to be 44.65 million pounds); and SSB target = SSB_{MSY} (estimated to be 63.78 million pounds). An SSB estimate below the SSB threshold resulted is an overfished status determination, and an F estimate above the F threshold resulted is an overfishing status determination. The Amendment established that the Board would take action, including a stock rebuilding schedule if necessary, should the BRPs indicate the stock is overfished or overfishing is occurring.

Amendment 1 did not require any specific measures restricting recreational or commercial harvest of Atlantic croaker. States that already had more conservative measures were encouraged to maintain those regulations (Table 1). The Board was able to revise Amendment 1 through adaptive management, including any regulatory and/or monitoring requirements in subsequent addenda, along with procedures for implementing alternative management programs via conservation equivalency.

The Board initiated Addendum I to Amendment I at its August 2010 meeting, following the updated stock assessment, in order to address the proposed reference points and management unit. The stock assessment evaluated the stock as a coastwide unit, rather than the two management units established within Amendment I. In approving Addendum I, the Board endorsed consolidating the stock into one management unit, as proposed by the stock assessment. In addition, Addendum I established a procedure, similar to other species, by which the Board may approve peer-reviewed BRPs without a full administrative process, such as an amendment or addendum.

In August 2014, the Board approved Addendum II to the Atlantic Croaker FMP. The Addendum established the Traffic Light Approach (TLA) as the new precautionary management framework to evaluate fishery trends and develop management actions. The TLA was originally developed as a management tool for data poor fisheries. The name comes from assigning a color (red, yellow, or green) to categorize relative levels of population indicators. When a population characteristic improves, the proportion of green in the given year increases. Harvest and abundance thresholds of 30% and 60% were established in Addendum II, representing

moderate and significant concern for the fishery. If thresholds for both population characteristics achieve or exceed a threshold for a three year period, then management action is enacted.

The TLA framework replaces the management triggers stipulated in Addendum I, which dictated that action should be taken if recreational and commercial landings dropped below 70% of the previous two-year average. Those triggers were limited in their ability to illustrate long-term declines or increases in stock abundance. In contrast, the TLA approach is capable of better illustrating trends in the fishery through changes in the proportion of green, yellow, and red coloring. A 2018 TC report recommended several updates to the current TLA approach (ASMFC 2018). The Board initiated an Addendum III to incorporate these updates.

In February 2020 the Board approved Addendum III to Amendment 1 of the Atlantic Croaker FMP. This addendum adjusted the TLA to incorporate additional fishery-independent indices, age information, use of regional characteristics, and changes to the management triggering mechanisms. Management triggers and responses include bag limits for the recreational fishery and percentage harvest reductions from a 10-year average for the commercial fishery. The response will be defined by which percent threshold (30% or 60%) that was exceeded in any of the 3 out of 4 terminal years.

Addendum III did not add or change any management measures or requirements, unless management-triggering mechanisms are tripped. The only pre-existing requirement is for states to submit an annual compliance report by July 1st of each year that contains commercial and recreational landings as well as results from any monitoring programs that intercept Atlantic croaker.

II. Status of the Stock

The most recent stock assessment, conducted in 2017, was not recommended for management use upon peer review. Therefore, current stock status is unknown. The Peer Review Panel did not indicate problems in the Atlantic croaker fishery that would require immediate management action but did recommend continued evaluation of the fishery using the annual TLA.

The conclusions of the 2010 stock assessment (ASMFC 2010), which is the most recent assessment that was recommended by peer review for management use, were that Atlantic croaker was not experiencing overfishing and biomass had increased and fishing mortality decreased since the late 1980s. The 2010 assessment was unable to confidently determine stock status, particularly with regards to biomass, due to an inability to adequately estimate removals from discards of the South Atlantic shrimp trawl fishery. Improvements on estimation of these discards were made in the 2017 assessment, allowing the potential for shrimp trawl discards to be included as supplemental information with the annual TLA. Annual monitoring of shrimp trawl fishery discards is important because these discards represent a considerable proportion of Atlantic croaker removals, ranging from 7% to 78% annually during 1988-2008, according to the 2010 assessment (ASMFC 2010).

One of the primary reasons that the 2017 stock assessment did not pass peer review was due to conflicting signals in harvest and abundance metrics. Theoretically, increases in adult abundance should result in more fish available to be caught by the fishery; thus, fishing would be more efficient (greater catch per unit effort) and harvest would increase in a pattern similar to adult abundance. However, several recent abundance indices have shown increases while harvest has declined to some of the lowest levels on record. One factor thought to contribute to overestimates of adult abundance is an increase in the number of juveniles misclassified as adults in surveys that historically have typically caught adults.

In response, the Atlantic Croaker TC recommended several changes to the annual TLA through Addendum III. The addendum added indices from the Chesapeake Bay Multispecies Monitoring and Assessment Program (ChesMMAP) and the South Carolina Department of Natural Resources (SCDNR) Trammel Net Survey into the adult composite characteristic index. In addition, all surveys used revised adult abundance indices and now have an established reference period of 2002-2012. Regional metrics were also used to characterize the fisheries north and south of the Virginia-North Carolina state line. The ChesMMAP and the Northeast Fisheries Science Center (NEFSC) surveys will be used to characterize abundance north of the state line, and SCDNR Trammel Net and Southeast Area Monitoring and Assessment Program (SEAMAP) surveys will be used to characterize abundance south of the state line.

III. Status of the Fishery

Total Atlantic croaker harvest (recreational and commercial) from New Jersey through the east coast of Florida in 2023 is estimated at 2.3 million pounds (Tables 2 and 3, Figure 1). This represents an 16% decrease in total harvest from 2022 (2.8 million pounds). The commercial and recreational fisheries harvested 22% and 78% of the 2023 total, respectively, which continues a trend that began in 2020, of the recreational fishery harvesting a majority (2020-2023 average=76%) of the total Atlantic croaker harvest. This represents a large shift from the historical spilt of recreational and commercial Atlantic croaker harvest, averaging 43% and 57%, respectively.

Atlantic coast commercial landings of Atlantic croaker exhibit a cyclical pattern, with low harvests in the 1960s to early 1970s and the 1980s to early 1990s, and high harvests in the mid-to-late 1970s and the mid-1990s to early 2000s (Figure 1). Commercial landings increased from a low of 3.7 million pounds in 1991 to 28.6 million pounds in 2001; however, landings have had a declining trend since then, from 47 million pounds in 2003 to 505,828 pounds in 2023, the lowest value of the time series (1950-2023). Within the management unit, the majority of 2023 commercial landings came from North Carolina (49%), Virginia (27%), and Florida (20%).

From 1981-2023, recreational landings of Atlantic croaker from New Jersey through Florida have varied by count between 5.1 million fish in 2022 and 36.2 million fish in 1986 and by weight between 1.8 million pounds in 2023 and 18.9 million pounds in 2003 (Tables 4 and 5, Figure 2). Landings generally increased from 1990 until 2003, after which they showed a declining trend through 2023. The 2023 landings are estimated at 5.5 million fish and 1.8

million pounds, similar to 2022's landings of 5.1 million fish and 2.1 million pounds. Virginia was responsible for 43% of the 2023 recreational landings, in numbers of fish, followed by Florida (16%), and South Carolina (14%).

The number of recreational releases generally increased over the time series until 2013 when releases steadily declined until reaching a low of 18.1 million fish released in 2018 (Table 5 and Figure 2). From 2018 through 2023, releases have overall been increasing again. In 2023, anglers released 34.9 million fish, an increase from the 30.5 million fish released in 2022. Anglers also released a greater percentage of the total recreational catch in 2023, compared to 2022. An estimated 86.4% of the total recreational croaker catch was released in 2023, the highest percentage on record for a third year in a row (Figure 2). The percentage of released recreational catch has shown an increasing trend from the 1990s through 2023.

IV. Status of Assessment Advice

A statistical catch-at-age (SCA) model was used in the 2010 Atlantic croaker stock assessment (ASMFC 2010). This model combines catch-at-age data from the commercial and recreational fisheries with information from fishery-independent surveys and biological information such as growth rates and natural mortality rates to estimate the size of each age class and the exploitation rate of the population. The assessment was peer reviewed by a panel of experts in conjunction with the Southeast Data, Assessment, and Review (SEDAR) process.

The benchmark stock assessment conducted in 2017 was not recommended for management use due to uncertainty in biomass estimates resulting from conflicting signals among abundance indices and catch time series as well as sensitivity of model results to assumptions and model inputs. Specifically, model-estimated values of stock size, fishing mortality, and biological reference points are too uncertain for use; however, the trends in model-estimated parameters and ratio-based fishing F reference points are considered reliable. Currently, a Traffic Light Analysis (TLA) is used to monitor the stock and make management decisions in lieu of an approved stock assessment. The TLAs can be found here. A benchmark stock assessment for Atlantic croaker is currently underway.

V. Status of Research and Monitoring

There are no research or monitoring programs required of the states except for the submission of an annual compliance report. New Jersey, Delaware, Maryland, Potomac River Fisheries Commission (PRFC), Virginia, North Carolina, South Carolina, and Georgia conduct fishery-dependent (other than catch and effort data) monitoring programs. All states and jurisdictions conduct fishery-independent monitoring programs along the Atlantic coast from New Jersey to Florida.

The NEFSC performs a randomly stratified groundfish survey from Cape Hatteras, North Carolina to Maine. Atlantic croaker are one of the main species caught throughout much of the survey area and, since the surveys started in 1972, it provides a long term data set. Since 1994,

there has been an increase in annual catch variability. The NEFSC survey was not carried out in 2020 due to the COVID-19 pandemic, but was active again in 2021.

VI. Status of Management Measures and Issues

Fishery Management Plan

Amendment 1 was fully implemented by January 1, 2006, and provided the management plan for the 2009 fishing year. There are no interstate regulatory requirements for Atlantic croaker. Should regulatory requirements be implemented in the future, all state programs must include law enforcement capabilities adequate for successfully implementing the regulations. Addendum I to Amendment 1 was initiated in August 2010 and approved in March 2011, in order to 1) revise the biological reference points to be ratio-based, and 2) remove the distinction of two regions within the management unit, based on the results of the 2010 stock assessment. Addendum II was approved August 2014 and established the TLA management framework for Atlantic croaker in order to better illustrate long-term trends in the fishery. Addendum III was approved February 2020 and adjusted management though the TLA by incorporating additional fishery-independent indices, age information, use of regional characteristics, and changes to the management-triggering mechanisms.

Traffic Light Approach

Harvest Composite Index (Figure 3 and Figure 4)

- Harvest restrictions were put in place in 2021 in response to the 2020 TLA triggering at the 30% threshold. These restrictions are still in place and thus the harvest metrics cannot be interpreted for the purpose of a TLA, since lower landings get a red designation but measures have been put in place to lower landings.
- Landings in both regions remain low relative to the reference period (2002-2012). It is unknown if this is due to the harvest restrictions or a continued concern for this fishery.
- The Mid-Atlantic harvest exceeds 60% red in all four terminal years. The South Atlantic harvest exceeds 30% red in all four terminal years.
- This is the eighth consecutive year the harvest metric in both regions have exceeded the 30% threshold.

Abundance Composite Characteristic Index (Figure 5 and Figure 6)

- The Mid-Atlantic abundance index exceeded 30% red threshold in all four of the terminal years. It exceeded the 60% red threshold in two of the four terminal years. Therefore, the Mid-Atlantic abundance index triggered at the 30% level, indicating moderate concern.
- The South Atlantic abundance index did not trigger at 30% or 60% levels. The last four years are predominantly green or yellow, representing no concern.

Conclusions

- Because the harvest metrics cannot be interpreted when management is in place to keep harvest low, interpretation of the TLA relies on the abundance composite indices. Although the South Atlantic abundance index did not trigger at any level, the Mid-Atlantic abundance index did exceed the 30% threshold in all four terminal years. This means the Atlantic croaker stock as a whole remains triggered.
- The TC recommends maintaining management enacted in 2021.

De Minimis Requests

States are permitted to request *de minimis* status if, for the preceding three years for which data are available, their average commercial landings or recreational landings (by weight) constitute less than 1% of the coastwide commercial or recreational landings for the same three-year period. A state may qualify for *de minimis* in either its recreational or commercial sector, or both, but will only qualify for exemptions in the sector(s) that it qualifies for as *de minimis*. Amendment 1 does not include any compliance requirements other than annual state reporting, which is still required of *de minimis* states. Addendum III, depending on the level of management action triggered, has exemptions for *de minimis* states when measures are triggered at the 30% level (see above for the TLA description). If the TLA triggers at the 60% level, then all states, including *de minimis*, must implement management measures.

In the annual compliance reports, the following states requested *de minimis* status: New Jersey (commercial and recreational fisheries), Delaware (commercial fishery), South Carolina (commercial fishery), and Georgia (commercial fishery). The commercial and recreational *de minimis* criteria for 2023 are based on 1% of the average coastwide 2021-2023 landings in each fishery. New Jersey, Delaware, South Carolina, and Georgia commercial fisheries all qualify for *de minimis* status, but landings are confidential. New Jersey's recreational fishery did not qualify for *de minimis* status, as the 3-year average of recreational landings for both states constituted more than 1% of the coastwide recreational landings, at 1.2%.

Changes to State Regulations

In 2020, the TLA triggered management measures at the 30% level, or moderate concern. Non *de minimis* states were required to implement management measures that instituted a 50 fish recreational bag limit and reduce the commercial harvest by 1% of the average state commercial harvest from the previous 10 years. If the state had more restrictive measures in place, they did not need to make any changes. All proposed management changes were reviewed by the Technical Committee and approved by the Board. Below is a list of states that who implemented measures in 2021:

- Virginia: 50 fish bag limit, charter allowance, and commercial fishery season closure from January 1 to January 15. Approved on March 23, 2021.
- North Carolina: 50 fish bag limit and a commercial fishery season closure from December 16 to December 31. Proclamation authority published on April 15, 2021.
- Florida: 50 fish bag limit and a commercial vessel limit of 1,200 pounds in state waters. Rule published December 1, 2021.

The Potomac River Fisheries Commission implemented a season closure for the Atlantic croaker commercial fishery from September 30 to December 31. It was approved on December 2, 2021.

For 2023, since Delaware has not requested *de minimis* status for its recreational fishery, they will be required to implement the 50 fish bag limit in order to stay in compliance with the FMP. The time requirement to implement this regulation is up to the Sciaenids Board.

Atlantic Croaker Habitat
In 2017, the ASMFC Habitat Committee released *Atlantic Sciaenid Habitats: A Review of Utilization, Threats, and Recommendations for Conservation, Management, and Research*, which outlines the habitat needs of Atlantic croaker at different life stages (egg, larval, juvenile, adult). This report also highlights threats and uncertainties facing these ecological areas and identifies Habitat Areas of Particular Concern. It can be found online at: http://www.asmfc.org/files/Habitat/HMS14_AtlanticSciaenidHabitats_Winter2017.pdf.

Bycatch Reduction
Atlantic croaker are subject to both direct and indirect fishing mortality. Historically, Atlantic croaker ranked as one of the most abundant bycatch species of the South Atlantic shrimp trawl fishery, resulting in the original FMP's recommendation that bycatch reduction devices (BRDs) be developed and required in the shrimp trawl fishery. Since then, the states of North Carolina through Florida have all enacted requirements for the use of BRDs in shrimp trawl nets in state waters, reducing croaker bycatch from this fishery (ASMFC 2010). However, bycatch and discard monitoring from the shrimp trawl fishery have historically been inadequate, resulting in a major source of uncertainty for assessing this stock, as well as other important Mid- and South Atlantic species. Most of the discarded croaker are age-0 and thus likely have not yet reached maturity (ASMFC 2010). The North Carolina Division of Marine Fisheries conducted a two-year study, published in 2015, to collect bycatch data from state shrimp trawlers. It found that Atlantic croaker represent between 34-49% of the total observed finfish bycatch by weight in estuarine waters and between 20-42% in ocean waters. The at-net mortality for Atlantic croaker was found to be 23% (Brown 2015). These data will be valuable for incorporating estimates of removals in future stock assessments.

Developed during the 2017 benchmark assessment, discard estimates of Atlantic croaker in the South Atlantic Shrimp Trawl Fishery are informed by catch rates observed during the SEAMAP survey and South Atlantic Shrimp Trawl Fishery Observer Program, and total effort of the South Atlantic Shrimp Trawl Fishery. Increases in discards could be an indicator of higher abundance of juveniles in the region, an increase in effort by the fishery, or a combination of both. Discard estimates of Atlantic croaker in the South Atlantic Shrimp Trawl Fishery were not calculated in 2024, as the Sciaenids Management Board directed the TCs to focus on updating only the Harvest and Abundance Characteristic Indices used for management. A summary of the most recent analysis can be found in the FMP Review for fishing year 2021, as the Atlantic croaker benchmark assessment is still ongoing. For additional information on the South Atlantic Shrimp Trawl Fishery discard estimation, see Appendix 1 of the 2020 TLA Update Report.

Atlantic croaker are also discarded from other commercial fishing gears, primarily due to market pressures and few restrictions on croaker harvest at the state level. The National

Oceanic and Atmospheric Administration (NOAA) Fisheries Pelagic Observer Program provides data to estimate these discards for use in assessments; however, the time series is limited and only discards from gill nets and otter trawls could be estimated for the 2010 assessment based on the available data. Since 1988, estimated discards have fluctuated between 94 and 15,176 mt without trend, averaging 2,503 mt (ASMFC 2010).

Atlantic croaker are also a major component of the scrap/bait fishery. Landings from this fishery are not reported at the species level, except in North Carolina, which has a continuous program in place to sample these landings and enable estimation of croaker scrap landings for use in the stock assessment. As part of the 2010 stock assessment, North Carolina estimated the scrap/bait landings, which have declined in recent years, from a high of 1,569 mt in 1989 to a low of 84 mt in 2008, primarily due to restrictions placed on fisheries producing the highest scrap/bait landings (ASMFC 2010). Regulations instituted by North Carolina include a ban on flynet fishing south of Cape Hatteras, incidental finfish limits for shrimp and crab trawls in inside waters, minimum mesh size restrictions in trawls, and culling panels in long haul seines.

South Carolina began a state monitoring program to account for bait landings in 2015. The state initiated a bait harvester trip ticket program for all commercial bait harvesters licensed in South Carolina. The impetus for this program is to track bait usage of small sciaenid species (croaker, spot, and whiting) as well as other important bait species.

Several states have implemented other commercial gear requirements that further reduce bycatch and bycatch mortality, while others continue to encourage the use of the BRD devices. NOAA Fisheries published a final rule with an effective date of April 1, 2021 requiring all skimmer trawls greater than 40 feet in length to use TEDs. For all other vessels, the net must be emptied of catch on the deck within a specified time (84 FR 70048). Continuing to reduce the quantity of sub-adult croaker harvested should increase spawning stock biomass and yield per recruit.

Atlantic croaker are also subject to recreational discarding. The percentage of Atlantic croaker released alive by recreational anglers has generally increased over time. Discard mortality was estimated to be 10% for the 2010 stock assessment (ASMFC 2010). The use of circle hooks and appropriate handling techniques can help reduce mortality of released fish.

VII. Implementation of FMP Compliance Requirements for 2023

The PRT found no inconsistences among states with regard to the requirements of Amendment 1 and Addendum III. However, Delaware will now be required to implement the 50 fish bag limit for their recreational fishery since they are no longer a *de minimis* state for their recreational fishery.

VIII. Recommendations

Management and Regulatory Recommendations

- Consider approval of the *de minimis* requests from New Jersey, Delaware, South Carolina, and Georgia for their commercial fisheries.
- Consider approval of the *de minimis* request from New Jersey for their recreational fishery. The PRT noted that New Jersey's recreational fishery exceeded the 1% *de minimis* threshold this year, which was the first year they have exceeded the threshold since 2017. The PRT agreed to recommend *de minimis* status for an additional year to confirm if there is a consistent trend of higher recreational landings of Atlantic croaker in New Jersey. The PRT will continue to monitor the situation and if New Jersey's Atlantic croaker recreational fishery exceeds the 1% threshold again next year, they will no longer recommend *de minimis* status.
- Research into the impacts of climate change on the range of the species.
- Research into Atlantic croaker juvenile discard mortality for recreational and commercial fisheries by each gear type in regions where removals are highest.

Research and Monitoring Recommendations

Additional research and monitoring recommendations can be found in the 2016 Atlantic Croaker Stock Assessment Peer Review Report here under Term of Reference 8.

IX. References

Atlantic States Marine Fisheries Commission (ASMFC). 1987. Fishery Management Plan for Atlantic Croaker. Washington (DC): ASMFC. Fishery Management Report No. 10. 90 p.

ASMFC. 2005a. Atlantic Croaker Stock Assessment & Peer Review Reports. Washington (DC): ASMFC. 370 p.

ASMFC. 2005b. Amendment 1 to the Interstate Fishery Management Plan for Atlantic Croaker. Washington (DC): ASMFC. Fishery Management Report No. 44. 92 p.

ASMFC. 2010. Atlantic Croaker 2010 Benchmark Stock Assessment. Washington (DC): ASMFC. 366 p.

ASMFC. 2018. Memorandum 18-8: Recommended Updates to the Annual Traffic Light Analyses for Atlantic Croaker and Spot.

Brown, K. 2015. Characterization of the commercial shrimp otter trawl fishery in the estuarine and ocean (0-3 miles) waters of North Carolina. Morehead City (NC): NCDEQ, Division of Marine Fisheries. Abstract.

X. Figures

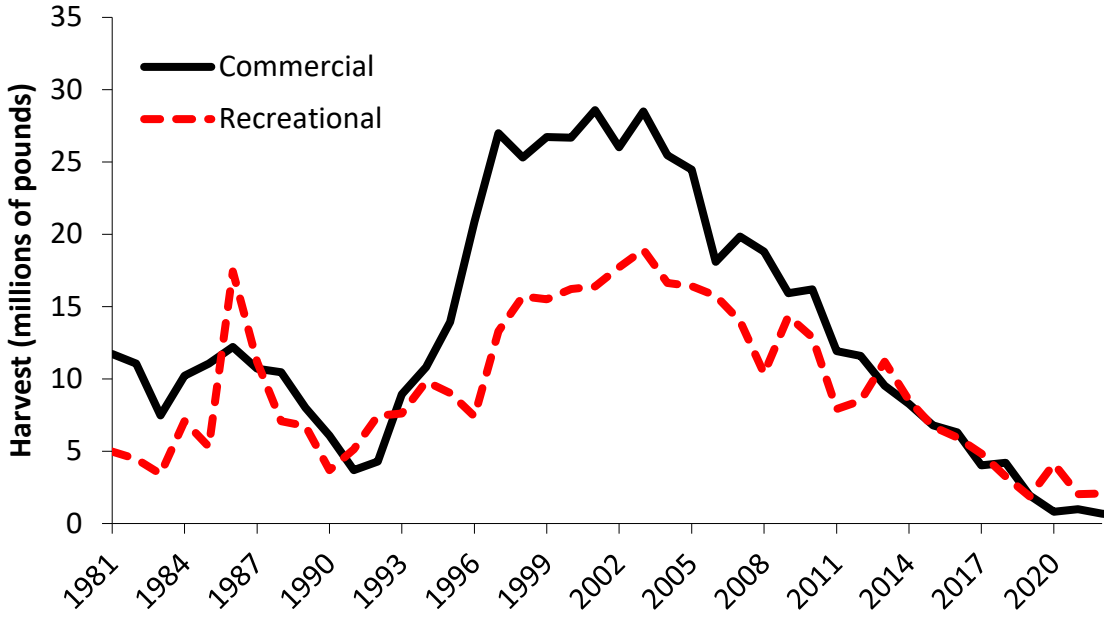


Figure 1. Atlantic croaker commercial and recreational landings (millions of pounds) from 1981-2023. (See Tables 2 and 3 for source information. Commercial landings estimates for 2023 is preliminary. Reliable recreational landings estimates are not available prior to 1981. Recreational landings estimates are based on the mail-based Fishing Effort Survey.)

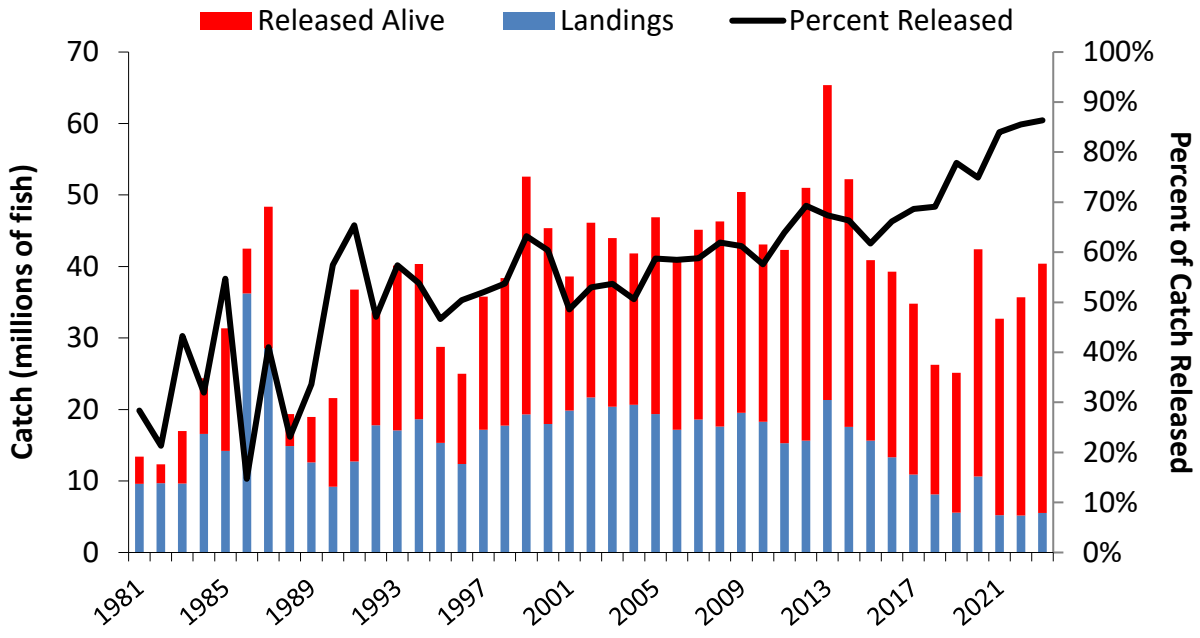


Figure 2. Recreational catch (landings and alive releases, in millions of fish) and the percent of catch that is released, 1981-2023, based on the mail-based Fishing Effort Survey calibration. (See Tables 4 and 5 for values and source information.)

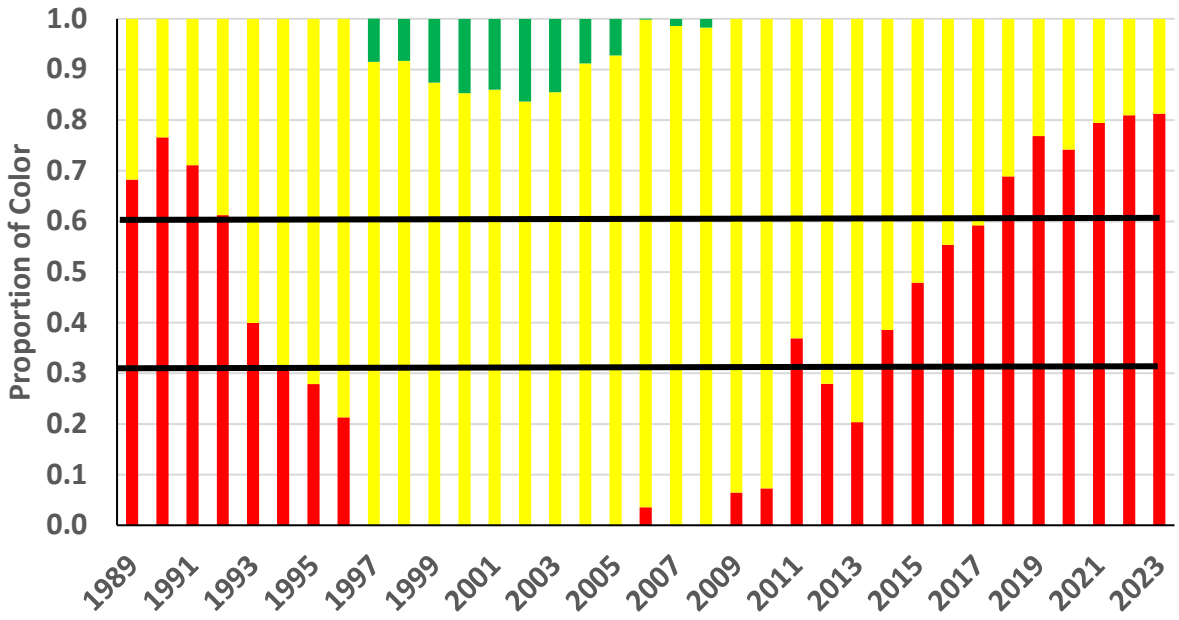


Figure 3. Annual TLA for Atlantic croaker harvest composite (commercial and recreational landings) in the Mid-Atlantic (NJ-VA from 1989-2023 using a 2002-2012 reference period.

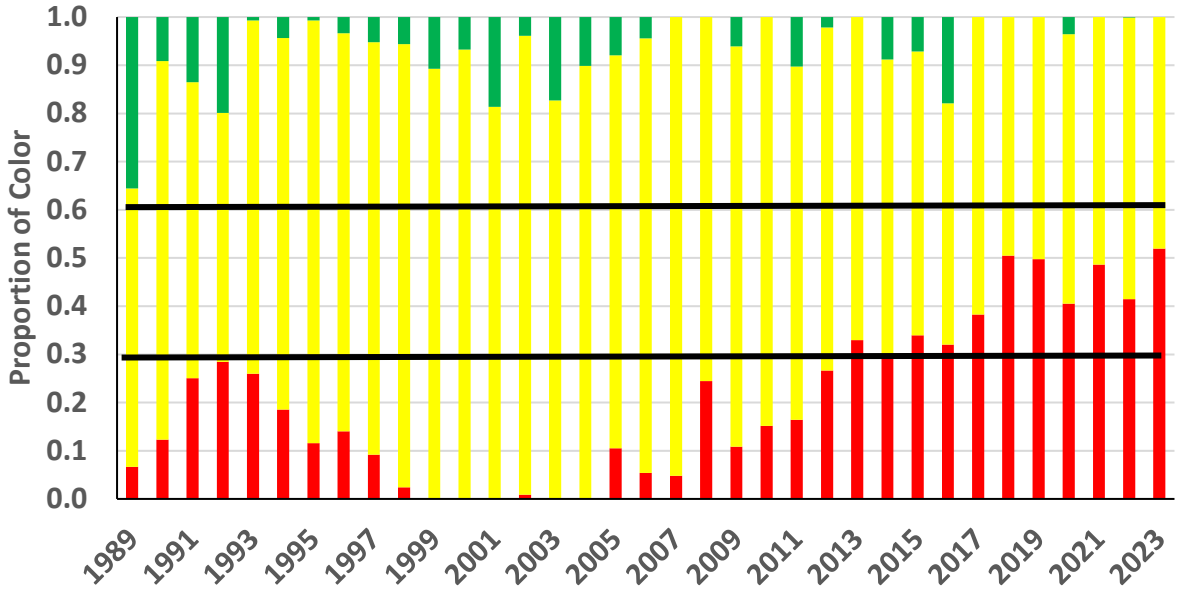


Figure 4. Annual TLA for Atlantic croaker harvest composite (commercial and recreational landings) in the South Atlantic (NC-FL) from 1989-2023 using a 2002-2012 reference period.

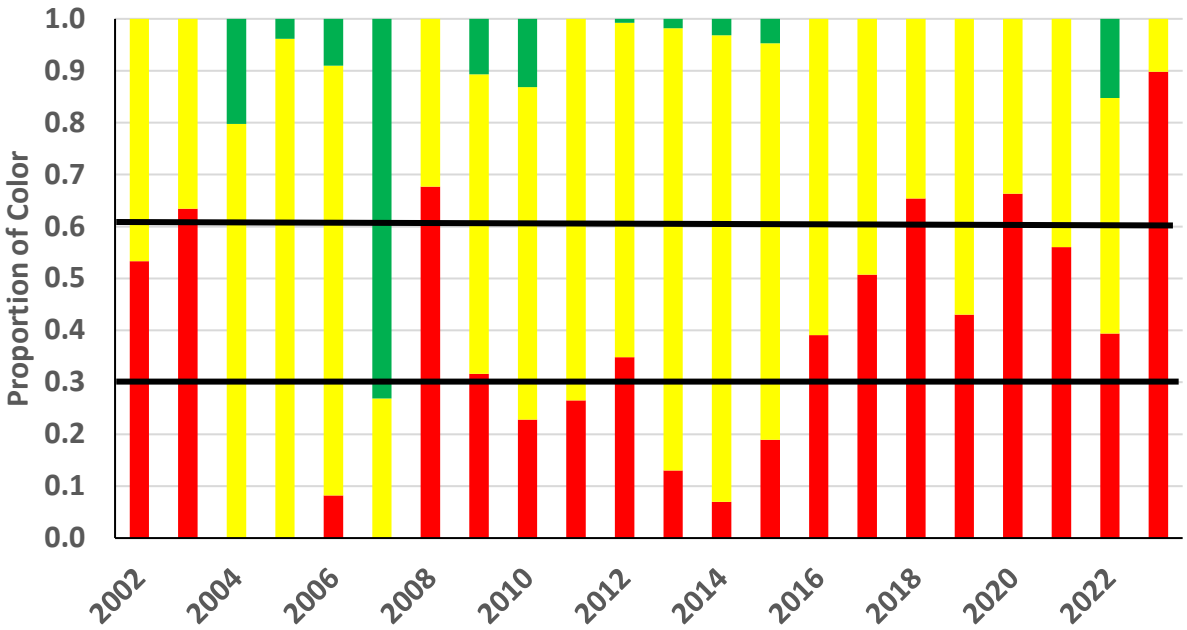


Figure 5. Annual TLA for adult (age 2+) Atlantic croaker composite abundance index in the Mid-Atlantic (NEFSC and ChesMMAP surveys) from 2002-2023 using a 2002-2012 reference period.

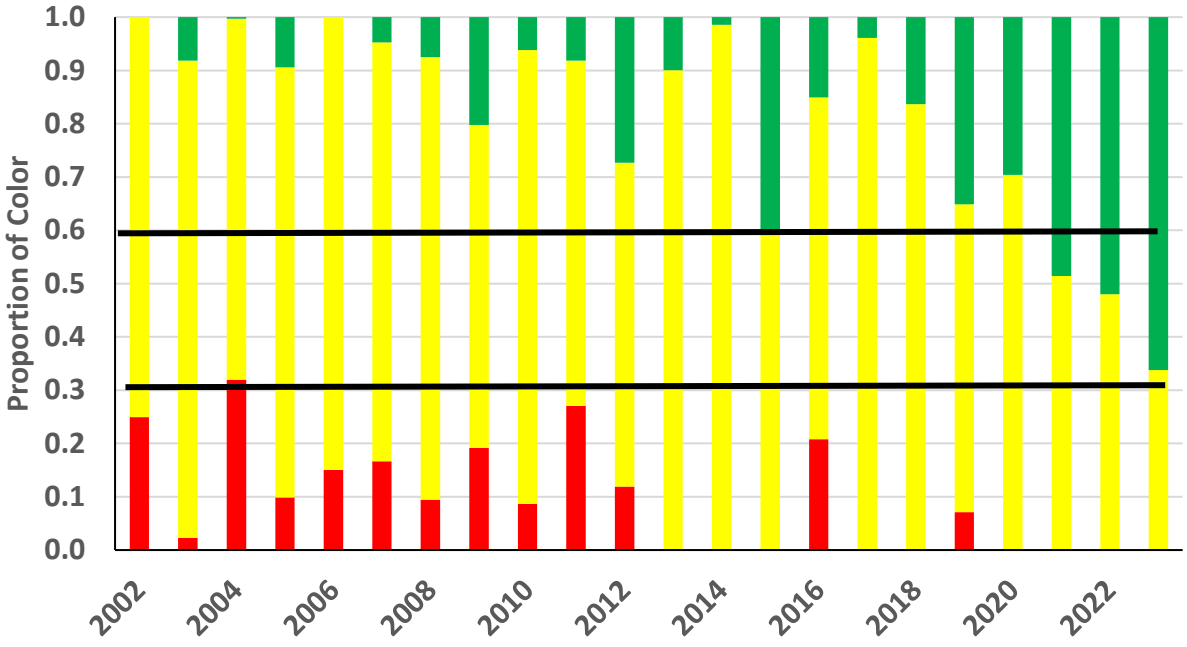


Figure 6. Annual TLA for adult (age 2+) Atlantic croaker composite abundance index in the South Atlantic (SEAMAP and SCDNR trammel survey) from 2002-2023 using a 2002-2012 reference period.

XI.
Tables

Table 1. Summary of state regulations for Atlantic croaker in 2023.

State	Recreational	Commercial
NJ	None	Otter/beam trawl mesh restriction for directed croaker harvest (>100 lbs in possession)
DE	8" minimum; recreational gill nets (up to 200 ft.) with license	8" minimum
MD	9" min, 25 fish/day, charter boat logbooks	9" minimum; open 3/16 to 12/31
PRFC	9” min, 25 fish/day	Open 1/1 to 9/30 (effective 1/1/22) Pound net season: 2/15 to 12/15
VA	50 fish/day, with additional charter live bait allowance (effective 3/23/21)	Open 1/15 to 12/31 (effective 3/23/21)
NC	50 fish/day (effective 4/15/21), recreational use of commercial gears with license and gear restrictions	Open 1/1 to 12/15 (effective 4/15/21)
SC	Mandatory for-hire logbooks, small Sciaenidae species aggregate bag limit of 50 fish/day	None
GA	25 fish/day	25 fish/day limit except for trawlers harvesting shrimp for human consumption (no limit)
FL	50 fish/day (effective 12/1/21)	1,200 commercial vessel limit (effective 12/1/21)

* A commercial fishing license is required to sell croaker in all states with fisheries. For all states, general gear restrictions affect commercial croaker harvest.

Table 2. Commercial harvest (pounds) of Atlantic croaker by state, 2014-2023.
(Estimates for 2023 are preliminary. Sources: 2024 state compliance reports for 2023 fishing year and for years prior to 2023, personal communication with ACCSP, except PRFC [compliance reports only].) Note that Georgia does not have a commercial fishery for Atlantic croaker.

Year	NJ	DE	MD	PRFC	VA	NC	SC	GA	FL	Total
2014	265,166	C	443,661	177,777	4,697,381	2,629,908	C		45,587	C
2015	C	C	294,038	118,996	4,426,957	1,819,007	C		39,096	6,784,146
2016	C	C	101,949	168,889	3,825,737	2,092,287	C		57,538	6,302,799
2017	C	C	42,958	114,319	2,822,005	1,008,015	C		43,033	4,032,993
2018	C	C	44,306	16,561	2,450,984	1,643,646	C		54,409	4,210,715
2019	C	463	2,865	C	595,434	1,278,340	C		68,179	1,945,723
2020	C	C	1,857	601	147,026	570,453	C		84,906	806,781
2021	C	C	4,584	11,430	287,898	540,622	C		124,642	972,121
2022	C	773	3,944	C	193,161	357,312	C		117,958	684,464
2023	9,981	C	C	C	134,392	249,390	C		101,450	505,828

C: Confidential data

Table 3. Recreational harvest (pounds) of Atlantic croaker by state, 2014-2023. (Sources: 2024 state compliance reports for 2023 fishing year and for years prior to 2023, personal communication with MRIP)

Year	NJ	DE	MD	VA	NC	SC	GA	FL	Total
2014	750,580	427,615	1,265,217	4,354,046	758,751	104,434	138,423	712,090	8,511,554
2015	263,749	189,320	871,596	3,514,410	557,735	181,909	248,431	881,185	6,708,335
2016	7,133	10,959	407,010	2,998,022	443,728	81,896	116,313	1,893,203	5,958,264
2017	0	26,441	238,659	3,383,057	237,160	310,621	100,565	555,389	4,851,892
2018	34,125	5,859	191,854	2,245,518	164,644	81,251	83,258	445,663	3,252,172
2019	973	23,973	38,895	995,491	224,337	133,227	97,791	358,941	1,873,628
2020	16,358	21,870	91,047	2,410,612	223,685	230,205	77,876	1,072,714	4,144,367
2021	7,079	35,746	69,744	823,319	376,121	173,526	95,031	461,048	2,041,614
2022	33,048	22,483	21,043	554,254	481,721	240,275	152,231	577,555	2,082,610
2023	31,709	42,567	40,788	499,010	201,056	313,242	116,558	584,977	1,829,907

Table 4. Recreational harvest (numbers) of Atlantic croaker by state, 2014-2023. (Sources: 2024 State compliance reports for 2023 fishing year and for years prior to 2023, personal communication with MRIP)

Year	NJ	DE	MD	VA	NC	SC	GA	FL	Total
2014	852,733	806,256	2,197,125	9,533,829	1,935,961	600,482	289,781	1,359,207	17,576,096
2015	339,021	334,676	1,738,576	8,024,381	1,437,019	555,263	790,014	2,429,723	15,648,673
2016	8,236	24,546	659,318	7,276,719	1,109,570	268,470	402,254	3,553,777	13,302,890
2017	0	65,606	423,790	7,644,516	666,930	765,227	371,301	969,146	10,906,516
2018	104,321	12,370	305,469	5,472,329	472,917	335,833	241,382	1,176,999	8,121,620
2019	3,031	53,048	69,771	3,055,510	651,268	593,475	332,073	801,751	5,559,927
2020	58,097	54,193	244,788	6,529,494	673,377	827,904	232,535	2,010,168	10,630,556
2021	22,722	71,237	174,056	1,862,543	1,066,533	707,924	371,257	952,581	5,228,853
2022	91,584	64,397	55,408	1,969,042	1,110,382	545,062	394,967	942,037	5,172,879
2023	104,481	86,227	151,628	2,364,942	597,690	779,691	535,875	890,684	5,511,218

Table 5. Recreational releases (number) of Atlantic croaker by state, 2014-2023. (Sources: 2024 state compliance reports for 2023 fishing year and for years prior to 2023, personal communication with MRIP)

Year	NJ	DE	MD	VA	NC	SC	GA	FL	Total
2014	703,031	1,396,970	2,806,693	10,314,405	10,347,332	4,742,718	2,057,898	2,265,961	34,635,008
2015	240,840	309,389	1,236,293	6,815,343	9,632,560	3,236,774	1,320,939	2,451,253	25,243,391
2016	139,085	390,655	726,662	6,993,470	7,254,382	5,233,835	1,178,630	4,073,001	25,989,720
2017	152,540	230,455	2,829,255	8,464,305	4,631,445	4,755,853	1,059,539	1,770,846	23,894,238
2018	144,637	85,424	203,081	5,359,179	4,311,368	5,568,892	1,403,560	1,072,381	18,148,522
2019	33,333	101,523	1,243,785	6,642,685	3,634,211	3,768,288	1,893,287	2,259,705	19,576,817
2020	147,494	286,780	2,870,268	6,223,025	5,560,605	12,921,019	1,696,852	2,057,158	31,763,201
2021	116,606	353,743	1,909,466	4,306,221	9,539,047	8,207,074	1,687,801	1,363,075	27,483,033
2022	74,058	467,349	1,537,746	7,193,201	7,914,042	8,359,506	2,056,650	2,901,874	30,504,426
2023	1,380,298	588,623	2,939,081	8,537,665	4,722,440	13,901,122	1,643,243	1,166,700	34,879,172

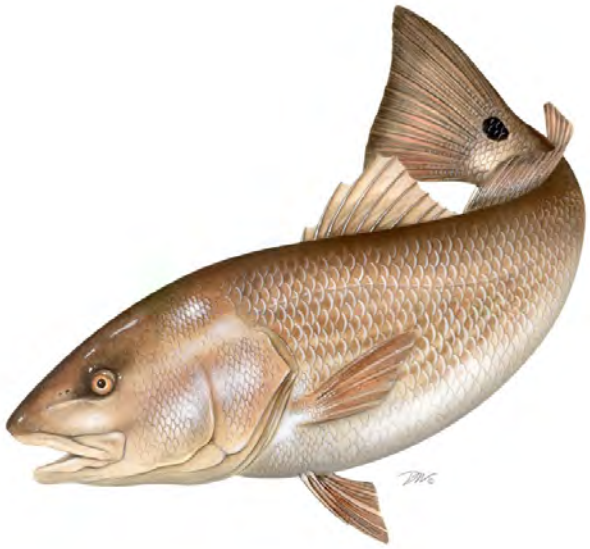
ATLANTIC STATES MARINE FISHERIES COMMISSION

REVIEW OF THE INTERSTATE FISHERY MANAGEMENT PLAN

FOR

RED DRUM
(*Sciaenops ocellatus*)

2023 FISHING YEAR



Prepared by the Plan Review Team
Drafted July 2024

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

Table of Contents

DRAFT FOR BOARD REVIEW

I. Status of the Fishery Management Plan

Date of FMP Approval:	Original FMP – October 1984
Amendments & Addenda:	Amendment 1 – October 1991 Amendment 2 – June 2002 Addendum 1 – August 2013
Management Areas:	The Atlantic coast distribution of the resource from New Jersey through Florida Northern: New Jersey through North Carolina Southern: South Carolina through the east coast of Florida
Active Boards/Committees:	Sciaenids Management Board, Red Drum Technical Committee, Stock Assessment Subcommittee, Plan Development Team, Plan Review Team, South Atlantic Species Advisory Panel

The Atlantic States Marine Fisheries Commission (ASMFC) adopted an Interstate Fishery Management Plan (FMP) for Red Drum in 1984. The original management unit included the states from Maryland to Florida. In 1988, the Interstate Fisheries Management Program (ISFMP) Policy Board requested all Atlantic coastal states from Maine to Florida implement the plan's recommended management regulations to prevent development of northern markets for southern fish. The states of New Jersey through Florida are now required to follow the FMP, while Maine through New York (including Pennsylvania) are encouraged to implement consistent provisions to protect the red drum spawning stock.

In 1990, the South Atlantic Fishery Management Council (Council) adopted an FMP for red drum that defined overfishing and optimum yield (OY) consistent with the Magnuson Fishery Conservation and Management Act of 1976. Adoption of this plan prohibited the harvest of red drum in the exclusive economic zone (EEZ), a moratorium that remains in effect today. Recognizing all harvest would take place in state waters, the Council FMP recommended states implement measures necessary to achieve the target level of at least 30% escapement.

Consequently, ASMFC initiated Amendment 1 in 1991, which included the goal to attain optimum yield from the fishery over time. Optimum yield was defined as the amount of harvest that could be taken while maintaining the level of spawning stock biomass per recruit (SSBR) at or above 30% of the level which would result if fishing mortality was zero. However, a lack of information on adult stock status resulted in the use of a 30% escapement rate of sub-adult red drum to the off-shore adult spawning stock.

Substantial reductions in fishing mortality were necessary to achieve the escapement rate; however, the lack of data on the status of adult red drum along the Atlantic coast led to the adoption of a phase-in approach with a 10% SSBR goal. In 1991, states implemented or maintained harvest controls necessary to attain the goal.

As hoped, these management measures led to increased escapement rates of juvenile red drum. Escapement estimates for the northern region of New Jersey through North Carolina

(18%) and the southern region of South Carolina through Florida (17%) were estimated to be above the 10% phase-in goal, yet still below the ultimate goal of 30% (Vaughan and Carmichael 2000). North Carolina, South Carolina, and Georgia implemented substantive changes to their regulations from 1998-2001 that further restricted harvest.

The Council adopted new definitions of OY and overfishing for red drum in 1998. Optimum yield was redefined as the harvest associated with a 40% static spawning potential ratio (sSPR), overfishing as an sSPR less than 30%, and an overfishing threshold as 10% sSPR. In 1999, the Council recommended management authority for red drum be transferred to the states through the Commission's Interstate Fishery Management Program (ISFMP) process. This was recommended, in part, due to the inability to accurately determine an overfished status, and therefore stock rebuilding targets and schedules, as required under the revised Sustainable Fisheries Act of 1996. The transfer necessitated the development of an amendment to the interstate FMP in order to include the provisions of the Atlantic Coastal Fisheries Cooperative Management Act.

ASFMC adopted Amendment 2 to the Red Drum FMP in June 2002 (ASMFC 2002), which serves as the current management plan. The goal of Amendment 2 is to achieve and maintain the OY for the Atlantic coast red drum fishery as the amount of harvest that can be taken by U.S. fishermen while maintaining the sSPR at or above 40%. There are four plan objectives:

- Achieve and maintain an escapement rate sufficient to prevent recruitment failure and achieve an sSPR at or above 40%.
- Provide a flexible management system to address incompatibility and inconsistency among state and federal regulations which minimizes regulatory delay while retaining substantial ASMFC, Council, and public input into management decisions; and which can adapt to changes in resource abundance, new scientific information, and changes in fishing patterns among user groups or by area.
- Promote cooperative collection of biological, economic, and sociological data required to effectively monitor and assess the status of the red drum resource and evaluate management efforts.
- Restore the age and size structure of the Atlantic coast red drum population.

The management area extends from New Jersey through the east coast of Florida, and is separated into a northern and southern region at the North Carolina/South Carolina border. The sSPR of 40% is considered a target; an sSPR below 30% (threshold level) results in an overfishing determination for red drum. Amendment 2 required all states within the management unit to implement appropriate recreational bag and size limit combinations needed to attain the target sSPR, and to maintain current, or implement more restrictive, commercial fishery regulations. All states were in compliance by January 1, 2003. See Table 1 for state commercial and recreational regulations in 2022.

Following the approval of Amendment 2 in 2002, the process to transfer management authority to ASMFC began, including an Environmental Assessment and public comment period. The final

rule became effective November 5, 2008. It repeals the federal Atlantic Coast Red Drum Fishery Management Plan and transfers management authority of Atlantic red drum in the exclusive economic zone from the South Atlantic Fishery Management Council to the Atlantic States Marine Fisheries Commission.

The Board approved Addendum I to Amendment 2 in August 2013. The Addendum revised the habitat section of Amendment 2 to include current information on red drum spawning habitat and life-stages (egg, larval, juvenile, sub-adult, and adult). It also identified and described the distribution of key habitats and habitats of concern.

II. Status of the Stocks

The 2017 Red Drum Stock Assessment and Peer Review Report indicated overfishing was not occurring for either the northern or southern stock of red drum (ASMFC 2017). The assessment was unable to determine an overfished/not overfished status because population abundance could not be reliably estimated due to limited data for the older fish (ages 4+). A simulation assessment was recently completed, providing a roadmap for future red drum stock assessments through the ASMFC process, with a planned benchmark assessment to follow; all work will be completed by the end of 2024. Results of the 2017 assessment for both the Northern Region and Southern Region are given below.

Northern Region (NJ-NC)

Recruitment (age 1 abundance) has varied annually with a large peak occurring in 2012 (Figure 1). The trend in the three-year average sSPR indicates low sSPR early in the time series with increases during 1991 – 1997 and fluctuations thereafter (Figure 2). The average sSPR has been above the overfishing threshold ($F_{30\%}$) since 1994, and at or above the target ($F_{40\%}$) since 1996, except during one year (2002). Fishing pressure and mortality appear to be stabilized near the target fishing mortality. The average sSPR is also likely above the target benchmark.

Southern Region (SC-FL)

Recruitment (age 1 abundance) has fluctuated without apparent trend since 1991 (Figure 1). A high level of uncertainty exists around the three-year average sSPR estimates for the southern region. While the 3-year average sSPR estimate in 2013 was above both the target ($F_{40\%}$) and the overfishing threshold ($F_{30\%}$), indicating that overfishing is not occurring, the high level of uncertainty around this estimate indicates this conclusion should be considered with extreme caution (Figure 2).

NOTE: In 2018, the Marine Recreational Information Program (MRIP) transitioned from estimating effort using the Coastal Household Telephone Survey (CHTS) to the mail-based Fishing Effort Survey (FES). The 2017 stock assessment used CHTS data to estimate recreational harvest. However, as red drum is not managed by a quota and to accommodate the transition, recreational harvest estimates based on the FES data or calibration are shown in this report. Due to differing estimation methodologies, these harvest data should not be compared to reference points from the 2017 stock assessment.

III. Status of the Fishery

Red drum landings from New Jersey through the east coast of Florida in 2023 are estimated at 5.0 million pounds (Tables 3 and 4; Figure 3). In 2023, 61% of the total landings came from the southern region where the fishery is exclusively recreational, and 39% from the northern region (Figure 4). Since 2019, the northern region averaged 43% of the total harvest and the southern region averaged 57% of the total harvest. This is a significant change from the historic regional landings split (1981-2019), which averaged 76% from the southern region and 24% from the northern region.

Northern Region (NJ-NC)
Red drum landings in the northern region totaled 1.9 million pounds in 2023, a decrease of approximately 24% from the previous year (Tables 3 and 4). There was an increase in commercial landings and a decline in recreational landings. Commercial landings totaled 203,512 pounds or 10% of the combined commercial and recreational harvest in the northern region, with 91% of commercial landings coming from North Carolina (Figure 5). This is a 6% increase in commercial landings from 2022. In North Carolina, a daily commercial trip limit and an annual cap of 250,000 pounds with payback of any overage constrained the commercial harvest. Unique to this state, the red drum fishing year extends from September 1 to August 31. In 2008, the Board approved use of this fishing year to monitor the cap. During the 2022/2023 fishing year, North Carolina landed 189,013 pounds of the 250,000-pound annual landings cap.

Recreational landings in the northern region in 2023 were estimated to be 1.8 million pounds, a decline from the previous year's estimates of recreational harvest at 2.6 million pounds (Table 4). North Carolina is estimated to have 1.1 million pounds of recreational landings, followed by Virginia with 0.6 million pounds. Virginia and North Carolina red drum recreational landings decreased by 23% and 31% from the previous year, respectively. The number of fish harvested in the recreational fishery in 2023 was 387,092 fish, a decline of 22% from 2022 (Table 5). The number of fish released in the northern region, 2.7 million fish, in 2023 declined by 9% from 2022, at 2.9 million fish (Figure 6). It is estimated that 8% of released fish die as a result of being caught, resulting in an estimated 214,818 dead discarded fish in 2023 (Table 6). Recreational removals from the fishery are thus estimated to be 601,910 fish in 2023 (Figure 6 and 7).

Southern Region (SC-FL)
The southern region had no commercial landings; Florida commercial harvest has been prohibited since January 1988. South Carolina and Georgia designated red drum as a gamefish, banning commercial harvest and sale since 1987 and 2013, respectively.

Recreational landings in the southern region in 2023 were estimated to be 3.0 million pounds, a 7% decline from 2022 (Table 4). Florida is estimated to have 1.5 million pounds of recreational landings, followed by Georgia with 0.8 million pounds, and South Carolina with 0.7 million pounds. While recreational landings in Florida in 2023 were similar to 2022, recreational landings in Georgia and South Carolina declined by 24% and 18%, respectively. The number of fish harvested in the recreational fishery in 2023 was 1.0 million fish, which was a slight decline

from recreational harvest in 2022 (1.2 million fish; Table 4). The number of fish released in the southern region in 2023 was 8.5 million fish, which was an increase of 17% from 2022 when 7.3 million fish were released (Figure 6). It is estimated that 8% of released fish die as a result of being caught, resulting in an estimated 682,563 dead discarded fish in 2023 (Table 6). Recreational removals from the fishery are thus estimated to be 1.7 million fish in 2023 (Figure 6 & 7).

IV. Status of Assessment Advice

Current stock status information comes from the 2017 stock assessment (ASMFC 2017) completed by the ASMFC Red Drum Stock Assessment Subcommittee (SAS) and Technical Committee (TC), peer reviewed by an independent panel of experts through ASMFC's desk review process, and approved by the South Atlantic State-Federal Fisheries Management Board for use in management decisions. The approved base model from this assessment is a statistical catch-at-age model. Previous interstate management decisions were based on the last coastwide assessment, SEDAR 18 (SAFMC 2009), and prior to 2009, decisions were based on regional assessments conducted by Vaughan and Helser (1990), Vaughan (1992, 1993, 1996), and Vaughan and Carmichael (2000) that reflected the current stock structure, two stocks divided at the North Carolina-South Carolina border. Several states have also conducted state-specific assessments (e.g., Murphy and Munyandorero 2009; Takade and Paramore 2007 [update of Vaughan and Carmichael 2000]).

In 2017, a state-specific stock assessment was completed by South Carolina, which indicated the South Carolina population of red drum was experiencing overfishing (Murphy 2017). This assessment result prompted new state management regulations, which went into effect on July 1, 2018 (Table 1).

In 2020, Florida completed a stock assessment for red drum in Florida state waters, and found the Atlantic Coast red drum stock was not overfished and overfishing was not occurring (Addis 2020). The northeast region (Flagler through Nassau counties) exceeded the Commission's target escapement rate of 40%. The formally defined southeast region (Miami-Dade-Volusia counties) exceeded the escapement rate in the terminal year (2019), but does not meet the current escapement rate target. Overall, the state of Florida has an escapement rate higher than the Commission's goal of 40%.

At the Winter meeting of ASMFC in 2019, the Board reviewed a proposal from the SAS that recommended a population simulation model be developed to simulate the full red drum population. The simulated population would be used to test a variety of assessment modeling techniques to determine which model would be the most applicable for the next benchmark stock assessment. Due to the work and modeling expertise needed for the simulation assessment, the benchmark assessment was postponed until 2024. The Red Drum Simulation Assessment and Peer Review Report was accepted by the Board at their May 2022 meeting. The Peer Review Panel recommended the Stock Synthesis model should be used to assess the northern (from New Jersey – North Carolina) and southern (from South Carolina – Florida) red drum stocks, while the statistical catch-at-age model should not be used. The Panel also

recommended using a traffic light approach to monitor changes in landings and stock abundance in between assessments. A new benchmark assessment for red drum is currently in progress and is scheduled to be complete in Fall 2024.

V. Status of Research and Monitoring

No monitoring or research programs are annually required of the states except for the submission of a compliance report. Fishery-dependent (other than catch and effort data) monitoring programs are conducted from Maryland to Florida, with biological and sportfish carcass recovery programs collecting age, length, and sex data. Virginia, North Carolina, and South Carolina also conduct sportfish tagging programs. Fishery-independent monitoring programs that directly target or may encounter red drum are conducted in New Jersey, Delaware, North Carolina, South Carolina, Georgia, and Florida. Data collected includes CPUE, biological data, YOY indices, and mark-recapture data. See Table 2 for details on the fishery independent indices and ongoing surveys.

VI. Status of Management Measures and Issues

Fishery Management Plan

Amendment 2 was fully implemented by January 1, 2003, providing the management requirements for 2022. Requirements include: recreational regulations designed to achieve at least 40% sSPR, a maximum size limit of 27 inches or less, and current or more stringent commercial regulations. States are also required to have in place law enforcement capabilities adequate to successfully implement their red drum regulations. In August 2013, the Board approved Addendum I to Amendment 2 of the Red Drum FMP. The Addendum revises the habitat section of Amendment 2 to include the most current information on red drum spawning habitat for each life stage (egg, larval, juvenile, sub-adult, and adult). It also identifies the distribution of key habitats and habitats of concern, including potential threats and bottlenecks.

De Minimis Requests

New Jersey and Delaware requested *de minimis* status through the annual reporting process. While Amendment 2 does not include a specific method to determine whether a state qualifies for *de minimis*, the PRT chose to evaluate an individual state's contribution to the fishery by comparing the two-year average of total landings of the state to that of the management unit. New Jersey and Delaware each harvested zero percent of the two-year average of total landings. *De minimis* status does not exempt either state from any requirement; it may exempt them from future management measures implemented through addenda to Amendment 2, as determined by the Board.

VII. Implementation of FMP Compliance Requirements for 2023

The PRT found no inconsistences between state compliance reports and the requirements of Amendment 2.

VIII. Recommendations of the Plan Review Team

<u>Management and Regulatory Recommendations</u>

Consider approval of the *de minimis* requests by New Jersey and Delaware.

Research Recommendations

Additional research recommendations can be found in the most recent stock assessment found here and the 2022 Simulation Assessment and peer review report here. The PRT had the additional research recommendations:

- Implement surveys (e.g., logbooks, electronic methods, etc.) to determine the length composition (and age data, if possible) of recreational discards (B2) of red drum. This information has been highlighted as the single largest data gap in previous assessments.

- Continue sampling of adult red drum surveys to determine abundance, size, age, sex composition, and maturity of the adults. Additionally, investigate the possibility of senescence in female red drum. Investigate how targeting of adult red drum spawning and post-spawning aggregations via catch-and-release hook-and-line fisheries by anglers is affecting the reproductive potential of the stock due to both direct lethal and sub-lethal effects.

- Assess the effects of environmental factors and habitat loss on stock density/year class strength. Determine whether natural environmental perturbations and habitat loss affect recruitment and modify relationships with spawning stock size.

- Support and conduct applied research to evaluate the social and economic value of this important, primarily recreational fishery. Accomplishing this includes continued support of the Marine Recreational Fishing Expenditures Survey that is conducted every three to five years by NOAA Fisheries as well as conducting applied research on projecting social and/or economic estimated impacts associated with this fishery.

IX. References

Addis, D. 2020. The 2020 stock assessment of Red Drum, *Sciaenops ocellatus*, in Florida. Florida Fish and Wildlife Conservation Commission Fish and Wildlife Research Institute In-House Report IHR2020-002: 129 p.

Atlantic States Marine Fisheries Commission (ASMFC). 2002. Amendment 2 to the Interstate Fishery Management Plan for Red Drum. ASMFC, Washington, DC, Fishery Management Report No. 38, 141 p.

ASMFC. 2017. Red Drum Stock Assessment and Peer Review Report. Atlantic States Marine Fisheries Commission, Stock Assessment Report, 126 p.

ASMFC. 2022. Red Drum Simulation Assessment and Peer Review Report. Atlantic States Marine Fisheries Commission, Stock Assessment Report, 567 p.

Murphy, MD. 2017. An assessment of red drum in South Carolina, 1982-2016. South Carolina Department of Natural Resources Marine Resources Research Institute, In House Report 2017, 46 p.

Murphy, MD and J. Munyandorero. 2009. An assessment of the status of red drum in Florida through 2007. Florida Fish and Wildlife Commission Fish and Wildlife Research Institute, St. Petersburg, In-House Report 2008-008, 106 p.

South Atlantic Fishery Management Council (SAFMC). 2009. Southeast Data, Assessment and Review 18, Stock Assessment Report, Atlantic Red Drum. North Charleston, SC. 544 p.

Takade, H and L Paramore. 2007. Stock Status of the Northern Red Drum Stock. North Carolina Division of Marine Fisheries. In-House Report, 60 p.

Vaughan, DS. 1992. Status of the red drum stock of the Atlantic coast: Stock assessment report for 1991. NOAA Tech. Mem. NMFS-SEFC-297. 58 p.

Vaughan, DS. 1993. Status of the red drum stock of the Atlantic coast: Stock assessment report for 1992. NOAA Tech. Mem. NMFS-SEFC-313. 60 p.

Vaughan, DS. 1996. Status of the red drum stock of the Atlantic coast: Stock assessment report for 1995. NOAA Tech. Mem. NMFS-SEFC-380. 50 p.

Vaughan, DS and JT Carmichael. 2000. Assessment of Atlantic red drum for 1999: northern and southern regions. NOAA Tech. Mem. NMFS-SEFSC-447, 54 p. + app. U.S. DOC, NOAA, Center for Coastal Fisheries and Habitat Research, Beaufort, NC.

Vaughan, DS and JT Carmichael. 2001. Bag and size limit analyses for red drum in northern and southern regions of the U.S. South Atlantic. NOAA Tech. Mem. NMFS-SEFSC-454, 37 p. U.S. DOC, NOAA, Center for Coastal Fisheries and Habitat Research, Beaufort, NC.

Vaughan, DS and TE Helser. 1990. Status of the red drum stock of the Atlantic coast: Stock assessment report for 1989. NOAA Tech. Mem. NMFS-SEFC-263. 117 p.

X. Figures

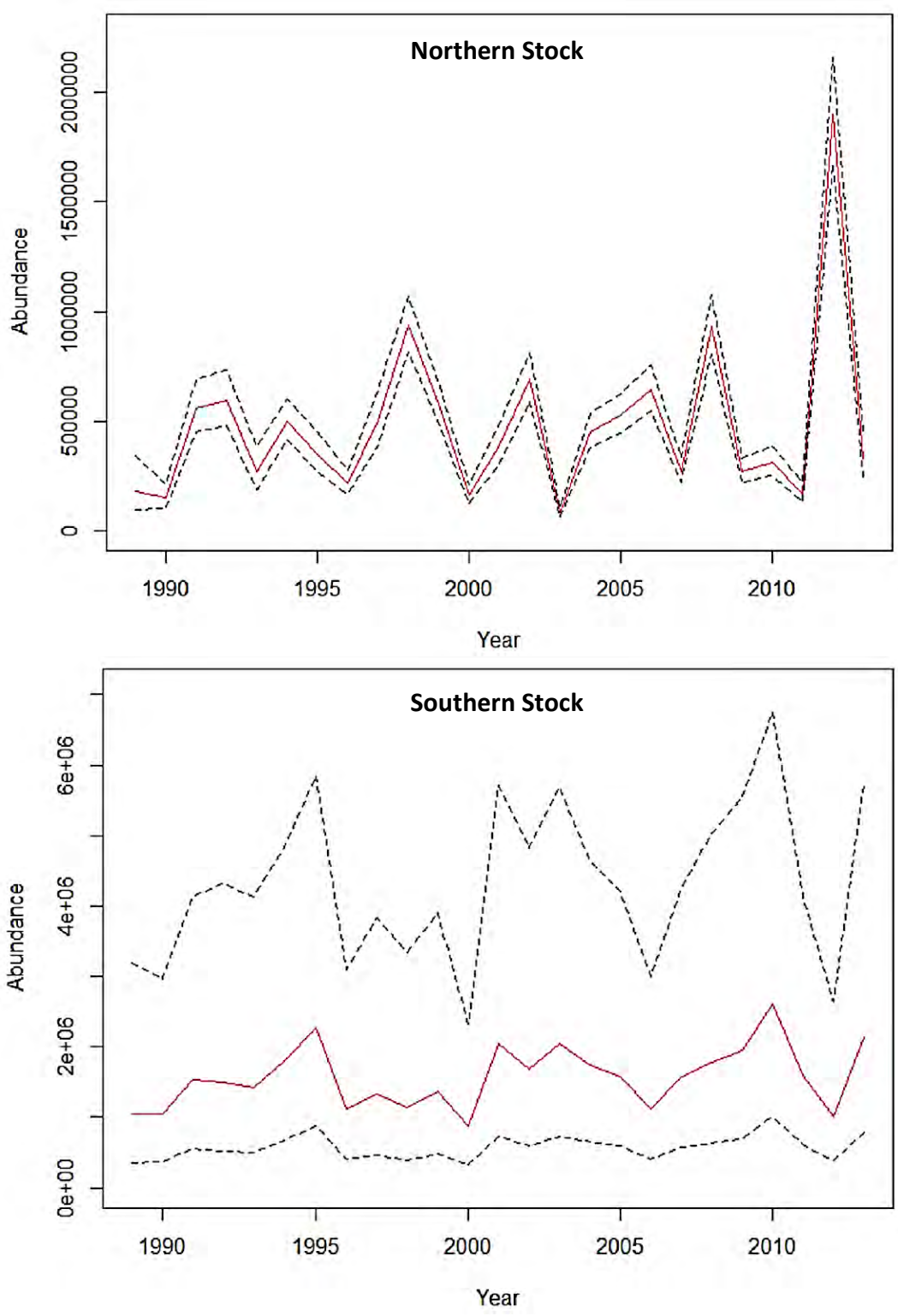


Figure 1. Predicted recruitment (age-1 abundance, red lines) with 95% confidence intervals (dashed black lines) for the northern (top) and southern (bottom) regions (Source: ASMFC 2017).

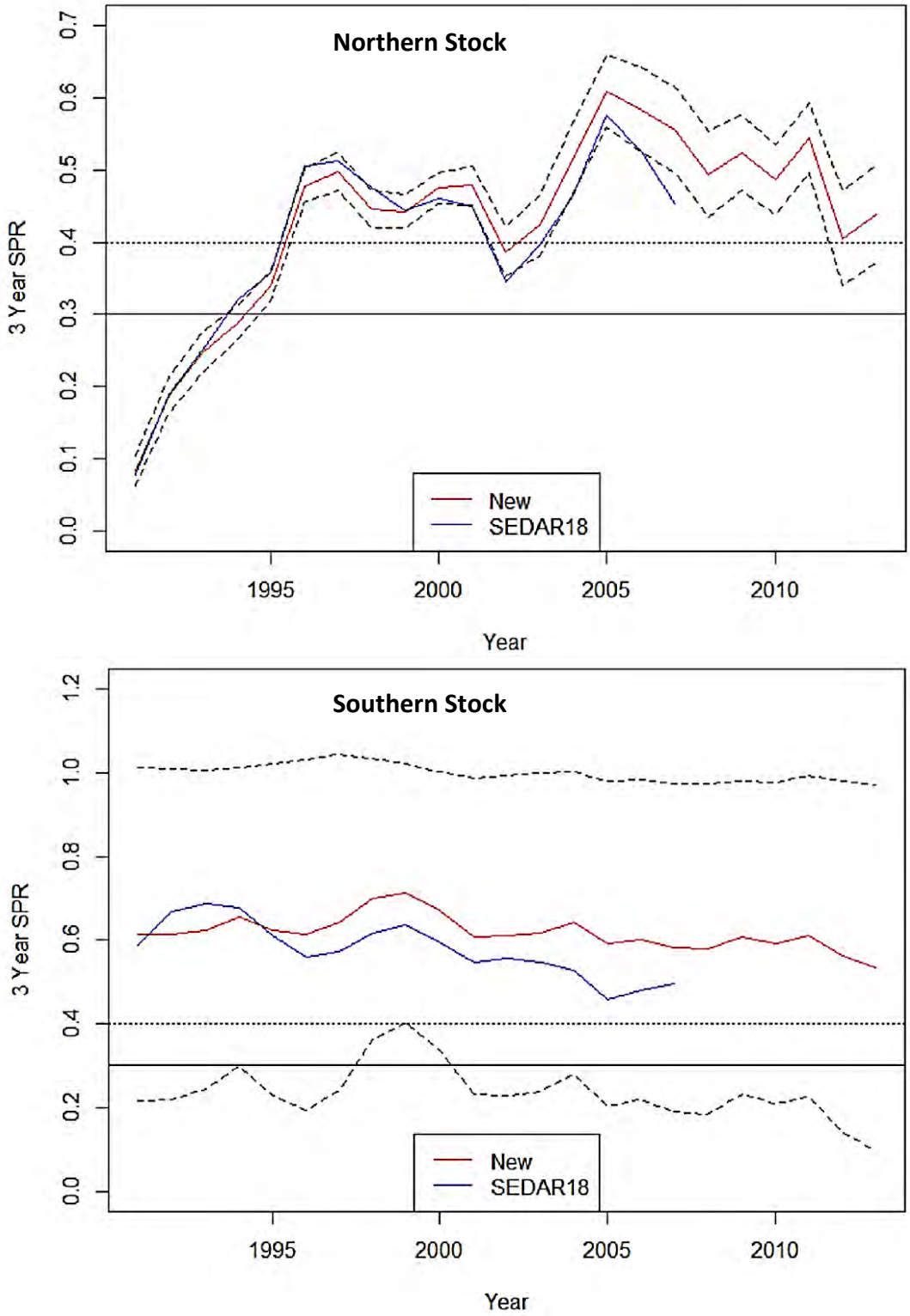


Figure 2. Three-year average sSPR (red lines) for the northern (top) and southern (bottom) stocks with 95% confidence intervals (dashed black lines). Point estimates from the previous benchmark assessment (SEDAR18) are included for comparison. The target sSPR (dotted black line) is 40% and the threshold sSPR (solid black line) is 30% (Source: ASMFC 2017)**.**

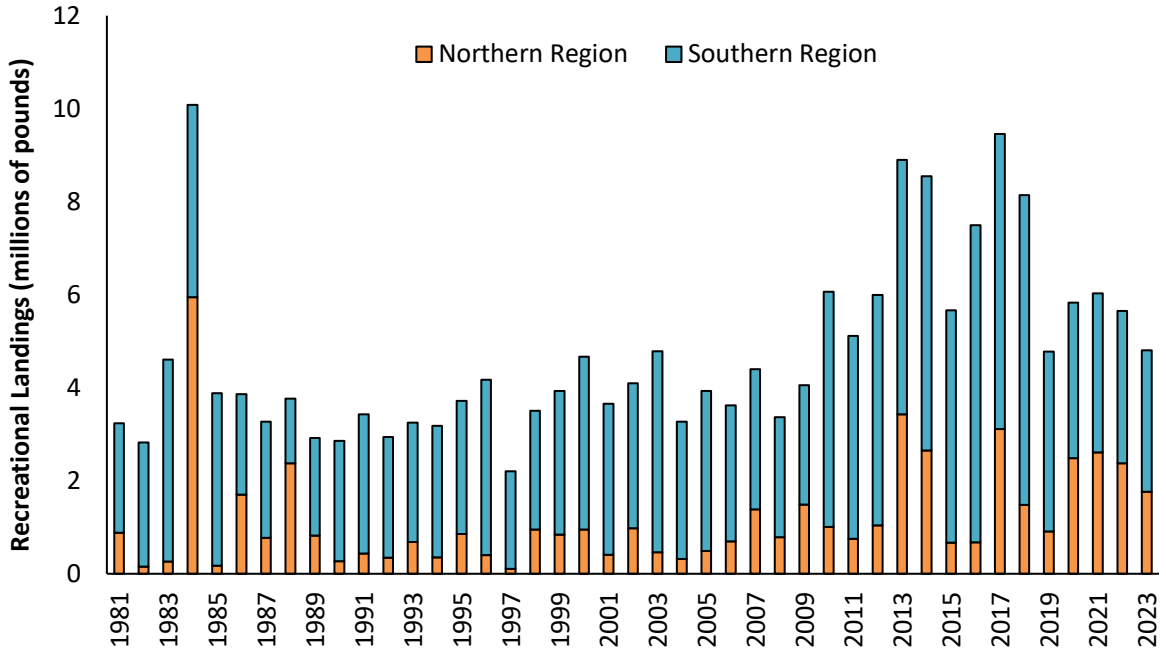


Figure 3. Recreational landings of red drum by region (1981-2023). See Table 4 for values and data sources.

*Recreational weight data for NC-FL in 1988 is unavailable. Recreational harvests in pounds were estimated for these states in this year by multiplying each state's 1988 harvest in numbers of fish by its time series average weight.

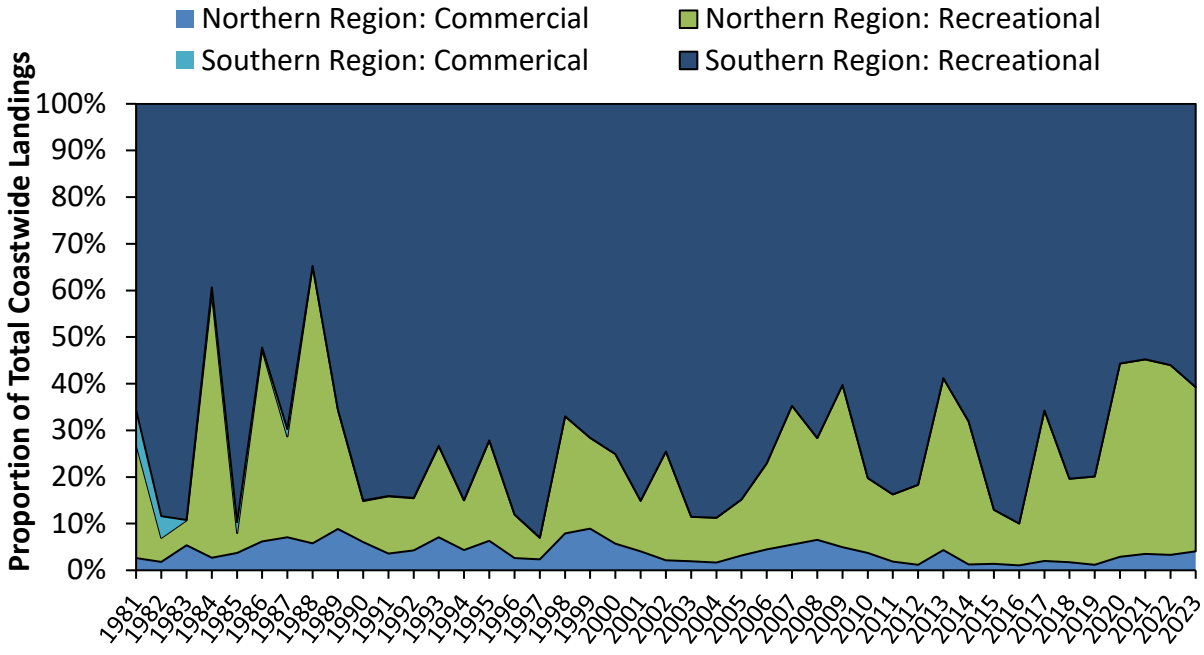


Figure 4. Proportion of regional, sector-specific landings to total coastwide landings (pounds) from 1981-2023. See Tables 3 and 4 for data sources.

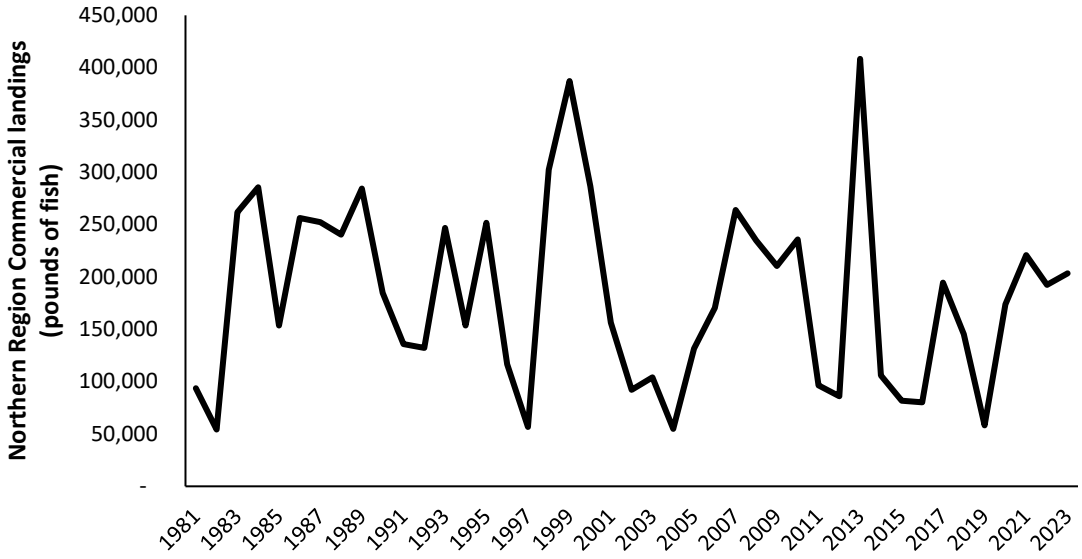


Figure 5. Commercial landings of red drum from the Northern Region (1981-2023). See Table 3 for values and data sources.

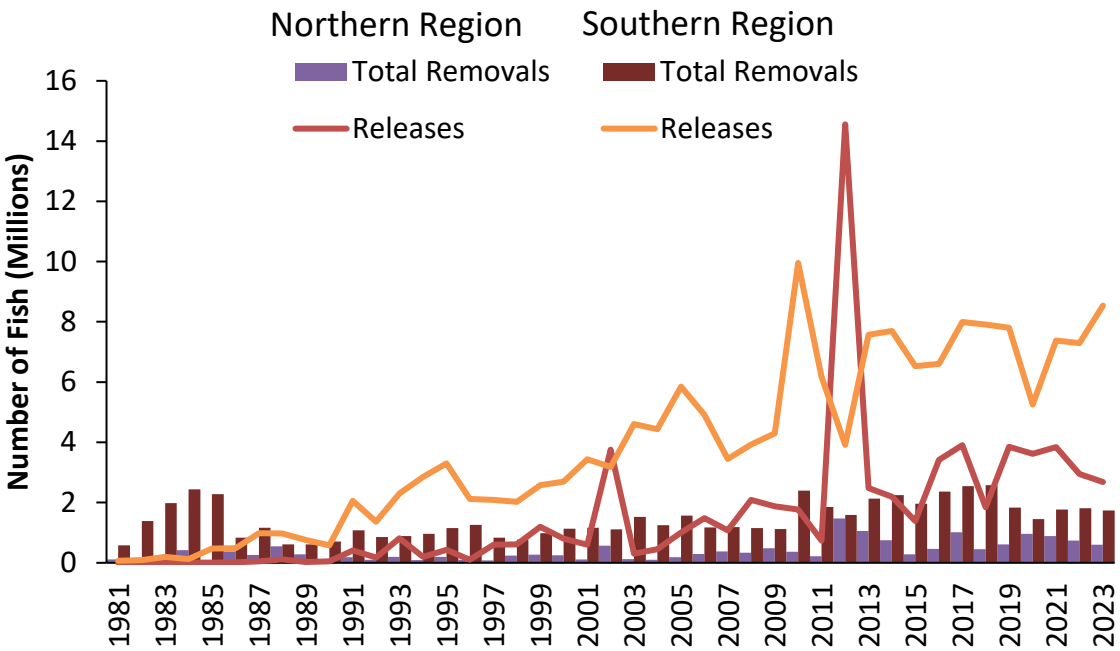


Figure 6. Total recreational removals (numbers) compared to recreational releases of red drum (numbers) for 1981-2023. See Tables 5 and 6 for values and data sources.

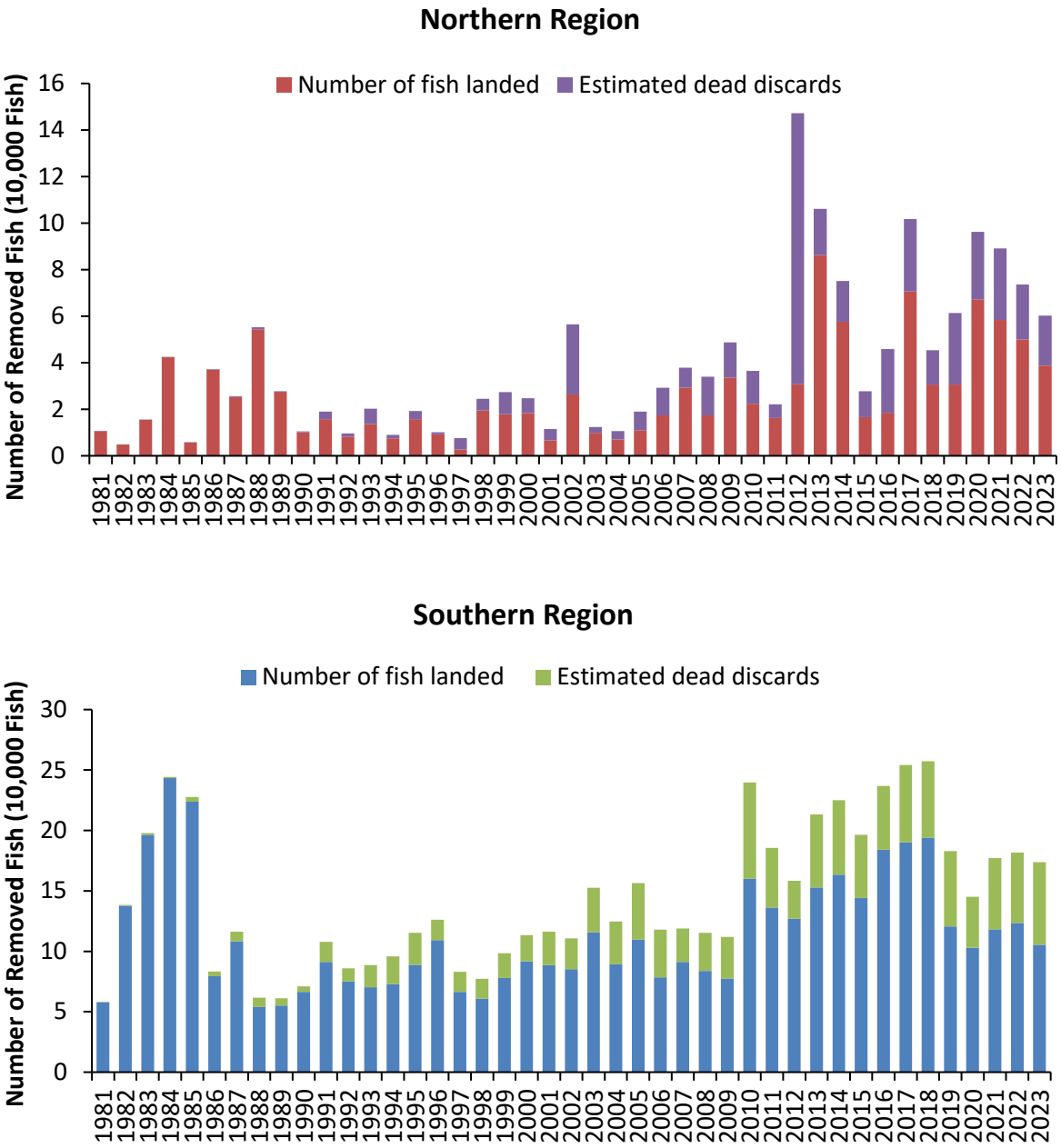


Figure 7. Recreational removals (landings and dead discards) of red drum (numbers) by region from 1981-2023. Dead discards are estimated by applying an 8% discard mortality rate to alive releases. See Tables 5 & 6 for values and data sources.

XI. Tables

Table 1. Red drum regulations for 2023. The states of New Jersey through Florida are required to meet the requirements in the FMP; states north of New Jersey are encouraged to follow the regulations. All size limits are total length.

State	Recreational	Commercial
NJ	18" - 27", 1 fish	18" - 27", 1 fish
DE	20" - 27", 5 fish	20" - 27", 5 fish
MD	18" - 27", 1 fish	18" - 25", 5 fish
PRFC	18" - 25", 5 fish	18" - 25", 5 fish
VA	18" - 26", 3 fish	18" - 25", 5 fish
NC	18" - 27", 1 fish	18" - 27"; 250,000 lbs harvest cap with overage payback (150,000 lbs Sept 1- April 30; 100,000 lbs May 1-Aug 31); harvest of red drum allowed with 7 fish daily trip limit; daily landed catch of flounder, bluefish, black drum or striped mullet must exceed daily catch of drum; small mesh (<5" stretched mesh) gill nets attendance requirement May 1 - November 30. Fishing year: September 1 – August 31.
SC	15" - 23", 2 fish per person per day bag limit and 6 fish per boat per day boat limit	Gamefish Only
GA	14" - 23", 5 fish	Gamefish Only
FL	18" - 27"; Northeast Region – 1 fish per person per day, 4 fish vessel limit; Indian River Lagoon Region – 0 fish per person per day, 0 vessel limit; Southeast Region – 1 fish per person per day, 2 fish vessel limit (effective September 1, 2022).	Sale of native fish prohibited

Table 2. Overview of each state's fishery independent surveys.

State	Fishery Independent Monitoring Details
New Jersey	Five annual nearshore trawl surveys conducted since 1988, in January/February, April, June, August, and October. Length and weight data, and catch per unit effort (CPUE) in number of fish per tow and biomass per tow recorded for all species.
Delaware	30-ft bottom trawl survey and 16-ft bottom trawl survey. Neither survey has ever captured red drum.
North Carolina	Seine survey since 1991 produces age-0 abundance index. Gill net survey in Pamlico Sound since 2001 characterizes size and age distribution, produces abundance index, improves bycatch estimates, and studies habitat usage. Longline survey since 2007 produces adult index of abundance and tags fish.
South Carolina	Estuarine trammel net survey for subadults. Electrofishing survey in low salinity estuarine areas for juveniles/subadults. Inshore and coastal bottom longline survey for biological data and adult abundance index. Genetic sub-sampling and tagging conducted during these three surveys.
Georgia	Estuarine trammel net survey for subadult biological data and abundance index. Estuarine gill net survey for young-of-year (YOY) biological data and abundance index. Bottom longline survey for adult biological data and abundance index.
Florida	Seine surveys characterizing young-of-year (YOY) (<40 mm standard length) and sub-adult (>299 mm) abundance along the northeast (NE) and southeast (SE) Florida coasts.

Table 3. Commercial landings (pounds) of red drum by state, 2014-2023. (Source: personal communication with ACCSP, for years prior to 2022 and state compliance reports for 2022, except as noted below.) Note that SC, GA, and FL do not have commercial red drum fisheries, and years with incidental landings are included in the total.

Year	NJ to PRFC	VA	NC	Total
2014	353	14,733	90,647	105,732
2015	421	814	80,282	81,516
2016	197	1,898	77,833	79,927
2017	644	6,971	186,411	194,032
2018	C	885	144,464	145,500
2019	32	1,650	56,393	58,107
2020	104	7,989	165,670	173,867
2021	217	19,584	200,825	220,843
2022	57	17,411	175,029	192,554
2023	C	16,899	186,414	204,500

*C indicates confidential landings, and totals have been rounded to protect confidentiality.

Table 4. Recreational landings (pounds) of red drum by state, 2014-2023. (Source: personal communication with MRIP for data prior to 2023; state compliance reports for 2023)

Year	NJ	DE	MD	VA	NC	Northern Region Total
2014				979,388	1,674,595	2,653,983
2015				98,329	567,730	666,059
2016				45,451	633,496	678,947
2017			6,782	1,628,692	1,475,852	3,111,326
2018				31,566	1,452,358	1,483,924
2019	4,107		2,113	470,940	436,219	913,379
2020		1,544	115,181	610,001	1,758,789	2,485,515
2021			5,441	1,123,953	1,479,550	2,608,944
2022				762,729	1,615,108	2,377,837
2023			53,253	588,763	1,120,661	1,762,677

Year		SC	GA	FL	Southern Region Total
2014		921,971	387,367	4,582,561	5,891,899
2015		656,747	394,787	3,949,000	5,000,534
2016		536,550	586,235	5,694,370	6,817,155
2017		1,048,249	826,857	4,470,905	6,346,011
2018		643,213	1,186,306	4,829,344	6,658,863
2019		862,124	630,294	2,372,773	3,865,191
2020		671,004	535,674	2,135,395	3,342,073
2021		441,191	506,962	2,473,995	3,422,148
2022		584,289	1,081,410	1,605,556	3,271,255
2023		688,722	826,719	1,527,754	3,043,195

Table 5. Recreational landings (numbers) of red drum by state, 2014-2023. (Source: personal communication with MRIP for data prior to 2023; state compliance reports for 2023)

Year	NJ	DE	MD	VA	NC	Northern Total
2014				251,501	324,303	575,804
2015				22,102	143,876	165,978
2016				15,866	169,195	185,061
2017			4,943	347,145	353,716	705,804
2018				6,334	299,577	305,911
2019	1,331		1,258	205,824	97,186	305,599
2020		493	44,975	214,069	413,419	672,956
2021			1,415	256,281	325,662	583,358
2022				163,962	336,280	500,242
2023			17,896	137,063	232,133	387,092

Year		SC	GA	FL	Southern Total
2014		393,424	212,193	1,027,980	1,633,597
2015		258,493	201,049	981,685	1,441,227
2016		241,224	289,928	1,309,505	1,840,657
2017		455,887	467,522	978,520	1,901,929
2018		262,725	606,836	1,069,604	1,939,165
2019		333,315	271,970	599,348	1,204,633
2020		239,874	230,026	560,382	1,030,282
2021		210,454	261,488	710,091	1,182,033
2022		219,659	607,512	406,391	1,233,562
2023		280,527	366,498	407,618	1,054,643

Table 6. Recreational alive releases (numbers) of red drum by state, 2014-2023. (Source: personal communication with MRIP for data prior to 2023; state compliance reports for 2023)

Year	NJ	DE	MD	VA	NC	Northern Region Total	Northern Region Dead Discards
2014		264	659	1,108,646	1,086,967	2,196,536	175,723
2015			1,456	78,590	1,308,072	1,388,118	111,049
2016		2,598	47,908	164,575	3,203,452	3,418,533	273,483
2017			14,148	1,722,618	2,165,656	3,902,422	312,194
2018	4,715		21,384	85,338	1,729,260	1,840,697	147,256
2019		474	5,740	865,957	2,976,601	3,848,772	307,902
2020			217,710	716,277	2,686,150	3,620,137	289,611
2021		1,147	22,218	1,272,609	2,545,371	3,841,345	307,308
2022		2,116	18,010	770,731	2,160,742	2,951,599	236,128
2023	881	595	98,500	1,145,885	1,439,370	2,684,350	214,748

Year		SC	GA	FL	Southern Region Total	Southern Region Dead Discards
2014		1,874,809	750,619	5,074,602	7,700,030	616,002
2015		1,432,754	961,277	4,132,461	6,526,492	522,119
2016		1,266,931	601,153	4,734,303	6,602,387	528,191
2017		2,094,199	1,176,524	4,727,411	7,998,134	639,851
2018		1,493,803	1,045,570	5,375,011	7,914,384	633,151
2019		2,911,653	1,206,707	3,688,884	7,807,244	624,580
2020		1,705,054	393,368	3,154,500	5,252,922	420,234
2021		1,894,088	794,030	4,689,059	7,377,177	590,174
2022		1,289,714	1,814,251	4,188,940	7,292,905	583,432
2023		2,320,184	1,450,988	4,760,870	8,532,042	682,563

Atlantic States Marine Fisheries Commission

Coastal Pelagics Management Board

August 7, 2024
1:30 – 4:00 p.m.

Draft Agenda

The times listed are approximate; the order in which these items will be taken is subject to change; other items may be added as necessary.

1.	Welcome/Call to Order *(S. Woodward)*	1:30 p.m.
2.	Board Consent • Approval of Agenda • Approval of Proceedings from May 2024	1:30 p.m.
3.	Public Comment	1:35 p.m.
4.	Consider Approval of Atlantic Cobia Fishery Management Plan Review and State Compliance for the 2023 Fishing Year *(E. Franke)* **Action**	1:45 p.m.
5.	Consider Atlantic Cobia Addendum II on Recreational Allocation, Harvest Target Evaluation, and Measures Setting for Final Approval **Final Action** • Review Options and Public Comment Summary *(E. Franke)* • Advisory Panel Report *(E. Franke)* • Consider Final Approval of Addendum II	2:00 p.m.
6.	Update from South Atlantic Fishery Management Council on Mackerel Port Meetings *(J. Carmichael)*	3:50 p.m.
7.	Other Business/Adjourn	4:00 p.m.

The meeting will be held at The Westin Crystal City (1800 Richmond Highway, Arlington, VA; 703.486.1111) and via webinar; click here for details

MEETING OVERVIEW

Coastal Pelagics Management Board
August 7, 2024
1:30 – 4:00 p.m.

Chair: Spud Woodward (GA) Assumed Chairmanship: 1/24	Technical Committee Chair: Cobia: Angela Giuliano (MD) Spanish Mackerel: Vacant	Law Enforcement Committee Rep: Capt. Scott Pearce (FL)
Vice Chair: Lynn Fegley (MD)	Advisory Panel Chair: Craig Freeman (VA)	Previous Board Meeting: May 1, 2024
Voting Members: RI, NY, NJ, DE, MD, PRFC, VA, NC, SC, GA, FL, SAFMC, NMFS (13 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from May 2024

3. Public Comment – At the beginning of the meeting, public comment will be taken on items not on the agenda. Individuals that wish to speak at this time must sign-in at the beginning of the meeting. For agenda items that have already gone out for public hearing and/or have had a public comment period that has closed, the Board Chair may determine that additional public comment will not provide additional information. In this circumstance, the Chair will not allow additional public comment on an issue. For agenda items that the public has not had a chance to provide input, the Board Chair may allow limited opportunity for comment. The Board Chair has the discretion to limit the number of speakers and/or the length of each comment.

4. Atlantic Cobia Fishery Management Plan Review (1:45-2:00 p.m.) Action

Background

- State Compliance Reports for Atlantic cobia were due on July 1, 2024.
- The Plan Review Team reviewed each state report and compiled the annual Atlantic Cobia FMP Review **(Supplemental Materials)**.

Presentations

- Overview of the Atlantic Cobia FMP Review Report by E. Franke.

Board action for consideration at this meeting

- Accept Atlantic Cobia 2024 FMP Review Report for the 2023 Fishing Year and State Compliance Reports.

5. Atlantic Cobia Draft Addendum II (2:00-3:50 p.m.) Final Action

Background

- Atlantic Cobia Draft Addendum II proposes options for recreational allocation, including the data timeframe and geographic scope of the allocation framework, process for future updates to allocations, addressing data uncertainty in the harvest target evaluation process, and timeline for setting management measures **(Briefing Materials)**.
- Public comment was gathered in June and July through public hearings and written comments **(Briefing Materials)**.
- The Advisory Panel reviewed the draft addendum on July 25 **(Supplemental Materials)**.

Presentations

- Overview of options and public comment summary by E. Franke.
- Advisory Panel report by E. Franke.

Board actions for consideration at this meeting

- Select management options and implementation dates
- Approve final document

6. Update on South Atlantic Fishery Management Council Mackerel Port Meetings (3:50-4:00 p.m.)

Background

- The South Atlantic Fishery Management Council (SAFMC) is conducting a series of port meetings for king and Spanish mackerel throughout 2024 to gain a comprehensive understanding of those fisheries from stakeholders to inform management efforts.
- Port meetings have already taken place in North Carolina, New England states (virtual), and New York.
- Port meetings are currently occurring in Georgia (late July) and South Carolina (early August).
- Port meetings in Florida and Mid-Atlantic states will be scheduled for October and November, respectively.

Presentations

- Update on SAFMC Mackerel Port Meetings by J. Carmichael

7. Other Business/Adjourn (4:00 p.m.)

Coastal Pelagics (Cobia and Spanish Mackerel)

Activity level: Moderate

Committee Overlap Score: Moderate

Committee Task List

- Cobia TC – review proposed state measures for 2025 based on harvest target evaluation
- Cobia TC – Most TC members participate in the SEDAR 95 benchmark stock assessment process
- Spanish Mackerel TC/PRT – October 1: Compliance Reports Due
- Cobia TC/PRT – July 1: Compliance Reports Due

Technical Committee Members:

Cobia TC: Angela Giuliano (MD, Chair), Nichole Ares (RI), Zachary Schuller (NY), Jamie Darrow (NJ), Josh McGilly (VA), Melinda Lambert (NC), Justin Yost (SC), Chris Kalinowsky (GA), Christina Wiegand (SAFMC), Michael Larkin (SERO)

Spanish Mackerel TC: Reuben Macfarlan (RI), Zachary Schuller (NY), Jamie Darrow (NJ), Devon Scott (DE), Harry Rickabaugh (MD), Ingrid Braun (PRFC), Joshua McGilly (VA), McLean Seward (NC), Pearse Webster (SC), Jeff Renchen (FL), Christina Wiegand (SAFMC)

Plan Review Team Members:

Cobia PRT: Angela Giuliano (MD), Chris McDonough (SC), Emilie Franke (ASMFC)

Spanish Mackerel PRT: McLean Seward (NC), Pearse Webster (SC), Christina Wiegand (SAFMC), John Hadley (SAFMC), Emilie Franke (ASMFC)

Plan Development Team Members:

Cobia Draft Addendum II PDT: Nichole Ares (RI), Zachary Schuller (NY), Brian Neilan (NJ), Angela Giuliano (MD), Somers Smott (VA), Kathy Knowlton (GA), Emilie Franke (ASMFC), Chelsea Tuohy (ASMFC)

DRAFT PROCEEDINGS OF THE

ATLANTIC STATES MARINE FISHERIES COMMISSION

COASTAL PELAGICS MANAGEMENT BOARD

The Westin Crystal City
Arlington, Virginia
Hybrid Meeting

May 1, 2024

TABLE OF CONTENTS

INDEX OF MOTIONS

ATTENDANCE

Board Members

Jason McNamee, RI (AA)
Eric Reid, RI, proxy for Sen. Sosnowski (LA)
Jesse Hornstein, NY, proxy for M. Gary (AA)
Emerson Hasbrouck, NY (GA)
Amy Karlnoski, NY, proxy for Assemb. Thiele
Joe Cimino, NJ (AA)
Jeff Kaelin, NJ (GA)
Adam Nowalsky, NJ, proxy for Sen. Gopal (LA)
John Clark, DE (AA)
Roy Miller, DE (GA)
Craig Pugh, DE, proxy for Rep. Carson (LA)
Lynn Fegley, MD (AA, Acting)
Russell Dize, MD (GA)
David Sikorski, MD, proxy for Del. Stein
Shanna Madsen, VA, proxy for J. Green (AA)
Chris Batsavage, NC, proxy for K. Rawls (AA)
Chad Thomas, NC, proxy for Rep. Wray (LA)
Ben Dyar, SC, proxy, Blaik Keppler (AA)
Chris McDonough, SC, proxy, M. Rhodes (GA)
Mel Bell, SC, proxy for Sen. Cromer (LA)
Doug Haymans, GA (AA)
Spud Woodward, GA (GA)
Jeff Renchen, FL, proxy for J. McCawley (AA)
Gary Jennings, FL (GA)
Rep. Thad Altman, FL (LA)
Ron Owens, PRFC
John Carmichael, SAFMC
Jack McGovern, NMFS

(AA = Administrative Appointee; GA = Governor Appointee; LA = Legislative Appointee)

Ex-Officio Members

Angela Giuliano, Technical Committee Chair

Staff

Bob Beal
Toni Kerns
Tina Berger
Madeline Musante
Chelsea Tuohy
James Boyle
Caitlin Starks
Emilie Franke
Tracey Bauer
Katie Drew
Jainita Patel
Kristen Anstead
Jeff Kipp

Guests

Coly Ares, RI DEM
Mike Armstrong, MA DMF
Russ Babb, NJ DEP
Alan Bianchi, DC DMF
Michael Bowen, Cornell Uni.
Jeffrey Brust, NJ DFW
Jessica Clawson, FL FWC
Haley Clinton, NC DEQ
Heather Corbett, NJ DEP
Scott Curatolo-Wagemann, Cornell Cooperative Extension of Suffolk County
Judd Curtis, SAFMC
Tanya Darden, SC DNR MRRI
Julie Evans
James Fletcher, Unites National Fisherman's Assn.
Anthony Friedrich, ASGA
Keilin Gamboa-Salazar, SC DNR
Pat Geer, VMRC
Lewis Gillingham, VMRC
Angela Giuliano, MD DNR
Blaik Keppler, SC DNR
Kathy Knowlton, GA DNR
Andrew Konchek
Robert LaFrance
Sarah Lazo, NOAA
Nicole Lengyel Costa, RI DMF
Ja MacFarlan, RI DEM
John Maniscalco, NYS DEC
Genine McClair, FL FWC
Joshua McGilly, VMRC
Daniel McKiernan, MA (AA)
Steve Meyers
Jeff Moore, NC DMF
Allison Murphy, NOAA
Thomas Newman, North Carolina Fisheries Assn.
Jeffrey Pierce
Will Poston, ASGA
Harry Rickabaugh, MD DNR
Mike Ruccio, NOAA

Guests (Continued)

Zachary Schuller, NYS DEC
Tara Scott, NOAA
Amanda Small, MD DNR
Somers Smott, VMRC
Kristen Thiebault, MA DMF
Chad Thomas, NC Marine & Estuary Foundation
Taylor Vavra, Stripers Forever
Kelly Whitmore, MADMF
Christina Wiegand, SAFMC
Travis Williams, NC DEQ
Steven Witthuhn, NY MRAC
Gregory Wojcik, CT DEEP
Chris Wright, NOAA
Daniel Zapf, ND DEQ

The Coastal Pelagics Management Board of the Atlantic States Marine Fisheries Commission convened in the Jefferson Ballroom of the Westin Crystal City Hotel, Arlington, Virginia, via hybrid meeting, in-person and webinar; Wednesday, May 1, 2024, and was called to order at 10:15 a.m. by Chair Spud Woodward.

CALL TO ORDER

CHAIR SPUD WOODWARD: Good morning, everyone. I'm going to call the meeting of the Coastal Pelagics Management Board to order. For those of you online, this is Spud Woodward; Georgia's Governors Appointee Commissioner and current chair of the Board.

APPROVAL OF AGENDA

CHAIR WOODWARD: Our first item on our agenda is Approval of the Agenda. Are there any recommended modifications or additions to the agenda? Any online, probably not. I don't see any in the room, okay we'll consider the agenda approved by unanimous consent.

APPROVAL OF PROCEEDINGS

CHAIR WOODWARD: We also have the proceedings from our January, 2024 meeting in the briefing materials. Are there any edits, corrections or additions to the proceedings? I don't see any hand raised in the room. Anyone online with any? All right, we'll consider those accepted by unanimous consent as well.

PUBLIC COMMENT

CHAIR WOODWARD: Next item is Public Comment. I know we have one person online, Thomas Newman, that wishes to make a public comment. I assume this is about items that are not on the agenda, so Thomas, I'm going to call on you.

MR. THOMAS NEWMAN: Yes, my name is Thomas Newman. I want to make a comment about Spanish mackerel. I am a North Carolina commercial fisherman. I also work part time in the North Carolina Fisheries Association. I am also on the Mackerel Cobia Advisory Panel for the South Atlantic.

I just wanted to stress the importance of these fisheries to our state especially, like they were making everything work right now. Before we do any hard and fast changes, we need to take our time and look at the issues and do the right thing. Also, I talked with Mr. Batsavage earlier, last week, and all those 374 fishermen are state catch Spanish mackerel. They are all over our state for six to eight month part of the year.

They are really just a few core communities that really depend on this fish. A few dozen fishermen, less than 50, that depend on this fish to make the majority of a yearly income, and is a very, very important fish for our state and for our commercial fishermen. As this process goes along, I will be involved, and I hope anyone here on the Board will reach out and contact me if they need anything. I appreciate you guys' time, and for looking at these issues. Thank you.

CHAIR WOODWARD: Thank you, Thomas. Is there anyone in the room that would like to make a comment about anything on our Board agenda? Don't see any hands, then we'll move along.

CONSIDER APPROVAL OF ATLANTIC COBIA DRAFT ADDENDUM II ON RECREATIONAL ALLOCATION, HARVEST TARGET EVALUATION, AND MEASURES SETTING FOR PUBLIC COMMENT

CHAIR WOODWARD: Our next agenda item is an action item, and that is to Consider Approval of Atlantic Cobia Draft Addendum II, which is on Recreational Allocation Harvest Target Evaluation and Measures Setting for Public Comment. I'm going to turn it over to Emilie to walk us through, and we'll make sure we check our time, and we do this deliberatively, and everybody is comfortable with the final product of this. We'll turn it over to you.

MS. EMILIE FRANKE: Thank you, Chair. I'll review the timeline for the Addendum and also the current management process to get started, because I think that is helpful context. Then I will get into the

Statement of the Problem, and the management options. I'll also highlight some points from the Plan Development Team.

The PDT submitted a memo in your materials as well, so I'll note those in red throughout the presentation. As a reminder, as the Chair stated, this is a Board action for consideration to potentially approve this document for public comment today. The Board initiated this Addendum in October of last year to address recreational reallocation using more recent harvest data, and also to consider alternatives to the current state-by-state management framework.

Then most recently at the last meeting, the Board did provide some additional guidance to add some options addressing future updates to allocations, to consider uncertainty, and also the timeline for setting measures. Based on that additional Board guidance in January, the PDT developed the draft document, which you have in front of you today.

The Board is considering approving that draft addendum for public comment today, and if it is approved, we would conduct public hearings, and the public comment period this summer. Then the Board could review the public comment and select final management options at the next meeting in August.

Just a brief review of the current recreational management process regarding allocations and harvest target evaluations. The Board can set the total harvest quota for cobia for both sectors for up to three years, and 96 percent of that quota is allocated to the recreational sector, 4 percent to the commercial sector.

Then that recreational portion of the quota is then allocated further to the non de minimis states, so that is Virginia, North Carolina, South Carolina and Georgia. Then there is a 1 percent set-aside for de minimis states. Then those allocations are based on the state's historical landings, with 50 percent based on landings from 2006 to 2015, and then 50 percent based on landings from 2011 to 2015.

Then those allocation percentages are used to calculate a soft harvest target for each of those non de minimis states. Then four of those states with soft targets, the realized harvest is evaluated against those soft targets every time the Board sets the total harvest quota. That is up to every three years, or sometimes more frequently.

To do that evaluation, we take an average of up to three years of harvest because that has been under the same set of recreational management measures, and if the state's average harvest exceeds their target, that state must adjust their measures to reduce back down to their target.

If a state's harvest has been less than their target for two consecutive years, then the state can choose to liberalize measures to reach their target. Then any changes to measures have to be reviewed by the TC and then by the Board. Most recently, last year the Board set the total harvest quota for 2024 to 2026.

Then we did conduct an evaluation of state average harvest for the years 2021 and 2022, and compared that to the state harvest targets. However, based on some TC analysis and recommendations, the Board decided to actually maintain status quo state management measures for this year, 2024, instead of requiring reductions for states that exceeded their targets. Essentially this new addendum the Board discussed is intended to dictate what will happen in 2025.

What the allocation framework will look like and going through that evaluation process, which might include updated harvest targets, depending on the outcome of this Addendum. In addition to having this addendum to determine what happens next year, we also have the upcoming stock assessment, which is just getting started on that SEDAR 95.

We anticipate that stock assessment will be available to inform management in either 2026 or 2027, depending on exactly when we get the assessment results. Sort of a lot to think about coming up the next few years. Getting into the statement of the problem for this draft addendum. The original

Interstate FMP established and used state-by-state allocations.

Then Amendment 1 in 2019 updated those allocations to add that de minimis set-aside of 1 percent. Those allocations are based on data, as I mentioned from 2015, but the distribution of cobia recreational landings has changed since 2015. We see an increase in some Mid-Atlantic states, but landings have been relatively stable in many of the southern states, so this indicates more of a range expansion versus a range shift.

We also had Rhode Island and New York declare into the fishery recently, due to the increasing presence of cobia in their state waters. Updating the allocation data timeframe used for cobia would account for these changes in landings that we've been seeing. Originally the state-by-state allocation framework was implemented to provide flexibility to the states.

However, there is concerns that the MRIP estimates for cobia has very high PSEs because of the pulse rare event fishery. There are also concerns about using these highly uncertain state estimates to continue to evaluate performance and make management changes at the state level. One way to reduce that uncertainty is to potentially increase the sample size by switching to a regional or coastwide allocation framework.

Uncertainty with these harvest estimates could also be addressed by thinking about how many years we're including in our average when we do these evaluations, whether to use point estimates or not, and also, whether a state or region's performance should be considered on its own, or should also take into account the performance of other states or regions. Additionally, we know that allocation percentages may need to be updated in the future. There are a few potential scenarios.

One is if a current de minimis state loses their de minimis status. That means that de minimis state would have to be factored in to the allocation calculation, and get their own harvest target. If that happens, all of the allocation percentages will need to be updated. Then the percentages might also need to be updated if MRIP updates their harvest estimates, based on the work that they're doing right now to look into the bias in some of their estimates.

If future updates to these allocation percentages are considered through our typical addendum process, those updates could take several months. But if the Board could make those updates via Board action or Board vote, those updates could be accomplished more quickly. There has also been a concern about changing measures too frequently for the cobia fishery.

Right now, the Board can set the total harvest quota for up to 3 years. There was discussion about, to avoid management whiplash in changing those measures frequently, the Board could consider setting specifications for a longer period of time. I will get into the management options for this draft addendum.

Again, a huge thanks to the Plan Development Team. We had a great team working on this, and it has also been a joint effort on the staff end between myself and Chelsea. There are five sections in the management option portion, so I'll just go section by section, in terms of the options here.

Section 3.1 is the allocation framework itself. This section considers both how the quota is allocated on a geographic scale, so either state by state, regional or coastwide. Then it also considers the data timeframes at the basis for allocation. Status quo we have the weighted timeframes, 50 percent based on 2006 to 2015 landings, 50 percent based on 2011 to 2015; that's our status quo.

The alternative timeframes to consider here would be basing allocation on 2018 to 2023, or we have two additional weighted options, so 50 percent based on 2014 to 2023, so the previous 10 years, and then 50 percent based on 2018 to 2023, so the previous 6 years, or a weighted combination of that 10-year time span plus the most recent 3 years, 2021 to '23.

Just a note that 2016 and 2017 are excluded from these allocation calculations due to fishery closures,

and 2020 is also excluded, due to the COVID 19 impacts on MRIP. But just to clarify in the draft addendum. It is inconsistent in some places right now, you know it's a 2018 to 2023 the 6-year time span, but we have 5 years of data, 2014 to 2023 the 10-year time span, we have 7 years of data.

If this Addendum is approved for public comment, we'll make sure that that is clear in the Addendum. Just also a note before I go any further. The final MRIP estimates for 2023 are now available. The Addendum was drafted with preliminary estimates, because that is what we had at the time. But there were very minor updates to the cobia harvest estimates. Some of the allocation percentages changed by less than 0.01 percent, so not much change with the final MRIP data for this year. Getting into the specific options about how the quota could be allocated on the geographic scale and the timeframes.

We start with our status quo of course, Option A, state by state allocation with our 2006 to 2015 data. Option B would be continuing with a state-by-state allocation, but the allocations could be updated to either of the 3 alternative timeframes that I mentioned, so either the past 6 years, the combination of the past 10 years and the past 6 years, or the combination of the past 10 years and the past 3 years.

Then for the updated state by state allocations, the de minimis set aside would increase to 5 percent, and that would be to account for the increased landings that we've seen across de minimis states over the past few years. Status quo, we only have a 1 percent de minimis set aside, but the PT noted that landings have increased, and that 5 percent would better account for those de minimis landings.

Here is the table, this is the same one in the Addendum. But essentially you can see that the first column is Option A, status quo. Then for all of the alternatives you see a lot of the quota with the updated data, which shifts up to the Mid-Atlantic. North Carolina's quota would decrease, and then South Carolina and Georgia's would also decrease a little bit.

The PDT notes that these changes to the state allocations based on these updated data are pretty significant. It results in a pretty significant change for some states. Again, the magnitude of these changes is primarily driven by Virginia's increased proportion of the harvest in recent years, and North Carolina's decreased proportion of the harvest in recent years.

The PDT did talk about, because these are significant changes, whether or not to phase in these changes. But the PDT determined that this would result in, you know constantly changing targets and measures from year to year. The PDT wouldn't recommend doing any sort of phase in approach.

But the PDT does recognize that these would be pretty significant changes. The next option after the state-by-state options would be a regional allocation option. There are options in the Addendum for 4 different regional breakdowns, including options for either a 2-region approach or a 3-region approach.

The PDT does recommend a 2-region approach. The PDT is recommending that the Board remove the 3-region options, because 3 regions would result in having a northern region that is just several de minimis states, and those de minimis states would have less than 2 percent of the allocation.

Their landings are really variable, and they have really high PSEs, so the PDT would recommend just removing the 3-region approach and considering 2 regions. The other point to consider is where to draw the line between regions, and a question from the PDT is, should North Carolina be grouped with Virginia and states northward, or should North Carolina be grouped with South Carolina and Georgia? Previously there has been some tagging data that indicate that Virginia and North Carolina represent the same group of fish. That could be a rationale to group Virginia and North Carolina together. However, the PDT noted that when you're looking at the timing of harvest throughout the year, North Carolina's peak harvest tends to more closely align with South Carolina and Georgia's harvest.

That could be a rationale to group North Carolina with South Carolina and Georgia. The PDT

recommends if the Board does have a preference at this point for these regional groupings, the Board could consider removing some of the other options. Then of course, these regional allocations would consider the same 3 timeframes that I mentioned for the other options.

The goal with these regional allocations is to eventually establish a consistent region wide size and vessel limit. But the seasons could still vary among states, noting that depending on cobia availability, the seasons might be different from state to state. Measures in each state, if the Board went with a regional allocation, would remain status quo, until either that region needs to take a reduction, or until the next stock assessment, when likely things will change.

Once one of those things happens, either the region needed a reduction or we have the next stock assessment, then the Board would consider how to come up with a region wide consistent size and vessel limit. These tables are the same ones that are in the draft Addendum. I'll just highlight on this slide, these are the options for the southern region, which would be just South Carolina and Georgia.

For the two-region breakdown you have Virginia north would have somewhere between 84 and 87 percent of the quota. South Carolina and Georgia would have between 12 and 16 percent. Then if you have that 3-region breakdown you add that very northern region that would have less than 2 percent of the quota.

This slide again, this is in the draft Addendum, shows the options for if you have a southern region with North Carolina grouped with South Carolina and Georgia. In that instance, South Carolina, North Carolina and Georgia would have between 26 and 33 percent of the quota, and then Virginia north would have somewhere between 67 and 74 percent of the quota.

After the regional allocation option, we moved to Option D, and this is just the coastwide target option. There wouldn't be any sort of state or regional allocation, there would simply be the coastwide recreational harvest quota. You would look at the total coastwide harvest in comparison to our coastwide quota.

Again, the goal was to be eventually establish a coastwide consistent size and vessel limit with seasons that could vary among the states. Again, the measures would remain status quo in each state, until either the coast needs to take a reduction or until we have the next stock assessment. Just to sort of wrap up all of these allocation framework options.

Conservation equivalency would not be allowed for any of these allocation options. For the state-by-state framework, this already allows flexibility for each state to tailor measures, you know based on what they desire for their state. Then the regional or coastwide framework, the objective here is to get to a consistent size and vessel limit for either the region of the coast, so conservation equivalency would not be allowed. The PDT had a couple of just closing thoughts here on the allocation framework. You know each of these types of frameworks coastwide, regional, state by state, do have benefits and challenges.

The regional or coastwide allocations could pool data into larger sample sizes to reduce uncertainty, but then of course you have the challenge of coordinating among states to come up with a consistent size and vessel limit. Then of course there are several underlying challenges that this Board has discussed frequently, which again is high PSEs in general for cobia recreational harvest estimates.

The seasonal migrations, you have different availability along the coast throughout the year. Also, Atlantic cobia is a relatively new species under Commission management, so the original FMP was implemented in 2017, and then we just transitioned to sole management in 2019. It's only been a few years under this management.

That was I promise the longest section, 3.1. Moving on to Section 3.2. This is regarding future updates to allocation. Option A would be status quo. Any changes to allocations would have to go through the typical addendum process. The alternative here is

Option B, where allocations could be changed via Board action, so simply a Board vote, but only for two specific scenarios.

Those scenarios would be 1, if a state loses de minimis status and therefore needs to be factored into the allocation calculations. The allocation framework, the data we're using for allocation that would all stay the same, you would just need to factor in that additional state that needed their own harvest target.

Then the other scenario where the Board could change allocations via Board vote would be if the allocation source data were updated. For example, if MRIP makes any changes to their estimates over the next few years. The next section, Section 3.3 is on data and uncertainty. In this section Option A is status quo, which is you will continue to use up to a 3-year rolling average when we evaluate harvest against the target.

This is an average of up to 3 years under the same management measures. Option B, the alternative here is using up to a 5-year rolling average for the evaluation, and this would be an opportunity to incorporate additional years of data, since landings can really vary from year to year, and knowing that we have high PSEs in some years.

Another feature of this section on data and uncertainty is a confidence interval provision, which would be a part of this section of the Addendum. If the Board chose a regional or coastwide allocation framework, this provision would allow the Board in the future to decide if the Board wanted to switch from a rolling average approach to a confidence interval approach for harvest target evaluation.

We would be looking at the confidence intervals around the MRIP point estimates. This would allow the Board to more directly account for uncertainty around these point estimates. The reason it is not a specific option right now is, in order to do this, we need region-specific confidence intervals and PSEs, and those are only available via custom data requests through MRIP. We're hoping to have those before this document goes out for public comment, but this provision would allow the Board to have time to sort of digest that information on the region-specific confidence intervals, and take this up in the future if the Board wanted to switch to this approach.

How this would work is, instead of using rolling averages we would evaluate the harvest target relative to the 95 percent confidence intervals around each of the MRIP point estimates. If the confidence interval has been above the target, that means that states would have to address their measures back down to the target.

If the harvest target falls anywhere within those confidence interval bounds, then the region could stay status quo. Then if the confidence interval has been below the target, then the region could liberalize to the target. Any years with very large confidence intervals in years with a PSE greater than 50, would not be included in the evaluation, and then any years with PSEs between 30 and 50 would be evaluated by the Technical Committee.

Just a reminder, this provision would only be applicable to a regional or a coastwide approach. The PDT didn't feel comfortable proposing this for the state-by-state approach, because some of the state confidence intervals are quite large. As I mentioned, this provision is currently included in the draft Addendum in this section.

No matter which average option is chosen, this provision is there, and the Board could switch to the confidence interval approach. If the Board was more comfortable with framing this as an option instead, it could be, you know status quo. We have no provision. Alternative would be we add this provision.

If the Board didn't feel comfortable with having it in there as part of the Addendum right now, we could frame it as an option. The next section is Section 3.4. This is overage response for any recreational landing's evaluations. Currently status quo if a state or a region exceeds their target, they have to reduce down to their target.

Th alternative here is if a state or region exceeds their target a reduction would not be required if the following criteria are met. If another state or region is below their target, and that state or region has chosen not to liberalize, and if the coastwide harvest has not exceeded the coastwide quota. If those two criteria are met, the state or region that is over would have the option to just stay status quo, instead of taking a reduction.

Then the final section here is the timeline for setting measures. Currently, the Board can set specifications so that total harvest quota for up to 3 years. The alternative would be setting specifications for up to 5 years. This would potentially reduce the frequency of management changes, and also better align with when we have new cobia stock assessments. That is all the options. I know that was a lot the PDT put forward, and I'm happy to take any questions.

CHAIR WOODWARD: Thanks for that, Emilie, thanks for a very clear, concise overview of the document. I want to open up the floor now for questions for clarity. Remember, our task is to winnow this down, if possible, as a public comment document. If we can kind of keep that in our forethoughts here. Shanna, I saw your hand.

MS. SHANNA MADSEN: I just want to stop for a second and say thank you, so much, to Emilie and Chelsea and the PDT. I listened in on their deliberations, and I felt like we kind of just threw a task at them and said, we don't know how to do this, can you figure it out? They really did. I think this document is incredibly strong. I was really impressed by the way you took the time to explain everything. I think it's a really good document.

My question is in relation to the provision on the use of the confidence intervals. I was just wondering, under like what circumstances eventually, would we be able to implement the approach? I know you're saying that there is not the ability currently for us to get to those confidence intervals regionally, without putting in a specific MRIP data request. Are we just kind of waiting for that to like appear on the website, or I'm just wondering what kind of triggers, the Board could say okay, now we can consider the confidence interval approach.

MS. FRANKE: We actually have already submitted a data request for the region-specific confidence intervals and PSEs. We should have those in hand very soon. If the Board moved forward with this Addendum and the Addendum has this provision, any time after the Addendum is approved, and we have that information, the Board could consider whether or not you wanted to switch from the rolling average approach to the confidence interval approach.

You know if the Board approved this Addendum in August, and we have the region-specific confidence intervals in hand. The Board could also immediately take action to implement that confidence interval provision. The goal is to have hopefully the data in hand over the next few weeks.

Hopefully include it in the public comment draft as an appendix to look at the PSEs for those different regions. It is up to the Board how quickly, if the Board wanted to wait to consider this confidence interval approach, you know with the next assessment for example, or wanted to switch to the confidence interval approach right away. That would be up to the Board.

CHAIR WOODWARD: All right, Chris Batsavage.

MR. CHRIS BATSAVAGE: Thank you, Emilie, for going through the document, it's very well done and covers everything we need to consider. This is unclear. Under the regional allocation option, if that was chosen, the states would maintain their state-by-state regulations until the next assessment, right?

MS. FRANKE: Correct. Right now, measures vary among most states. The size limits across states are pretty much consistent, but the vessel limits are different for almost every state. That is right, if the Board chose a regional approach, all of the states would stay status quo, until the next stock assessment, so for a couple of years.

However, if we move forward with the regional approach, later this year we would have to do a regional evaluation of how the regions harvest compares to their new regional target. If that region needs a reduction, then we would have to immediately switch to a new consistent regional measure. However, if the region didn't need a reduction, then things would stay status quo until the assessment. It's either stay status quo until the assessment, or we have to change right away if that region ends up needing a reduction.

CHAIR WOODWARD: Thanks for that, Chris, because I think that is very important that we clearly understand the sequencing of how those things work. I mean we're trying to put reasonable sideboards on it, but give ourselves some flexibility to adapt to the circumstances we're facing here. Lynn.

MS. LYNN FEGLEY: It it's okay, I now have two questions. The first one is about the confidence limit approach. Practically, if we were to switch to that approach. Does that mean that states would be in a position where they may have to update measures each year, since we're no longer doing the average?

MS. FRANKE: That's a good question. No, so it would be on the same timeline as our current approach, where we're only doing those evaluations and potential management changes every few years, whenever we have a new total harvest quota.

MS. FEGLEY: Okay, thank you, and then the follow up is about Chris's question. The states would in a region, would maintain status quo measures. But if an upcoming evaluation showed they needed a reduction, the answer was, states would immediately have to move to a consistent measure. My question is a little bit about the definition of immediate. When does the evaluation occur, and when would the consistent regulations have to be implemented? I just want to understand if that is within states abilities to act.

MS. FRANKE: Yes, that was a great point of clarification on my end. If the Board were to select a regional management approach, and approve this Addendum in August, this Addendum would dictate what the measures would be for 2025. Between the August and October meeting, we would do the regional evaluation. You know how is each region doing relative to their target? If a region was over their target and required a reduction, we would come to the October meeting with proposed measures for that region to then implement in 2025.

CHAIR WOODWARD: Yes, and I think it's also important to remember that we don't get finalized MRIP estimates until this time of the following year for the previous year's estimate. We're always gong to be sort of behind, which is an unavoidable reality that we're facing here. We just now got the approved final 2023 estimates. You're going to deliberate at the end of that year for what happened the previous year to set the following year. Doug.

MR. DOUG HAYMANS: Emilie, thank you for a good, clear understandable document, for me at least. You really brought up some great points, particularly around FES estimates and high ESEs, which to me sort of makes the entire process we're going through questionable at the moment.

Especially since some of this can change after the FES report is finalized, or the potential there is. I have great concern with taking this out to the public beyond this meeting, particularly with some of the large cuts that the southern states are taking, and where those cuts go. At an appropriate time, I think, I'm close to making a motion to tabling this until the FES report is done. With that said, I do have a question for John. I realize, Emilie, we can't anticipate every scenario.

But there was discussion about if we go with the regional approach that PSEs could get considerably better, and John has a way of describing things to me to help me understand better. When I look at North Carolina through Georgia, and the incredibly horrible PSEs that range from 33 to 92. I realize additional trips and that tighten those up. Do we really see getting out of a yellow zone that we get below 30, would you think, by pooling those three states estimates?

MR. JOHN CARMICHAEL: Maybe, but you know given what you see for the individual states, it does make you question whether or not putting them all in there, I think it would come down to just, are the states at all similar? If they are all really variable and not really similar to each other, then you may end up in basically the same boat.

You are putting some more observations in there, which probably brings it down some. You know it may bring some of those 90s down to something more reasonable. Does it bring the majority into the green zone is harder to say. Yes, you would really have to do it to be sure, because you guys know, this MRIP stuff is, you think you know what is going on until you run the numbers. It's really hard to guess how it's going to all work out.

MS. FRANKE: Yes, and just to add to that. The PDT did acknowledge that grouping the states into regions could provide some improvements. But the magnitude of those improvements is unknown. Hopefully we'll have the data from MRIP on our custom regions, to understand how much the PSEs would improve. But the PDT noted, you know while they might improve a little bit, this won't solve the problem of uncertainty.

MR. CARMICHAEL: Yes, and I think it's great to see it getting way from the three-year average, or at least looking at alternatives, because that is good if things are just kind of noisy, but more or less correct. But you know we know with MRIP the challenge is always the spikes that people don't think is necessarily legit, so then in a three-year, five-year moving average you live with that over the time period.

That's one of the reasons the Council moved away from those, because we have so many uncertain species that are rare events, and they tend to be really spikey. They go from zero to 100,000 from one year to the next. I think the confidence interval has stepped in the right direction. I just wonder.

When the other method has come up in the MRIP evaluations of rare events is looking at multiyear estimates, where they would take the total of observations of MRIP over say three years, and generate a single estimate from all of those observations. I just wondered if the PDT talked about that.

Of course, it does add some complexities, because depending on how you calculate that period, you may have a greater lag, and when you get your actual estimate that you're going to use to judge the fishery. But it does seem to be a more robust place, and it wouldn't put the Board in a position to trying to decide, okay what confidence interval do we actually want to use as well?

MS. FRANKE: Yes, the PDT did not specifically look at that alternative approach, just the average and the confidence interval. I just want to also remind everyone; the confidence interval approach would only be applicable to a regional or coastwide framework. The PDT didn't feel comfortable proposing the confidence interval approach for a state-by-state framework, because some of the state confidence intervals are very large.

CHAIR WOODWARD: Yes, I think we're all fixing to have an uncomfortable reality here with the day we got it, until we go to some different alternative than MRIP, something like Virginia's done, we're going to be facing the same situation. But even that has got its own problems. It seems like we're sort of trapped in a world of imperfection. Any further questions? John.

MR. JOHN CLARK: Thank you for the presentation, Emilie. I guess I've got de minimis on the brain, because of our close call with spot yesterday. But just curious, with the 5 percent set aside. It looks like if we do go with state by state with de minimis that there are 5 de minims states now, and theoretically they could exceed 5 percent and remain in de minimis.

First question is, what happens if that does happen and they exceed the 5 percent, and then just curious with some of the other measures there would be no de minimis, correct? Like a state in the regional or the coastwide would have to just adopt whatever the default regulations are.

MS. FRANKE: Exactly. The way the FMP is currently set up with a state-by-state allocations, there is no evaluation of or repercussions if the de minimis states in total exceed their set-aside. There Is not a formal, if all de minimis states exceed their set-aside there is no repercussions in FMP. I assume that was set up that way, de minimis states are so variable in their landings, so there is no formal evaluation of the de minimis states against their target.

The set-aside is simply there to sort of try and account for the variable landings in those states. You're right. Theoretically, you know each de minimis state could exceed 1 percent in a year and we'll have slightly over the 5 percent de minimis in a certain year. But the PDT felt that there might be a few years like that, but largely the 5 percent should be sufficient for now to account for that.

Then correct, if we move to a regional or coastwide framework, the de minimis status becomes somewhat irrelevant, because right now de minimis states have the option to implement a slightly less restrictive size limit. But in the regional or coastwide framework the de minimis states would simply have to adopt whatever the rest of the region is adopting. The de minimis status becomes a little bit irrelevant.

CHAIR WOODWARD: Yes, it's hard to have payback provisions for something you probably don't catch. Again, that is kind of an odd situation. Chris, and then I'll go to Joe.

MR. BATSAVAGE: On that point, Emilie. I guess where de minimis still has some status in a region, if a region had to take a reduction and it was decided that shortening a season was the way to meet that reduction, and that was handled through the non de minimis states, since the different states can have different seasons, then that would be a scenario where the de minimis states could actually maintain the regulations in that region. I just wanted to make sure I understand that correctly.

MS. FRANKE: Yes, so you're talking about the scenario where if we, like later this year we move to the regional approach and a region needs a reduction. It turns out that if only a couple states in that region were to take a season change, you could just meet that reduction and stay status quo. That is an interesting scenario.

The objective of the regional approach is to at least get on the same page with the size limit and the vessel limit. I don't think as written; we could only change the seasons and go from there. I think the regions would need to get to a consistent size and vessel limit, and then the seasons could still vary.

MR. BATSASVAGE: Yes, thank you. I probably should have been more clear on kind of the scenario. I guess I'm kind of thinking ahead, where the states did align their size and bag and vessel limits, and it came time for a reduction that an option could be for the non de minimis states to take reduction through a change in their season, and leaving the de minimis states to maintain what they already had.

MS. FRANKE: Yes, absolutely. In the future, if the states in a region decided, all right, just a couple of our states are going to change their season, and everyone else can have their same season. That would be up to the region, absolutely.

CHAIR WOODWARD: All right, Joe.

MR. JOE CIMINO: Thank you all for the hard work, I agree this is a pretty solid document. Not following it that closely. My question then is following on Chris's. A little bit more of an understanding of the exploration of conservation equivalency. There are actually a lot of us sitting around this table now.

There are a lot of states, and you know the idea of coastwide measures, where there is only say one state with a V that is continuously having large harvest. I think that we're all ratcheting down on regulations, and trying to explain to folks, you know that there is no CE when we do it with so many other species. Just curious, about how that didn't end up in this.

MS. FRANKE: Yes, I think that's just sort of the inherent difference between the state-by-state approach or even the region approach versus the coastwide approach. The state-by-state approach

gives the states the flexibility to change their measures, you know have different measures.

Moving to a coastwide approach would have that added challenge of just looking at everything from a coastwide lens, like looking at harvest from a coastwide lens, management measures from a coastwide lens, without getting sort of into the state by state. You know is this state up but this state's down. You know we would just be switching to that coastwide perspective.

MR. CIMINO: I'll follow up, because I'm almost embarrassed. I think what we would then be explaining to the public is if you do believe that then that state-by-state approach is the way that we should handle it. Okay, thank you.

CHAIR WOODWARD: Okay, any more questions for clarification? Dan.

MR. DAN ZAPF: Just to pile on, thank you to the PDT, really a lot of work went in, and appreciate that. Definitely want to echo some concerns from Doug regarding PSEs. Obviously, I don't know if that is going to change any time in the future. But on the flip side of that don't want to stick our heads in the sand completely.

But not sure if there is any merit to looking at when some of these regional numbers might come through in the next few months, if that's going to change anything drastically. I don't know. If we feel that is a possibility, question one. Then also, just for my clarification, and Lynn, thank you for pointing that out and sorry for slow on the uptake. If changes get made in '25, then requirements for states to take action would have to be within that same year. Is that correct?

MS. FRANKE: Yes, if the Addendum is approved in August, or even if the Board pushed the Addendum one meeting cycle, and approved it in October. Well, it would be up to the Board. But if the Board wanted to implement for 2025, that evaluation would occur at the end of this year, 2024 to figure out what changes to measures would achieve the reduction. Then if the Board felt that a 2025 implementation date was feasible, the Board could decide to have those measures implemented in 2025. It's really up to the Board, as far as implementation date, and sort of how that would work. But sort of the fastest timeline would be if the Board approves this Addendum in August, the evaluation against the targets happens between August and October, and then at the October meeting the Board decides what the 2025 measures will be.

As I mentioned, the Board could, if the Board pushed this one meeting cycle, the Board would then be approving this Addendum in October. Then potentially, would be looking at an evaluation, and figuring out new measures in January, 2025. I think it would be up to the Board to decide if we approve new measure in January, 2025, is that enough time for states to implement for the 2025 season or not? That would just be something the Board would have to think about.

CHAIR WOODWARD: Shanna.

MS. MADSEN: That brings up another question. Since there is talk of tabling, what happens if this document is tabled into the foreseeable future. What can we expect to do this fall?

MS. FRANKE: Yes, great question. If this Addendum is tabled, or if the Board sort of runs out of time to do the evaluation and measures for 2025. Right now, the Board has only set measures for this year, 2024. The Board needs to do something for 2025. That could either be this Addendum is approved and we're using the new Addendum to figure out 2025. It could be the Addendum is approved, and we do the evaluations, but the Board, perhaps as they did last year, request the TC look at the impacts of just staying status quo for one more year, and the Board could consider that, or the Board tables this Addendum for a few years, and we just use the current process we have, which is those state-by-state evaluations and our current target. Either way, the Board has to do something for 2025. Whether that is using this new Addendum or not is up to the Board.

CHAIR WOODWARD: I think that is the fundamental question that this Board needs to decide right now. You know there is no need of going into the details of this Addendum right now if there is not a collective will to proceed down this course of action in some form or fashion, depending on how the Addendum was modified. At this point I would welcome a motion so that question can be asked and debated, and decided. Doug.

MR. HAYMANS: I would **move that Addendum II to Amendment 1 be tabled until such time as the final FES Report is presented to the Commission, at which time we would resume deliberations in this Addendum**.

CHAIR WOODWARD: All right, do we have a second for that motion? Is that a question or a second?

MR. CLARK: Well, I'll second just for discussion purposes. But isn't that a motion to postpone rather than table?

CHAIR WOODWARD: Yes, it's probably the proper Roberts Rules of Order procedure.

MR. HAYMANS: Well, I mean there is tabled to time certain, right? I guess it's not a time certain it's FES Report.

CHAIR WOODWARD: Yes, I think we don't know when that report is going to be produced, so we really don't know what that time is, for one thing. It puts it kind of out there into infinity. But if you say postpone. Tabling is different than postponing. Postponing would say until a future meeting. Do you want to change that to postpone?

MR. HAYMANS: Certainly.

CHAIR WOODWARD: Okay, so John, you still willing to second that as stated, for purposes of discussion. Okay, so we had some hands pop up. Will you raise the hands again, whoever? I think I saw Lynn and then who else? Hold on, let me get a whole list. I've got Lynn, Shanna, Chris and who else? Raise your hand again if you want to comment. I got you, Chris. Okay, I'll go to you, Lynn.

MS. FEGLEY: This is not a comment specifically on the motion, but there was a memo. I don't think I'm talking out of school. There was a memo released, talking about the timeline for the time series of calibrated catch and effort estimates being available for incorporation in the stock assessments no later than spring, 2026. I just wanted to provide; I think there is starting to be a little bit of a timeline coalescing around when these time estimates might be available. It looks like it will be in the early part of '26.

CHAIR WOODWARD: All right, so that is when they are projecting to have the results of the more expanded study, and then they're going to have to incorporate that into some sort of recalibration process, which would probably take another unknown period of time. Realistically, you're probably looking at '27 before you'll have revised catch estimates for us to argue about.

All right, just so everybody has a timeframe here. What we're talking about is postponing possibly into 2027, so at least two more, possibly three more fishing seasons under status quo. That's what we're dealing with here. All right, I've got Shanna and then I'll go to Chris Batsavage.

MS. MADSEN: Obviously I'm going to speak in not support of this motion. I feel like this is something that we have discussed now at every meeting at each part of this process, and the Board has been asked this question several times, if they want to continue to move forward with this document.

I think the document was put together extremely well, and I think it outlines a lot of the positive influences that could be made by changing to regional approaches. We're facing issues with de minimis states falling in and out of de minis. We're facing issues with overages in areas where we know that we really can't stop the fish from going to any more.

We're in a place right now where we recognize that we're probably not going to get those FES numbers until 2027 at this point, we get those calibrations, and then how long into the future until we're

actually able to implement them? I just can't sit by and say that we're going to wait this one out. It is essentially just sticking our heads in the sand and pausing absolutely everything, just because we know this is coming.

There is a very specific portion of this Addendum that allows those numbers to be changed without us having to go through an addendum process, where if this Addendum did not go through, my understanding that we would have to go through another process to change all of those numbers, and we would end up back here again doing this again. For me, I'm not going to support this motion.

CHAIR WOODWARD: Chris Batsavage.

MR. BATSAVAGE: Yes, I'm also in opposition of postponing this. Shanna basically said every comment that I was going to say. I guess the one thing I'll add is, I think we've learned that MRIP is an iterative process. They continually kind of check their methodologies, and we get changes to the estimates over time. I think this will be about the third one, fourth one, I'm losing track.

The one that they're working on now probably won't be the last. I think this is the environment we're working in, as far as managing recreational fisheries. I think we need to move forward with the items, at least that won't be as impacted by any new FES calibrations that are in this Addendum that we know are a problem. That's why I don't think we should postpone this.

CHAIR WOODWARD: I'm going to ask John Carmichael just to make another brief comment just to clarify what our expectations are of the timing of the FES study results and recalibration report, so everybody will have that before we make a decision.

MR. CARMICHAEL: Yes, I just wanted to comment, and thank you, Spud. There was a recent NOAA Fisheries guidance on the FES that went out to a whole bunch of people. In that they say that they anticipate having what they call tentative recalibrated estimates in spring of 2026, with the timeline they normally put out the 2025 estimates. They'll have those recalibrated. They are doing the comparison this year, and then the analysis in'25, and then in '26.

But, as we all know, that things are always contingent and there is a number of contingencies about, you know getting reasonable results and being able to trust the comparison, and being able to develop a recalibration process. Of course, it's always if considered necessary. The earliest you would be getting anything that you could look at numbers would be spring 2026, and then any changes would go in, probably in 2027 to a program overall.

CHAIR WOODWARD: Doug.

MR. HAYMANS: I heard stick your head in the sand twice, I guess I prefer kick the can, as opposed to sticking my head in the sand. But I think the realities of the issues that FES faces are enough for me to say, I don't want to take anything that is in 3.1 out to the public. I can't see North Carolina taking the cuts that it is planning to take, or South Carolina and Georgia, which is 1 percent,

But taking the cuts based on something that we acknowledge is potentially flawed up to 30 to 40 percent. I like options between 3.2 and the rest of the document. I think we could discuss those. But to me that is why I'm opposed to moving forward is everything that is in 3.1, and the reallocations there, which is a part of the document.

CHAIR WOODWARD: Any other discussion on the motion? I'm going to give us a few minutes to caucus before I call the vote on this. We need to dispense with this, because we only have about 30 minutes left, and we've got a lot more to do. I'll give everybody, let's make it three minutes of caucus.

Okay, everybody good on caucus? Well, we have a motion before the Board. I'm just going to read it again to make everybody is clear. It's **move to postpone Draft Addendum II to Amendment 1 until such time the final MRIP FES Report has been presented to the Commission**. **All those in favor, signify by raising your hand.**

Okay anybody, I guess there is nobody online. Everybody is represented here. **We have 2 yea votes, all right opposed like sign. Seven, all right abstentions. We've got 2 abstentions that's 3 abstentions. Null votes, no null votes. Council, NOAA and Florida abstain, all right, motion fails 2 to 8 to 3.** Now we can proceed with further deliberations on the draft Addendum. I have a sense that probably where we need to do our work most importantly is going to be on 3.1. I want to open up the floor on that. We had a recommendation from the PDT about the 3-region approach. I'm assuming that the Board would probably be interested in supporting that recommendation, so Shanna.

MS. MADSEN: I'm actually going to make a more simplified motion, I think first. Then we can start to have discussions about the regions. The motion that I want to make is, **move to remove the timeframes for the weighted 10-year and the weighted 3-year averages from the document, and those would be Options B3, C3, C6, C9 and C12**, and if I get a second, I'll speak to that. Thank you.

CHAIR WOODWARD: Do I have a second for that motion? Second from Lynn Fegley. All right, let's get this up on the board, make sure we're clear. Okay, is that accurate, Shanna? We've got a motion and a second. Discussion on the motion. Shanna, would you like to provide some rationale for your motion?

MS. MADSEN: Sure, the rationale for this motion is again, we're trying to simplify the document. I think that we're continuously talking about how we need longer time series averages in order to more accurately understand what is going on in this fishery. I think that the second weighted option, which is the 10-year and the 5-year average, the one that we're currently using with updated years.

I would like to see that one continues forward in the document, since that also seems to be working for everyone. But I just don't see there being a big difference between the 10 year and the 3 year and the 10 and the 5. I think that it is just easy for us to kind of try to whittle down some of those options, and keep a more stable average timeframe.

CHAIR WOODWARD: All right, we're going to go back to that slide, just so everybody can see the time series we're talking about deleting from the document, so everybody is clear. Okay, there we go. Any discussion, questions for clarification on this motion? Anything online? Any need to caucus on this motion?

I don't see anything. **Any opposition to this motion? Okay, I don't see any opposition to it, I guess nobody online. Okay, with no opposition then we'll consider that motion approved**, and that will be deleted from the draft document. Any other recommendations on this particular part of the document with the timeframes?

Everybody satisfied with that content? All right then we will move on to the next part, we can flip to that next slide if we can, we'll be talking about the regions. We'll move to the regions. We do need to answer the question of whether or not, where North Carolina goes. I know some of you have strong feelings about where North Carolina should go, but that's not what we're talking about. Okay, so we had a recommendation from the PDT to delete what would be in essence a de minimis region, so Shanna.

MS. MADSEN: I'm going to go with the PDT recommendations, after talking to some of *the de minimis* states. **That would be removing any of the options in the document that are comprised of three regions. That would be Option B4, C5, C10 and C11**.

CHAIR WOODWARD: Do we have a second for that motion? All right, Jesse. We've got a second. Any need for discussion on that motion? We had a PDT recommendation pretty strong. I think it's pretty clear that we would end up with unintended consequences from that choice. Any opposition to that motion? Seeing none; we will consider that approved.

MS. TONI KERNS: Spud, I think we might have altered the language just a little bit, just to make it very clear which options were being removed from which sections. If you just give us one second, we can write the section in there.

CHAIR WOODWARD: Yes, I'm going to read it into the record just to make sure it is clear. Move to remove any of the options considering 3 regions from Section 3.1 which is C4, C5, C10 and C11. We had a motion by Ms. Madsen and second by Jesse Hornstein from New York. Again, just to make sure we're clear, **any opposition to this motion? Seeing none; that motion is approved.** We're making progress.

We're down to two region options, and do we want to leave in what is in there regarding North Carolina being included with, I'm going to call it the north region, or the south regions. Leave those two like they are for public comment. Okay, I've seen some heads nodding so I think that looks good. Okay that's good. Any other sections of this document?

Is everybody comfortable with what else has been presented in this draft document, clear on what it means, like it is going to be clear to the public what it means when we take it out? Do you think there needs to be any modification of any of the language to make it more clear? All right, at that point I think we're ready to approve the Addendum as modified for public hearing.

Would someone like to make that motion? I've got a motion by Lynn Fegley and a second by John Clark, so it's **move to approve Atlantic Cobia Draft Addendum II for public comment as modified today**. Motion by Lynn Fegley, second by John Clark. **Any opposition to that motion? We've got one, one nay vote.** Doug.

MR. HAYMANS: That is with all due reference to Dennis's comment this morning. I still feel like I can vote my convictions though.

CHAIR WOODWARD: Okay. All right, so we dispensed with that. Thank you all very much.

PRESENTATION OF SPANISH MACKEREL WHITE PAPER

CHAIR WOODWARD: We'll move forward with that. We'll go to our second item, or fifth item actually, which is Presentation of the Spanish Mackerel White Paper. Go ahead, Emilie.

MS. FRANKE: I will provide an overview of the Spanish mackerel white paper prepared by the newly formed Spanish Mackerel Technical Committee. I don't have time to cover everything in the paper, so I'll just try to hit a few of the highlights. Just a little bit of background. This task emerged from the Board discussion about the need to better understand each state's Spanish mackerel fishery, in anticipation of future Board action to address state and federal management differences, and also recognizing emerging fisheries at the northern end of the species range.

All states from Rhode Island to the Florida east coast have declared interest in this fishery, except for Connecticut and Pennsylvania. There are some management differences between the Commission's Interstate FMP and the Federal FMP. The Board has been discussing these differences and anticipates some future action. In August of last year, the Board tasked the Technical Committee with developing this paper to characterize Spanish mackerel fisheries along the coast, with the intent of helping the Board address state waters management issues.

Thanks very much to each state who submitted a fishery profile with a lot of detail on their state fisheries. We really appreciate each state pulling that information together. First the TC noted that Spanish mackerel availability along the coast is driven by water temperature and their seasonal migration.

The Atlantic Coast stock spends the winter off the east coast of Florida, then they move northward to North Carolina in early April, and then further north in June. Then the fish move back down to the east coast of Florida again for the winter. The majority of harvest across both sectors really reflects the seasonal migration.

The majority of Florida's harvest occurs from late fall through winter, and then into early spring. Then from Georgia up until around Virginia, you start to see that majority of harvest in early summer as those

fish move north. Then up further, to Maryland off to Rhode Island, you see the majority of that harvest start to appear in sort of late summer.

Looking at the combined commercial and recreational landings in pounds by state over the past decade, you can see the recreational sector shown here in green, has accounted for the majority of harvest in most states, except for Florida, where the commercial fishery shown in blue has accounted for about 55 percent over that time period.

You can see that in addition to Florida, both Virginia and North Carolina have targeted directed commercial fisheries. The commercial proportion is a little bit larger for those two states as well. For those commercial fisheries, again only those three states, Florida, Virginia, North Carolina have directed commercial fisheries for Spanish mackerel.

Over the past decade Florida has accounted for about 75 percent of coastwide commercial Spanish mackerel landings, North Carolina for about 22 percent, and then Virginia for about 2 percent. Just for a little perspective on scale. In 2022 Florida had 436 participants in the Spanish mackerel commercial fishery, and the average landings ranged from about 300 pounds per trip in 2022 to about 600 pounds per trip in 2021.

North Carolina over the past decade has had an average of about 374 participants and they average landings about 220 pounds per trip over the last decade. Then Virginia has had about 50 to 100 participants each year over the past decade, with an average landings per trip ranging from about 30 to 200 pounds over that time.

Then the remaining states in the management unit all combined account for less than 1 percent of coastwide commercial landings over the past decade, and these state commercial fisheries, so Georgia, South Carolina and then from the Potomac River north. These are all opportunistic bycatch commercial fisheries. There are variable landings from year to year, with average landings less than 100 pounds per trip, and only a handful of participants. The vast majority of commercial fisheries are occurring in state waters. All three states with directed commercial fisheries, so Virginia, North Carolina and Florida indicated that over 90 percent of their commercial landings are from state waters in recent years. There are a variety of commercial gear types that are used.

In Florida hook and line and cast net are most common. In South Carolina trawl is the predominant gear, and that is just for their bycatch fishery. Then for North Carolina north, gill nets and pound nets are the most common gear types. Moving on to the recreational fishery. Recreational hook and line fisheries occur in all states, although South Carolina and many of the northern states indicate that the recreational fishery is opportunistic and not necessarily targeted.

Over the past 10 years Florida again has accounted for a majority of landings, 44 percent of the coastwide recreational harvest. This is in numbers of fish. North Carolina has accounted for about 32 percent, South Carolina 14 percent, Virginia 7 percent, Georgia 1 percent, and the remaining northern states for about 2 percent.

The majority again of recreational fisheries are occurring in state waters. There are a few exceptions that were noted. New Jersey noted that about 55 percent of their landings have been from state waters, the other 45 from federal. Delaware noted the majority of their landings have been from federal waters.

Then South Carolina noted that although the MRIP data indicates a majority of their landings are from state waters, their charter logbook data indicate that a majority of charter trips were actually in federal waters. Just a couple other points on the recreational harvest estimates. The TC noted that there are pretty high PSEs for some states, particularly for some of the states at the northern end of the range, and also for Georgia in some years.

The TC did note there is an increase in effort in several states from 2020 to 2021, potentially associated with COVID 19. Then looking at the recreational harvest by mode. In most states the

private and shore modes comprised over 90 percent of recreational harvest. In Virginia that was a little bit lower, private and shore comprised about 81 percent of recreational harvest in the past 10 years.

Addressing the Board's interest in any trends at the northern end of the species range. It appears that landings in the more northern states have been generally higher for the past four years, as compared to the prior several years. However, the landings are still pretty variable, and the trends can differ state to state. Up on the screen here you will see the commercial harvest for those states at the northern end of the range. On the left you have the dash line on top is Rhode Island through Delaware.

That sort of dotted line underneath is Maryland and PRFC, and the right you have Virginia. Note that the Virginia scale is much larger than those other states. But you can kind of see that the past few years the landing have sort of stayed at an, on average, a bit of a higher level than those past several years, with a very large spike in 2019. Then on the next slide you'll see the recreational harvest. This is in numbers of fish. That solid line is Virginia, the dash line is Maryland, and then the dotted line is Rhode Island through Delaware. Again, you can see sort of a spike in 2019, and landings on average staying a bit higher these most recent years. But still in the grand scheme of things, relatively small compared to some of the other states. Then just to finish up here. The TC pointed out a couple of points specific to the Florida Spanish mackerel fisheries.

Florida for both sectors typically contribute a large proportion of landings. There has been a recent decline in 2022. One factor that this Board discussed in last year's FMP review was that there are increased areas that are closed off to vessels to create safety zones associated with space launches.

This has prevented access to traditional fishing areas for Spanish mackerel in Florida. Then also a note that Spanish mackerel concentrate in easily accessible and inshore areas during the winter in Florida, and this has resulted in some conflict between the commercial and recreational sectors, because they are operating simultaneously in the same areas.

That is all I have. That was just a quick sort of highlights to the white paper. You know, I'll say this TC task was in response to the Board's interest, so if there is something, any edits or questions that you have on the white paper, please feel free to reach out to me, and we can post the white paper on the website in the near future.

CHAIR WOODWARD: Thanks, Emilie. Thanks to all the states for responding with the information. This will be an important source document as we move forward, and trying to sync up state management of Spanish mackerel with federal management. Any questions for Emilie? If not, I'm going to turn it over to John. Go ahead, Jesse.

MR. JESSE HORNSTEIN: Yes, great report, Emilie. I appreciate you going through that thoroughly, and letting everyone know about the different Spanish mackerel fisheries in each state. I just wanted to point out, I don't think it necessarily needs to be in the document, but that the U.S. Coast Guard is implementing a new tool called the Space Operations Launch Recovery.

This stands for Solar pool, which is like an online AP that people can go to, to look at where different zones might be closed for upcoming launches to better plan their trips. Hopefully with the implementation of this tool, with the U.S. Coast Guard that this might help with the limitations caused on the fishery from those closures. But more to come on that.

CHAIR WOODWARD: All right if there are no other questions.

UPDATE FROM SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL ON MACKEREL PORT MEETINGS

CHAIR WOODWARD: I'm going to turn it over to John to give us an update on Council activities.

MR. CARMICHAEL: Yes, thank you, Spud. I want to update you on the Port Meetings, long awaited. We had the first kick off round in North Carolina a few weeks ago, and it was really a resounding success.

Everyone was very pleased with the turnout we had, about 150, 160 folks across four meetings, pretty evenly spaced as well, you know four different spots along the coast of North Carolina.

That is a great turnout for meetings where you're not proposing a bunch of controversial management measures. The feedback gathered at the meetings was really good, had great conversations between, you know the fishermen and the staff there, and got a lot of good feedback about the fishery. But I really want to highlight the support that we received from North Carolina DMF to make these a success. There are two staffers in particular, Kevin Aman and Amanda Macek.

They just really went above and beyond in terms of a real personal grassroots approach to reach the fishermen, and those involved in the fishery, you know calling individuals. I think Kevin called every tournament operator in the state and said, hey these are coming up, you need to come out and speak.

I just want to stress with the ones that are coming up, we really appreciate the help from the other states and the Commission as well. If you can get a hold of the people that you know are involved in the fishery and interested in it. You know I think we can continue to get great turnout at these meetings, and you know just show us it's a good way to go out and talk to the fishermen and get input.

When you're not going out with controversy and just getting everybody who wants to tell us our data are bad and we shouldn't be managing, but really have good discussions about where the fishery needs to go. You know the Council is going to use this input to then decide where the next amendment actually goes, in terms of dealing with Spanish, and addressing the issues that are out there.

The next round will be coming up. They are doing a series of virtual meetings in New England, May 14 through 16, and this was anticipating that there is going to be lower interest up there, because the fish aren't as common and they are not as traditional of a fishery, but here may be some interest, so that will be virtual. Then there is going to be a meeting in conjunction with the Mid-Atlantic Council meeting in New York the first week of June.

As the different states come up, of course, you know our staffer, Christina Wiegand in particular, will be reaching out to coordinate with you guys and make sure we're doing everything to get the word out. We just really want to stretch, you know. You're seeing the social media posts and newsletters and that sort of thing, the broadcast approach not necessarily bringing out people.

But to the extent you can get out and really touch base with the folks that are engaged in the fishery, and interested in these issues, are likely to make it a good success. We had a lot of North Carolina staffers and others that came to the meetings too, and that was also really beneficial. I think they got a lot out of talking with the fishermen themselves. Very encouraged by how this has kicked off, and hope it continues.

CHAIR WOODWARD: Yes, that is quite an effort, but I think it's going to yield some very important outcomes, mainly the fact that just getting out and interacting with the people that are affected by our decisions, so that they know that there are real people with real concerns and real interest behind all this magic and voodoo that they see. Any questions for John about the Port Meetings? Chris.

MR. BATSAVAGE: Thank you, John, for going over that. For the New England webinar hearings, are those webinar links posted, just in case myself and any other Board members might be interested in hearing perspectives from the fishermen up in the New England states.

MR. CARMICHAEL: Yes, at this rate they will be posted on our website with all the information about it, yes. We put them there so people can get ready access.

MS. FRANKE: I can send them around to the Board as well.

CHAIR WOODWARD: All right, Jay.

DR. JASON McNAMEE: I think maybe this was just said, so sorry. But we're happy to help do some work up in Rhode Island to drum up some participation, so just let me know when the virtual meetings are, and we will echo that out on our communications and all that good stuff too.

MR. CARMICHAEL: Yes, thank you, Jason, and I think Christine is listening, so Christine, reach out to Jason. Make some contacts there, that will be helpful.

CHAIR WOODWARD: All right, thanks, John.

ADJOURNMENT

CHAIR WOODWARD: We didn't have any other business identified at the beginning of the meeting. Is there anything anybody would like to address under Other Business at this time? We have two minutes. Yes, Emilie.

MS. FRANKE: Switching gears back to Cobia for this Cobia Draft Addendum that has now been approved for public comment. If you will just look out next week for an e-mail from me, asking you all if your state would like to have a public hearing so we can get those scheduled.

CHAIR WOODWARD: Okay, any housekeeping, Bob or Toni, before we break? All right if there is no other business to come before the Pelagics Board, we will stand adjourned.

(Whereupon the meeting adjourned at 11:40a.m. on Wednesday, May 1, 2024)

Atlantic States Marine Fisheries Commission

DRAFT ADDENDUM II TO AMENDMENT 1 TO THE INTERSTATE FISHERY MANAGEMENT PLAN FOR ATLANTIC MIGRATORY GROUP COBIA

Recreational Allocation, Recreational Harvest Target Evaluations, and Measures Setting Timeline

May 2024

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

Public Comment Process and Proposed Timeline

In October 2023, the Coastal Pelagics Management Board initiated the development of Draft Addendum II to Amendment 1 to the Interstate Fishery Management Plan for Atlantic Migratory Group Cobia to consider reallocation of the recreational harvest quota and consider changes to the overall allocation framework. In January 2024, the Board provided additional guidance expanding the scope of the Draft Addendum to address the process for future allocation updates, addressing uncertainty around harvest estimates, and the timeline for setting specifications. This Draft Addendum presents background on the Atlantic States Marine Fisheries Commission's management of the Atlantic cobia recreational fisheries; the addendum process and timeline; and a statement of the problem. This document also provides management options for public consideration and comment.

The public is encouraged to submit comments regarding the proposed management options in this document at any time during the public comment period. The final date comments will be accepted is **July 8, 2024 at 11:59 p.m. (EST).** Comments may be submitted at state public hearings or by mail or email. If you have any questions or would like to submit comment, please use the contact information below. Organizations planning to release an action alert in response to this Draft Addendum should contact Emilie Franke, Fishery Management Plan Coordinator, at efranke@asmfc.org or 703.842.0740.

Mail: Emilie Franke
Atlantic States Marine Fisheries Commission
1050 N. Highland Street, Suite 200 A-N
Arlington VA. 22201

Email: comments@asmfc.org
(Subject: Cobia Draft Addendum II)

Date	Action
October 2023	Board initiated the Draft Addendum
January 2024	Board provided additional guidance on Draft Addendum scope
February – April 2024	Plan Development Team developed Draft Addendum document
May 2024	Board reviewed and approved Draft Addendum II for public comment
Late May – July 8, 2024	Public comment period, including public hearings; written comments accepted through July 8, 2024
August 2024	Board reviews public comment, selects management measures, final approval of Addendum II

Table of Contents

1.0 INTRODUCTION

The Atlantic States Marine Fisheries Commission (Commission) is responsible for managing Atlantic cobia (*Rachycentron canadum*) from Rhode Island through Georgia in state waters (0-3 miles from shore) under the authority of the Atlantic Coastal Fisheries Cooperative Management Act, and has done so through the Interstate Fishery Management Plan for Atlantic Migratory Group Cobia (FMP) since 2017. Atlantic cobia are currently managed under Amendment 1 (2019) to the FMP and Addendum I to Amendment 1 (2020). The states of Rhode Island through Florida, except Connecticut, have a declared interest in the fishery and are responsible for implementing management measures consistent with the Interstate FMP as members of the Coastal Pelagics Management Board. Although Florida has a declared interest in the fishery, their cobia fisheries are managed as part of the Gulf of Mexico Migratory Group Cobia, which is not managed by the Commission, due to the cobia stock boundary at the Georgia-Florida border.

In October 2023, the Board initiated this addendum to address reallocation of recreational cobia quota based on more recent harvest data, recognizing that the distribution of Atlantic cobia harvest has changed since the terminal year in current allocation calculations (2015). In addition, the Board expressed interest in considering alternatives to the current state-by-state allocation system as noted in the approved Board motion from October 2023:

> *Move to initiate an addendum addressing recreational Atlantic cobia quota reallocation. The Board recommends that the Plan Development Team explore options outside of the current state-by-state quota allocation system, specifically a coastwide soft target with regional management measures designed to meet the coastwide soft target while considering the need for fishing opportunity based on the seasonality of the species in various regions.*

In January 2024, the Board provided additional guidance on the scope of the addendum. The Board supported adding options to consider the process for updating allocations in the future, and adding options to consider accounting for uncertainty around harvest estimates. For allocation data timeframes, the Board supported considering 2018-2023 as an option with the exclusion of 2020 due to COVID-19 impacts on data collection. The Board also requested an option to consider a timeline of five years when setting recreational measures.

2.0 OVERVIEW

2.1 Statement of the Problem

The Interstate FMP established state-by-state allocations of the coastwide recreational harvest quota based on harvest data from 2006-2015. At the time of the FMP's approval in 2017, these were the most recent data available to inform allocations. The allocation timeframe did not extend beyond 2015 due to cobia fishery closures in federal waters in 2016-2017 which impacted states' recreational harvests. In 2019, Amendment 1 to the FMP set aside one percent of the recreational harvest quota to account for harvest in *de minimis* states, and each state's allocation percentage was adjusted accordingly to account for that one percent set-aside.

It has been several years since state-by-state allocations were updated. Furthermore, the distribution of cobia landings has changed in recent years and is markedly different from the distribution of state landings observed during the initial allocation data timeframe of 2006-2015. Over the last several years, recreational landings have increased in some Mid-Atlantic states while remaining relatively stable in southern states, indicating a possible range expansion as opposed to a stock shift. Additionally, two states have recently declared into the Atlantic cobia fishery (Rhode Island and New York) due to increasing presence of cobia in state waters. Updating the allocation data timeframe would account for these recent changes in landings and the extent of the fishery. If reallocation is not considered, it is likely that some Mid-Atlantic and *de minimis* states at the northern end of the range will continue to exceed their soft targets resulting in restrictive cobia measures that may not reflect the status of the stock.

In addition to concerns about the outdated allocation data timeframe, there are concerns about continuing to use a state-by-state allocation framework. The Interstate FMP originally implemented the state-by-state allocation framework to provide states with flexibility to adjust management to ensure state access when cobia were available and to suit their specific state needs, while still adhering to the federal catch limits at the time. Due to the high level of uncertainty associated with state-level recreational harvest estimates, there are concerns about continuing to use the state-by-state allocation framework (i.e., performance and management changes based on comparing state harvest estimates to state targets). Cobia harvest estimates from the Marine Recreational Information Program (MRIP) tend to have high percent standard errors (PSEs), which indicates lower precision and higher uncertainty. This is common for species like cobia which is a pulse/rare event fishery with highly variable landings year-to-year resulting from inconsistent interactions with cobia anglers. One way to reduce uncertainty is to increase the sample size, which could be accomplished by considering a regional allocation framework or coastwide allocation framework.

Uncertainty could also be addressed by considering the number of data years included in a rolling average, whether the use of point estimates is appropriate, and/or whether a state or region's performance should be considered on its own or considered relative to other state or region performance (i.e., if one region exceeds their target, and another region is below their target, consider whether that result informs the need for management action).

If cobia harvest continues to increase at the northern end of their range, states that currently have *de minimis* status may exceed that *de minimis* threshold over the next several years. When a state loses its *de minimis* status, it must be factored into the allocation calculations to have its own harvest target. The allocation percentage calculations may also need to change if the allocation source data are updated as part of MRIP's effort to evaluate potential bias in the Fishing Effort Survey (FES) estimates. If these changes to the allocation percentages must be done through the addendum process, that process could take several months. Those changes could be accomplished more quickly if the Board had the ability to make those specific updates to the allocations via Board action, which could be specified in this addendum.

Finally, there is concern about changing management measures too frequently under Amendment 1's specification process which limits specification setting to up to three years at a time. To avoid management 'whiplash', specifications could be set for a longer period of time.

2.2 Background

2.2.1 Status of the Stock

In 2020, the Board approved the SEDAR 58 Atlantic Cobia benchmark assessment for management use. This assessment continued to use the Beaufort Assessment Model (BAM), a forward-projecting statistical catch-at-age model used in the prior assessment, SEDAR 28 (SEDAR, 2013). SEDAR 58, with a terminal year of 2017, provided new reference points (F40% and 75% of SSBF40%). These reference points were selected as they represent the fishing rate and spawning stock biomass (SSB) that allows the population to reach 40% of the maximum spawning potential. These reference points also serve as proxies for maximum sustainable yield-derived relationships due to insufficient data for cobia. Based on those reference points, the stock is not overfished and overfishing is not occurring.

The stock assessment primarily used fishery-dependent data (i.e., data from the recreational and commercial fisheries) as well as information on Atlantic cobia biology, life history, and movement to determine stock condition. The largest changes in SEDAR 58 since the previous assessment included updating data sources with new years of data, updating the natural mortality information, and using newly recalibrated recreational catch and effort data from MRIP.

SEDAR 58 estimated the last strong cobia year class entered the fishery in 2010 (age 1 in 2011) with the four most recent year classes at low levels of recruitment (age 1 in 2014-2017) (SEDAR, 2020). While the SSB remains above the overfished threshold, below-average recruitment led to a decreasing trend in SSB since 2014 (Figure 1). The fishing mortality rate has increased since the late 2000s but has not exceeded the overfishing threshold (Figure 2).

The next stock assessment for Atlantic Migratory Group Cobia (SEDAR 95) is a benchmark assessment currently underway with an estimated completion date of late 2025 or early 2026. The frequency of future stock assessments for Atlantic cobia is uncertain, and the assessment model and methods may change significantly as part of the current assessment, SEDAR 95. The time between completion of the previous stock assessment and the current assessment will be approximately 5-6 years.

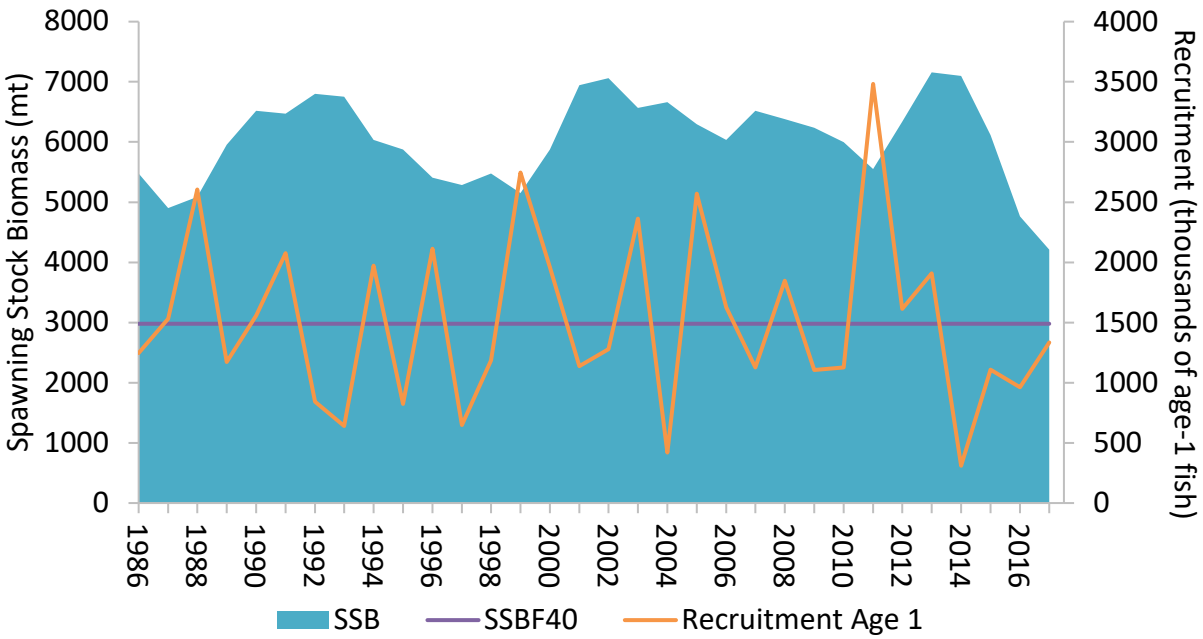


Figure 1. Atlantic Cobia spawning stock biomass (SSB) and recruitment of year 1 fish. (SEDAR, 2020)

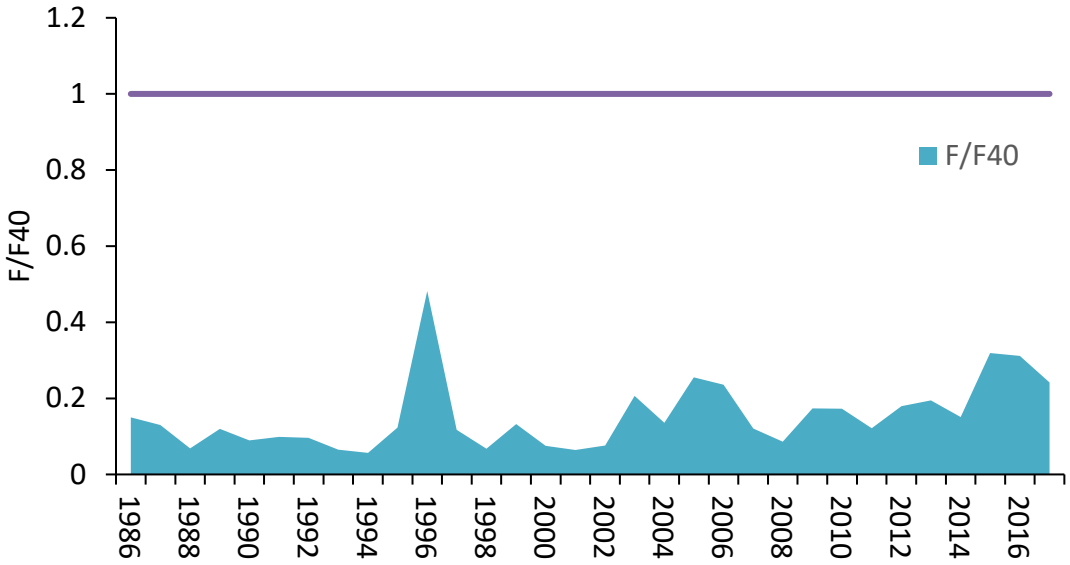


Figure 2. Atlantic Cobia fishing mortality (F) relative to the F40 reference point from 1986-2017. (SEDAR, 2020)

2.2.2 Status of Management

In 2019, Amendment 1 to the Interstate FMP transitioned management of Atlantic cobia from complementary management with the South Atlantic Fishery Management Council to sole management by the Commission. Amendment 1 allows the Board to specify a limited set of management measures for up to three years. This harvest specification process allows managers to specify regulations controlling future harvest through a Board vote, allowing managers to respond quickly to changes in the fishery or react following a stock assessment. Through the harvest specification process, the Board may set the coastwide total harvest quota (combined commercial and recreational harvest), vessel limits, possession or bag limits, minimum size limits, and the commercial closure triggering mechanism for up to three years.

In October 2020, the Board approved Addendum I to Amendment 1, which included modification of the allocation between the commercial and recreational sectors. Addendum I allocates 96% of the coastwide total harvest quota to the recreational sector and 4% of the quota to the commercial sector.

The recreational portion of the total harvest quota is further allocated to non-*de minimis* states as soft harvest targets with a 1% set-aside for harvest in *de minimis* states. Amendment 1 defines the process by which the recreational quota is allocated to non-*de minimis* states where allocations are based on states' percentages of the coastwide historical landings in numbers of fish, derived as 50% of the 10-year average landings from 2006-2015 and 50% of the 5-year average landings from 2011-2015. A 'soft' harvest target means that management measures are adjusted to reduce harvest to the target, but any overage does not need to be paid back. 'Hard' harvest targets (which would have required overage payback) were considered as part of the original Interstate FMP, but soft targets were selected as the management approach.

For the 2024-2026 fishing seasons, the total harvest quota for both sectors combined is 80,112 fish, which is the same harvest quota that has been in place since 2020. The coastwide recreational harvest quota (96% of the total harvest quota) is 76,908 fish. The current management program manages the recreational fishery with a 1 fish bag limit and a minimum size limit of 36 inches fork length (FL) or 40 inches total length (TL) for non-*de minimis* states. Season restrictions and vessel limits are determined by individual states, but may not exceed 6 fish per vessel. Recreational regulations for each state are provided in Appendix A.

Within the coastwide recreational harvest quota, Georgia, South Carolina, North Carolina, and Virginia have the following state recreational harvest targets based on the state-by-state-allocations defined in Amendment 1 to the FMP:

Georgia – 7,229 fish
South Carolina – 9,306 fish
North Carolina – 29,302 fish
Virginia – 30,302 fish

Recreational harvest of state-specific allocations are evaluated over three-year time periods (or when the total harvest quota changes). Each non-*de minimis* state evaluates recent harvest as an average of years with the same recreational management measures against the state-specific soft targets. If a state's averaged recreational harvest exceeds its harvest target, the state must adjust its management measures to reduce harvest to achieve the target, unless otherwise specified by the Board. If a state's harvest is below their target for at least two consecutive years, the state may liberalize management measures, if desired, to achieve its target. Changes to management measures for states with overages or states that wish to liberalize must be reviewed by the Cobia Technical Committee and approved by the Board prior to implementation.

De minimis states collectively have a 1% set-aside of the coastwide recreational quota (769 fish) and are exempt from completing harvest target evaluations. The FMP allows states to request recreational *de minimis* status if their recreational landings in two of the previous three years are less than 1% of annual coastwide recreational landings during that time period. A recreational *de minimis* state may choose to match the recreational management measures implemented by an adjacent non-*de minimis* state (or the nearest non-*de minimis* state if none are adjacent) or limit its recreational fishery to 1 fish per vessel per trip with a minimum size of 33 inches FL (or 37 inches TL).

The commercial fishery has an annual coastwide commercial quota of 73,116 pounds (4% of total harvest quota) for the 2024-2026 fishing seasons, which is the same quota that has been in place since 2020. The current management measures for the commercial fishery include a 33 inches FL (or 37 inches TL) minimum size limit and 2 fish per person limit, with a 6 fish maximum vessel limit. Non-*de minimis* states are required to monitor commercial cobia landings in-season and submit regular landings updates to the Commission. The commercial Atlantic cobia fishery will close once the commercial quota is projected to be reached as determined by the updated Addendum I methodology to calculate the commercial trigger for in-season closures. Commercial regulations for each state are listed in Appendix A.

2.2.3 Status of the Fishery

Note: Since this addendum primarily considers management of the recreational fishery, the following information focuses on Atlantic cobia recreational fisheries. For information on the commercial fishery, see the Review of the FMP for Atlantic Cobia: 2022 Fishing Year (ASMFC 2023).

Recreational harvest has fluctuated throughout the time series, often in rapid increases or declines. Average recreational harvest over the entire time series (1981-2023) is 1.1 million pounds, or about 40,557 fish (Figure 3). More recently, recreational harvest has increased to the series high of 113,939 fish coastwide in 2018, before decreasing to an average of 86,326 fish from 2018-2023.

Recreational releases of live fish have generally increased throughout the time series (Figure 3). In 2023, 248,890 recreationally-caught fish were released, a 31% increase from 2022. This

coincides with the increase in recreational landings in 2023 from 2022. From 2018-2023, an average 76% of cobia caught recreationally were released alive each year. This is higher than the average 65% released alive during the period of 2013-2017.

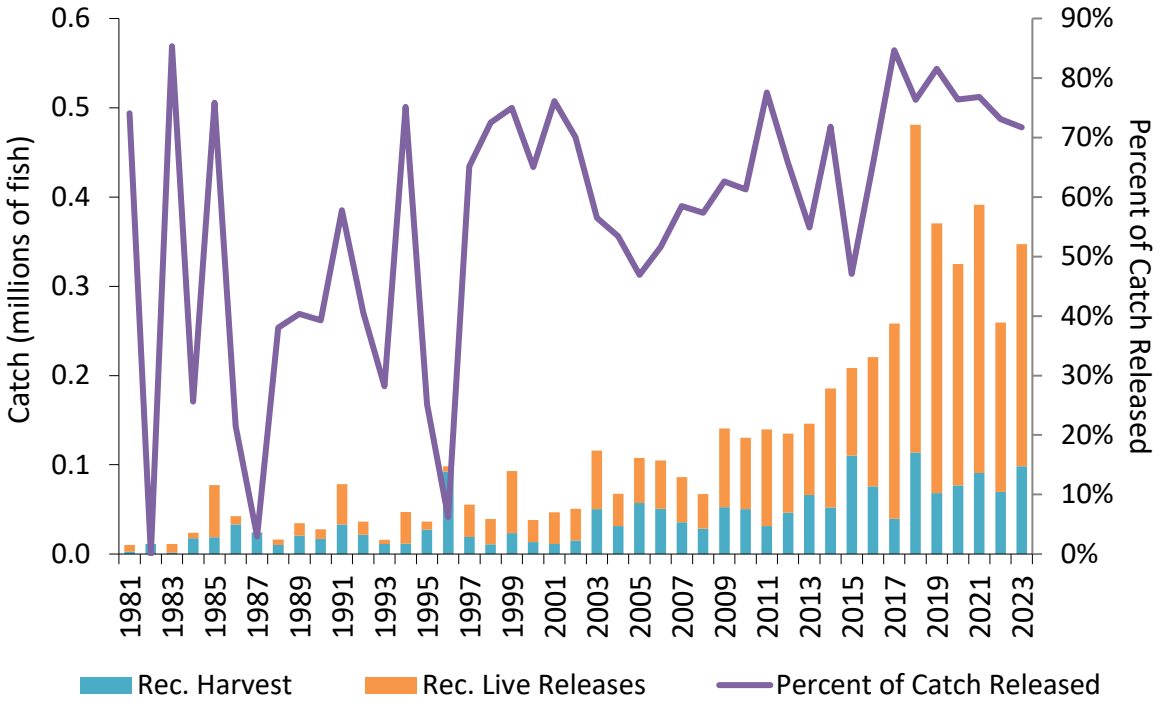


Figure 3. Recreational catch (harvest and live releases) of Atlantic cobia (numbers) and the proportion of catch that is released. Source: Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division (MRIP Query April 2024).

From 2018-2023, Virginia has harvested the majority of the coastwide recreational cobia, with an average of 70.1% of the total fish by count (average of 60,894 fish/year) (Table 1, Figure 4). North Carolina has the second highest recreational harvest with an average of 14.5% of the total fish by count (average of 12,403 fish) for the same timeframe. South Carolina and Georgia have averaged 7.1% and 5.6% of the total coastwide harvest annually for the same timeframe (6,058 and 4,838 fish respectively), and the *de minimis* states made up the remainder (2.6% on average annually, 2,134 fish). Over the last several years, recreational landings have increased in some Mid-Atlantic states while remaining relatively stable in southern states, indicating a possible range expansion as opposed to a stock shift (Figure 4). Recent research to project future distributions of Atlantic cobia and their suitable habitat indicates similar trends, with cobia habitat during the summer projected to increase north of Virginia in the future (Crear et al. 2020).

Virginia has harvested above its state recreational target each year since the current state-by-state targets were implemented in 2020 (Table 1). Georgia harvested above their state target in 2021 and 2023. South Carolina has been harvesting just at or under their target each year, while North Carolina has been under their harvest target each year.

From 2018-2023 the *de minimis* states (currently north of Virginia) have exceeded their 1% set-aside in 4 of the past 6 years. The highest harvest by the *de minimis* states for the time period occurred in 2021, with a total of 5,334 fish or 694% of the *de minimis* allocation. This equates to 6% of coastwide landings that year. States north of Virginia currently have recreational *de minimis* status as each of those states' recreational harvest in two of the previous three years was less than 1% of annual coastwide landings. Florida also has recreational *de minimis* status since its fishery targets Gulf of Mexico Migratory Group Cobia (not Atlantic Migratory Group Cobia).

The percent standard errors (PSEs) associated with recreational cobia harvest estimates from MRIP can be quite high due to the pulse/rare event nature of the cobia fishery. Table 2 summarizes the PSEs for each state's recreational cobia harvest estimates over the last six years.

Table 1. Cobia recreational harvest by state in number of fish from 2018-2023 . Source: Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division (MRIP Query April 2024).

Year	RI	CT	NY	NJ	DE	MD	VA	NC	SC	GA	Total Rec. Harvest
2018		569			581	206	80,679	25,331	6,340	233	**113,939**
2019							55,770	10,090	2,381	72	**68,313**
2020		219				1,360	50,287	15,067	7,650	2,203	**76,786**
2021				250		5,084	57,135	10,970	8,858	8,510	**90,807**
2022			3,462	711			39,668	12,330	6,988	6,641	**69,800**
2023	361						81,824	629[+]	4,129	11,368	**98,311**
Soft Target for 2020-24	*769 de minimis set-aside*						*30,302*	*29,302*	*9,306*	*7,229*	***76,908***

[+]Note: North Carolina Division of Marine Fisheries (NCDMF) staff looked into the very low harvest estimate for 2023 and found that windy weather limited the number of fishable days, and cobia were available for about a week. Data showed that MRIP intercepts in North Carolina were considerably lower in 2023 (38) compared to 2019 (85), 2021 (60), and 2022 (78). NCDMF staff noted that the low harvest estimate is also likely influenced by high percent standard error (PSE) because cobia is a rare event species and a pulse fishery.

Table 2. Percent standard error (PSE) for each state's recreational cobia harvest estimate in number of fish from 2018-2023. Red indicates a PSE greater than 50 (MRIP does not support use of the estimate). Yellow indicates a PSE between 30 and 50 (MRIP cautions use of the estimate in fisheries management). Source: Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division (MRIP Query April 2024).

Year	RI	CT	NY	NJ	DE	MD	VA	NC	SC	GA
2018		100.4			98.1	66.7	35.8	33.2	42.2	53.9
2019							22.6	38.6	70.6	56.9
2020		102.7				69.5	25.0	37.9	39.1	92.4
2021				92.4		43.8	22.9	39.1	41.9	41.4
2022			82.3	102.2			25.1	47	55.9	72.4
2023	71.9						34.2	53.1	61.9	56.0

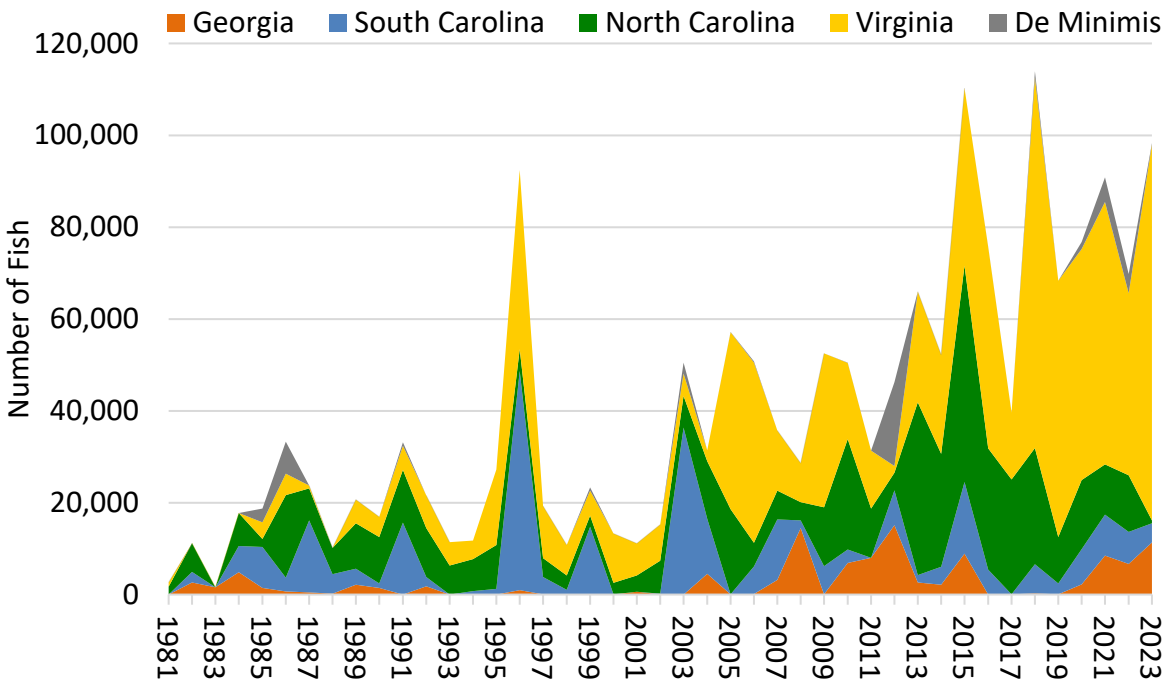


Figure 4. Cobia recreational harvest by state in number of fish. *De minimis* states are states north of Virginia. Source: Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division (MRIP Query April 2024).

The availability of cobia, and therefore harvest timing, differs along the coast. From 2018-2023 (excluding 2020), the percent of recreational harvest peaked in wave 3 for Georgia, South Carolina, and North Carolina at approximately 70% of their total recreational harvest (Figure 5). Total recreational harvest peaked in wave 4 for Virginia (~60% of its recreational harvest). For states north of Virginia, all of which are *de minimis* states, harvest has not been observed every year. When harvest has been observed during this time period, most of Maryland's recreational harvest and all recreational harvest in Delaware, New York, Connecticut, and Rhode Island occurred during Wave 4, while all recreational harvest has occurred during wave 5 for New Jersey during the same time period.

The distribution of total catch throughout the year is slightly different than the distribution of harvest for some states. For Georgia, South Carolina, and North Carolina, total catch in 2018-2023 (excluding 2020) was more spread out among Waves 3, 4, and 5, as compared to consistent peaks in Wave 3 for harvest (Figure 6). Virginia's total catch is more evenly spread between Waves 3 and 4, as compared to a sharper harvest peak in Wave 4. For states north of Virginia, most catch has been observed during Wave 4, with New Jersey seeing catch only in Wave 5 in the most recent years.

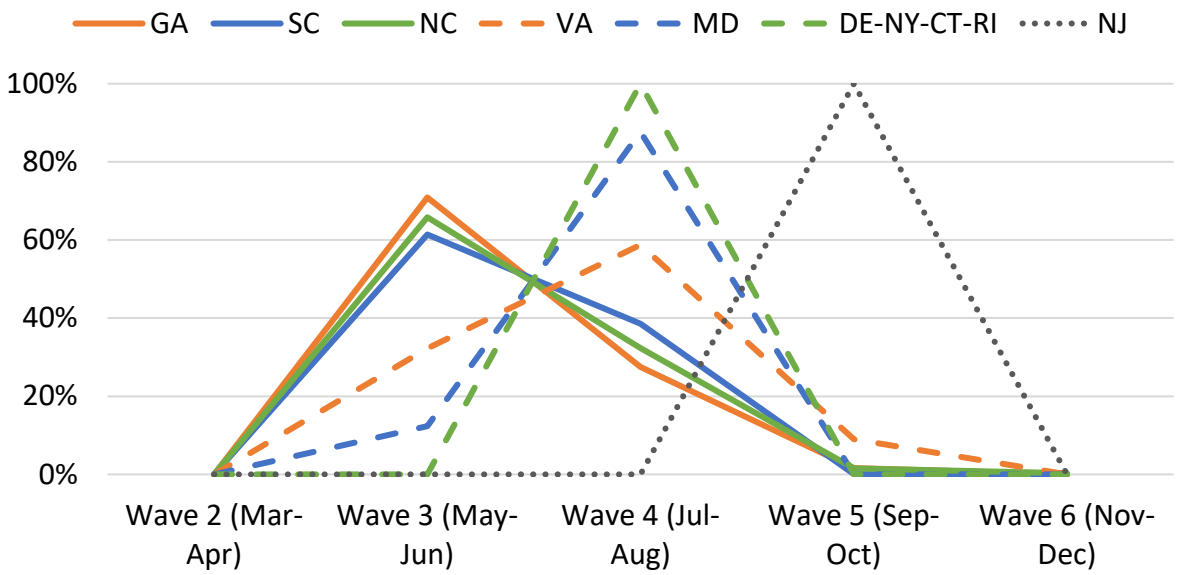


Figure 5. Percent of harvest of Atlantic cobia in numbers per wave from 2018-2023 (excluding 2020). Note: MRIP sampling does not occur in any state during Wave 1 (Jan-Feb) except for North Carolina. North Carolina's estimated cobia harvest during Wave 1 for this time period was 0 fish. Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division (MRIP Query April 2024).

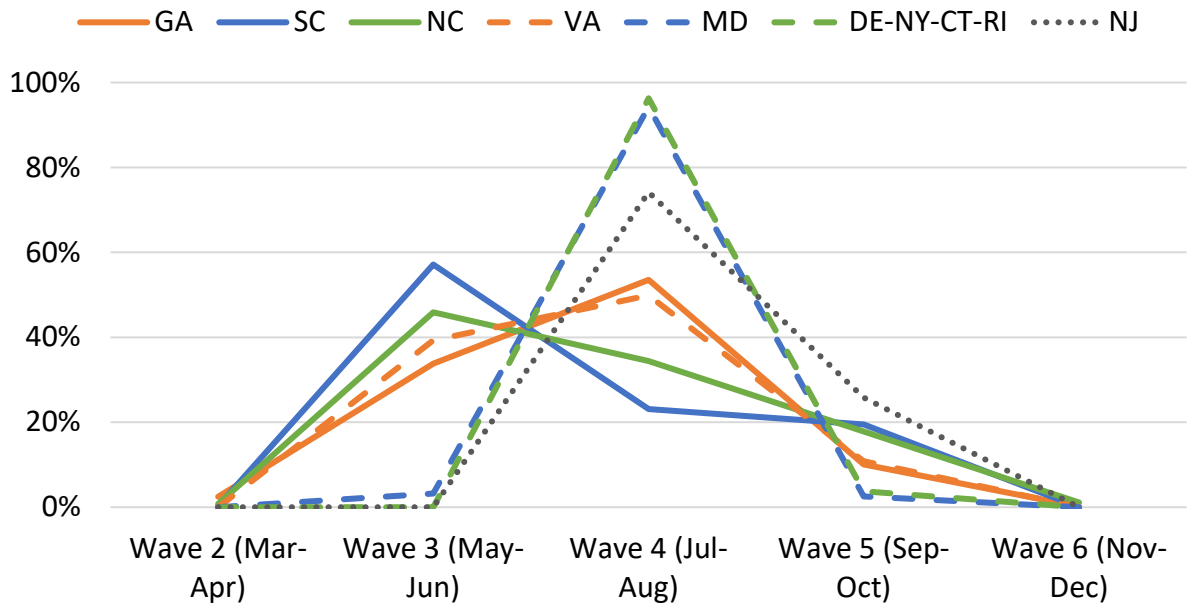


Figure 6. Percent of catch of Atlantic cobia in numbers per wave from 2018-2023 (excluding 2020). Note: MRIP sampling does not occur in any state during Wave 1 (Jan-Feb) except for North Carolina. North Carolina's estimated cobia harvest during Wave 1 for this time period was 0 fish. Source: Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division (MRIP Query April 2024).

2.2.3.1 MRIP Study of Fishing Effort Survey Bias

In August 2023, NOAA Fisheries released findings of a pilot study it conducted to evaluate potential sources of bias in the recreational Fishing Effort Survey (FES) questionnaire design. This study found switching the sequence of questions in the survey resulted in fewer reporting errors and fishing effort estimates that were generally 30 to 40% lower for shore and private boat modes compared to estimates produced from the current design. However, results varied by state and fishing mode, and impacts on a pulse fishery such as cobia are unknown. These results are based on a pilot study that had a limited time frame (six months) and geographic scope (only four states included). Additional extensive work needs to be done to determine the true impacts of the survey design. NOAA Fisheries is conducting a larger-scale follow-up study over the course of the next few years. At this time, the potential impacts to recreational catch estimates and stock assessments are unknown.

Recent landings information suggests that Atlantic cobia are extending their range northward. Specifically, *de minimis* states have exceeded the 1% *de minimis* set-aside every year between 2020 and 2022, and landings in Mid-Atlantic states have increased over the timeseries. Given these trends in landings, unknown impacts of the FES follow-up study, and lack of updated cobia stock assessment projections, this Draft Addendum is being considered *prior to* potential updates to MRIP catch estimates. A new benchmark stock assessment for Atlantic cobia will be completed by 2026 and could explore how a possible overestimation of recreational catch may

impact cobia biomass. Additionally, this Draft Addendum presents an option that would allow allocations to be quickly updated under certain circumstances, such as potential updated MRIP catch estimates from this study.

2.2.3.2 Summary of Non-*De Minimis* State Fisheries

Virginia: Virginia's recreational cobia fishery has grown substantially since 2016. Two of the main fishing methods are sight-casting and pier fishing. Sight-casting from custom towers on the top of boats has become more popular than the traditional method of bottom fishing. This shift could be tied to an increase in effectiveness of targeting cobia via sight-casting because of their feeding habits and tendency to swim in schools on the surface of the water. There is also a shore-specific fishery for cobia from the four large piers found within coastal Virginia. While cobia are available, effort will increase on piers as the fish are moving through different parts of the Chesapeake Bay and oceanfront. Anglers will target cobia when they are accessible from the piers, but effort will decrease to almost zero once the fish have migrated to other areas.

While other states may experience pulses of abundance in cobia as they migrate up and down the Atlantic coast, cobia can be found in Virginia waters from mid-May through mid-October. This continuous season in Virginia attracts anglers traveling from out of state to target cobia, contributing to the already large yearly catches from residents. Even with the continuous season, catch peaks from May-June when the fish enter the Bay, and again in August-September as they leave the Bay.

From 2016-2022, Virginia operated the Recreational Cobia Mandatory Reporting Program (RCMRP), a monitoring program to survey recreational cobia anglers. The RCMRP required a free cobia permit for all captains or operators of vessels, as well as those who fished without a vessel (i.e. from a shore, pier, etc.). All permittees were responsible for reporting their cobia activity during the recreational season. Recreational reporting for cobia harvest and releases was mandatory, but revocation of permits was not enforced during the beginning stages of development. Due to low reporting rates, in 2019, reporting became mandatory with revocation to increase reporting rate. That is, permittees who did not report their participation in the recreational cobia fishery within 21 days after the close of the season were ineligible for the following year's recreational cobia permit. At the peak of the program in 2020, there were 8,256 permit holders submitting 12,307 trips total, with a catch of 24,020 cobia (includes kept and released fish). Ultimately the RCMRP was ended in 2022 due to unnecessary burden on recreational anglers. Since the data were not statistically sound enough for any stock assessment use, the program changed to voluntary reporting to try to fill the gap for recreational release data.

North Carolina: In North Carolina, the recreational cobia fishery is seasonal, with cobia primarily available in state waters from late spring through early fall. Cobia are landed mostly in the spring and summer months corresponding with their spring spawning migration (Smith, 1995). Peak landings occur during the latter part of May into June and quickly diminish thereafter. However, recreational landings of cobia can occur through October. Historically,

recreational fisherman targeted cobia from a vessel by anchoring and fishing with dead, live, or a mixture of both bait types near inlets and deep water sloughs inshore (Manooch, 1984). In the early 2000s, fishermen began outfitting their vessels with towers to gain a higher vantage point to spot and target free-swimming cobia along tidelines and around bait aggregations. This method of fishing actively targets cobia in the nearshore coastal zone and has become the primary mode of fishing in most parts of the state.

Despite increased fishing pressure due to a growing number of charter and recreational boats, North Carolina recreational cobia landings have been lower the last couple years relative to previous years. Weather conditions, including persistent winds, have hindered fishing efforts by reducing the number of fishable days. The North Carolina cobia fishery is a pulse fishery, with the primary wave of fish historically arriving in early June and being available for about 6 weeks. In recent years, anecdotal observations suggest the cobia are migrating to Chesapeake Bay much earlier, in April and May, and are residing in North Carolina for a shorter period of time, possibly influenced by temperatures and/or currents.

South Carolina: South Carolina's recreational cobia fishery occurs in both nearshore waters and around natural and artificial reefs offshore. Historically, the majority of cobia landings have occurred in state waters in and around spawning aggregations from April through May. However, due to intense fishing pressure in the inshore zone, annual landings of cobia have fallen drastically since 2009, such that the majority of recreationally caught cobia in South Carolina now come from offshore (federal) waters. Legislative action was taken in 2016 to help protect the inshore fishery by putting a no take of cobia during the month of May, their peak spawning period inshore, within state waters south of Edisto Island. This has also helped shift fishing effort offshore. Due to the size increase from 33 inches FL to 36 inches FL in 2018, most of the captured cobia are under the size limit and are released. Anglers begin targeting cobia in late April-early May with the peak of the season typically occurring May into early June. Late season catches can occur on nearshore reefs through October depending on water temperatures. Additionally, anglers have seen an increase in shark predation over the past few years.

Georgia: A large recreational fishery exists for cobia in Georgia. Most of this fishery occurs in nearshore waters around natural and artificial reefs. While there are some instances of cobia being caught inshore and on beach front piers in Georgia, most landings come from federal waters. Georgia anglers generally begin targeting cobia in late April with peak harvest occurring in May/June. Anglers continue to catch cobia off Georgia through August, and data from MRIP shows that catch of cobia off Georgia peaks during Wave 4 (July-August). There are anecdotal reports of late season (October-December) catch that sometimes occurs on nearshore reefs depending on water temperatures. These are likely migratory fish that are moving back through waters off Georgia as they head south from areas north of Georgia. However, these fall runs are sporadic and may not be observed in MRIP data.

Some evidence suggests there may be two distinct groups of cobia that occur in waters off Georgia. One, a north/south migrating group of fish that appears in early spring as part of their

northward migration. This group of fish may account for the peak in landings that occurs in May/June in Georgia's cobia fishery. And the second, a group of east/west migrating fish that are present off Georgia through the summer months that then retreat to deeper offshore waters to overwinter along the edge of the continental shelf. This theory is supported by the persistence of fish off Georgia well into the summer months (July/August) and after the northward migrating group of cobia has moved out of Georgia waters and into regions north of Georgia.

3.0 PROPOSED MANAGEMENT PROGRAM

Draft Addendum II proposes options regarding:

- recreational allocation framework (Section 3.1);
- updates to allocations (Section 3.2);
- data and uncertainty in recreational landings evaluation (Section 3.3);
- overage response for recreational landings evaluation (Section 3.4); and,
- timeline for setting specifications (Section 3.5).

When the Board takes final action on the addendum, there is the opportunity to select any measure within the range of options that went out for public comment, including combining options across issues.

3.1 Recreational Allocation Framework

The following options would determine how recreational quota is allocated among states (Options A-B), regions (Option C), or coastwide (Option D).

The options consider two different data timeframes as the basis for allocation. One timeframe considers only the most recent six years of harvest data, while the other timeframe considers a weighted combination of the most recent six years plus the last ten years of harvest data. Including the ten-year component gives some consideration to previous harvest distribution before the majority of harvest shifted north.

For all timeframe options, 2016, 2017, and 2020 recreational catch data were excluded from the calculations. Cobia closures in federal waters and some states' waters during 2016 and 2017 resulted in those years being excluded from allocation calculations. Similarly, 2020 was excluded due to COVID-19 impacts on MRIP sampling and use of imputed data for 2020 recreational harvest estimates.

For state-by-state allocation frameworks (Options A-B), *de minimis* states do not have an allocation based on landings, but rather have a set-aside to account for landings across all *de minimis* states. *De minimis* states are exempt from completing harvest target evaluations and have a separate set of standard recreational measures from which to choose. *De minimis* states must request *de minimis* status each year through the compliance report process. The FMP allows states to request recreational *de minimis* status if their recreational landings in two of the previous three years are less than 1% of annual coastwide recreational landings during that time period.

For a regional (Option C) or coastwide (Option D) allocation framework, states could still request *de minimis* status for the recreational fishery, however, *de minimis* states would be part of a larger region subject to regional or coastwide harvest target evaluations. *De minimis* states would be subject to the management measures determined for that region or the coast. So, the current default *de minimis* measures would become irrelevant.

For all allocation framework options, conservation equivalency (CE) is not allowed. The state-by-state allocation framework already affords each state the flexibility to decide how to adjust their management measures to meet their target. The objective of a regional or coastwide allocation framework is to achieve consistent measures within a region or coastwide if a future reduction or liberalization is needed. Seasons could vary within a region or along the coast based on cobia availability, but the size limit and vessel limit would need to be consistent among all states in a region or coastwide. Currently, size limits are mostly consistent among states, with the exception of *de minimis* states. Preliminary vessel limit analysis indicates anglers in states with higher vessel limits are not harvesting their full limit, so reducing vessel limits in those states to be consistent with others in the region or coastwide would not significantly reduce harvest.

It is important to note that upcoming changes to the MRIP Fishing Effort Survey (FES) estimates may affect the state-by-state and regional allocation percentages presented in the below options. If MRIP FES estimates for cobia are changed in the future, associated updates to the selected allocations would need to be considered.

Option A. Status Quo State-By-State Harvest Allocations

Under this option, the recreational quota for Atlantic cobia would continue to be allocated on a state-by-state basis as outlined in Amendment 1. Percentage allocations are based on states' percentages of the coastwide historical landings in numbers of fish, derived as 50% of the 10-year average landings from 2006-2015 and 50% of the 5-year average landings from 2011-2015. To account for harvests in *de minimis* states, 1% of the recreational quota is set aside.

The recreational landings evaluation process and resulting required changes to state measures would proceed as outlined in Amendment 1.

Option B. Updated State-By-State Harvest Allocations

Under this option, recreational quota would continue to be allocated on a state-by-state basis, including a set-aside for *de minimis* states. The allocations in this option include recent data and thereby reflect changes seen in harvest distribution, and the *de minimis* set-aside is increased to 5% to account for increased harvest in *de minimis* states in recent years. This option considers two allocation timeframes outlined in options B1 and B2.

If this option is selected, recreational management measures would remain status quo in each state until completion of the next stock assessment (SEDAR 95), or until a state needs to take a reduction based on evaluation of the state's landings against its harvest target, whichever comes first. States would not be able to liberalize measures before completion of SEDAR 95.

If a state needs to change management measures, the state would work with the Cobia Technical Committee to propose a set of management measures to meet the reduction or, after completion of SEDAR 95, the liberalization. Changes to management measures must be reviewed by the Technical Committee and approved by the Board prior to implementation. Options B1 and B2 include a 5% set-aside of the recreational quota to account for harvests in *de minimis* states.

Option B1. Five-Year Average Allocation Timeline
Recreational quota allocated state-by-state based on states' percentages of the coastwide historical landings in numbers of fish, derived as 100% of 6-year average landings from 2018-2023 (excluding 2020).

Option B2. Weighted Ten-Year and Five-Year Average Allocation Timeline
Recreational quota allocated state-by-state based on states' percentages of the coastwide historical landings in numbers of fish, derived as 50% of 10-year average landings from 2014-2023 (excluding 2016, 2017, 2020) and 50% of the 6-year average landings from 2018-2023 (excluding 2020).

Table 3. State-by-state recreational allocation options.

Data Timeframe	**Status Quo** **50% 2006-2015 + 50% 2011-2015**	**6-Year Average** **100% 2018-2023**	**Weighted 10-Year & 6-Year Average 50% 2014-2023 + 50% 2018-2023**
	Option A	**Option B1**	**Option B2**
***De minimis* Set-Aside**	1%	5%	5%
Virginia	39.4%	69.2%	64.5%
North Carolina	38.1%	13.2%	17.4%
South Carolina	12.1%	6.5%	7.1%
Georgia	9.4%	6.1%	6.0%
Total	100%	100%	100%

Option C. Regional allocations

Under this option, recreational quota would be allocated among regions. Recreational management measures in a region would eventually need to consist of the same size limit and vessel limit for all states in the region. Seasons may differ among states in a region.

Currently, vessel limits and seasons vary by state along the coast. Size limits are mostly uniform with the exception of *de minimis* states that have adopted the default *de minimis* measures specified in the FMP. If this regional allocation option is selected, recreational management measures would remain status quo in each state until completion of the next stock assessment (SEDAR 95), or until a region needs to take a reduction based on evaluation of the region's landings against the harvest target, whichever comes first. At that time, the states in the region would work with the Cobia Technical Committee to determine a set of management measures for all states in the region to meet the reduction (i.e., uniform size limit and vessel limit; seasons may differ). Regions would not be able to liberalize measures before the completion of SEDAR 95. Changes to management measures must be reviewed by the Technical Committee and approved by the Board prior to implementation.

Option C considers dividing the coast into two regions, with sub-options considering:

- which states are in each region, and
- two different allocation timeframes based on historical landings in numbers of fish:
    - 6-Year Average. 100% of 6-year average landings from 2018-2023 (excluding 2020);
    - Weighted 10-year/6-year Average. 50% of 10-year average landings from 2014-2023 (excluding 2016, 2017, 2020) and 50% of the 6-year average landings from 2018-2023 (excluding 2020);

This results in a total of four options as outlined in Table 4. Options C1-C2 consider a southern region of South Carolina and Georgia, while Options C3-C4 consider a southern region of North Carolina, South Carolina, and Georgia. The percent standard error and the regional harvest with associated confidence intervals are available in Appendix B.

Options C1 and C2. Two Region Allocation – Northern Region (RI through NC) and Southern Region (SC and GA)

Options C1 and C2 consider two regions where the northern region consists of the states from Rhode Island through North Carolina, and the southern region consists of South Carolina and Georgia with the above noted allocation timeframes and detailed in Table 4.

Option C3 and C4. Two Region Allocation – Northern Region (RI through VA) and Southern Region (NC through GA)

Options C3 and C4 consider two regions where the northern region consists of the states from Rhode Island through Virginia and the southern region consists of the states from North Carolina through Georgia with the above noted allocation timeframes and detailed in Table 4.

Table 4. Regional recreational allocation options.

Data Timeframe	6-Year Average 100% 2018-2023	Weighted 10-Year & 6-Year Average 50% 2014-2023 + 50% 2018-2023
	Option C1	**Option C2**
Northern Region RI-CT-NY-NJ-DE-MD-VA-NC	87.24%	86.65%
Southern Region Two State SC-GA	12.76%	13.35%
Total	100%	100%
	Option C3	**Option C4**
Northern Region RI-CT-NY-NJ-DE-MD-VA	73.77%	68.69%
Southern Region Three State NC-SC-GA	26.23%	31.31%
Total	100%	100%

Option D. Coastwide Target

Under this option, there would be no state-specific or regional harvest targets, but rather only the coastwide recreational harvest quota. A coastwide size limit and vessel limit would eventually be established for all states, but the season may be different for each state or group of states based on cobia availability in each state. 'Coastwide' for Atlantic cobia refers to states north of the Georgia-Florida border.

Currently, vessel limits and seasons vary by state along the coast. Size limits are mostly uniform with the exception of *de minimis* states that have adopted the default *de minimis* measures specified in the FMP. If this coastwide allocation option is selected, recreational management measures would remain status quo in each state until completion of the next stock assessment (SEDAR 95), or until the coast needs to take a reduction based on evaluation of the coastwide landings against the coastwide harvest quota, whichever comes first. At that time, all states would work with the Cobia Technical Committee to determine a set of management measures for all states along the coast to meet the reduction (i.e., uniform size limit and vessel limit; seasons may differ). The coast would not be able to liberalize measures before the completion of SEDAR 95. Changes to management measures must be reviewed by the Technical Committee and approved by the Board prior to implementation.

3.2 Updates to State/Regional Recreational Allocations

Option A. Status Quo.
Under this option, recreational allocations can only be changed through the ASMFC addendum process.

Option B. Allocation Changes via Board Action
Under this option, the Board may change recreational allocations via Board action (i.e., voting at a Board meeting; no addendum needed) in the following scenarios:

- A state loses *de minimis* status and therefore needs to be allocated a state-specific harvest target (only applicable under a state-by-state allocation framework).
- Harvest estimates for the allocation source data years are revised (i.e., if MRIP estimates are updated).

If the Board is considering changing allocation via Board action under one of the above scenarios, the Cobia Technical Committee would re-calculate allocations based on the associated scenario and bring the new allocations to the Board for consideration. In the case of a state losing *de minimis* status, the Technical Committee will calculate the new allocations to be presented to the Board at the Commission's Summer Meeting. Following the Summer Meeting when the Board considers state *de minimis* requests for that year, the Board could approve new allocations at the Commission's Annual Meeting in the fall. This faster process of Board action, as compared to the longer addendum process, would be more efficient to address the above scenarios, which could occur multiple times over the next several years.

If the Board would like to consider allocation changes outside the scenarios listed above, an addendum is needed to change state/regional recreational allocations.

3.3 Data and Uncertainty in Recreational Landings Evaluations

Option A. Status Quo.
Under this option, MRIP harvest point estimates and up to a three-year rolling average would continue to be used for comparing recreational harvest to harvest targets.

Recreational landings for each non-*de minimis* state (or each region or the coast depending on allocation framework selected in Section 3.1) will be evaluated against that state's/region's/ coastwide target as an average of annual landings. The timeframe for this average will only include years with the same management measures (i.e., measures have not changed from year to year). If the same management measures have been in place for at least three years, the timeframe will include the three most recent years under these regulations (a rolling 3-year average). If the same management measures have been in place for less than three years, the timeframe will include all years under the same regulations.

If a regional or coastwide framework is selected, states in each region or coastwide will have different management measures from each other until the measures are changed to a uniform set of measures (same size and vessel limit; seasons may differ) when a reduction or liberalization occurs. This does not affect the evaluation. This does not affect the evaluation; the evaluation timeframe only depends on if measures have changed from year to year, not if they differ between states.

Option B. Extend Rolling Average to Five Years

Under this option, MRIP harvest point estimates would continue to be used for comparing recreational harvest to harvest targets, but the rolling average timeframe would extend to five years. This allows for inclusion of additional data years, which can be more informative given the variability in and sometimes imprecision of cobia landings from year to year.

Recreational landings for each non-*de minimis* state/region/coastwide would be evaluated against that state's/region's/coastwide target as an average of annual landings. The timeframe for this average will only include years with the same management measures (i.e., measures have not changed from year to year). If the same management measures have been in place for at least five years, the timeframe will include the five most recent years under these regulations (a rolling 5-year average). If the same management measures have been in place for less than five years, the timeframe will include all years under the same regulations.

If a regional or coastwide framework is selected, states in each region or coastwide will have different management measures from each other until the measures are changed to a uniform set of measures (same size and vessel limit; seasons may differ) when a reduction or liberalization occurs. This does not affect the evaluation; the evaluation timeframe only depends on if measures have changed from year to year, not if they differ between states.

Provision on the Use of Confidence Intervals

If a regional or coastwide allocation framework is selected, the Board could decide in the future (via Board vote) to switch from a rolling average approach to a confidence interval approach for harvest target evaluation. This provision gives the Board the ability to make that switch in the future via Board vote. Using confidence intervals instead of a rolling average for evaluation would more directly account for the uncertainty around the MRIP harvest point estimates.

The confidence interval approach would require PSEs and confidence interval values for the regional or coastwide sum total harvest estimates, which are currently only available via MRIP's custom data request process. The confidence interval approach cannot be used for a state-by-state allocation framework due to larger confidence intervals around some state-specific estimates.

For this approach, when regional or coastwide harvest is evaluated against the harvest target to determine if a change is needed, the Cobia Technical Committee would consider the 95% confidence intervals associated with MRIP harvest point estimates for the evaluation timeframe. If the same management measures have been in place for at least three or five

years (depending on whether the Board selects a three- or five-year approach above), the timeframe will include the most recent three or five years under these regulations. If the same management measures have been in place for less than three or five years, the timeframe will include all years under these regulations.

If the harvest estimate's lower bound confidence interval is above the harvest target for a majority of the years within the evaluation timeframe, this indicates harvest has been above the target, and the region/coast must adjust its management measures to reduce harvest to achieve the target. If the harvest target falls within the harvest estimate's confidence interval for a majority of the years within the evaluation timeframe, status quo measures may be maintained. If the harvest estimate's upper bound confidence interval is below the harvest target for a majority of the years within the evaluation timeframe, this indicates harvest has been below the target, and the region/coast may adjust its management measures to liberalize harvest such that the target level of harvest is achieved, but not exceeded. To calculate the reduction or liberalization needed, the average landings over the evaluation time period will be used relative to the target.

A majority of years within the evaluation timeframe means three out of five years or two out of three years. In the event of one out of two years or two out of four years, the Technical Committee will make a recommendation for Board consideration of a reduction or maintaining status quo measures.

To address years with particularly large confidence intervals (i.e., high uncertainty), years that have harvest estimates with a PSE greater than 50 would not be included in the evaluation. Years that have harvest estimates with PSEs between 30 and 50 would be subject to review by the Cobia Technical Committee to recommend whether they are appropriate to include in the evaluation. This aligns with MRIP's guidance to use caution for estimates with a PSE greater than 30, and not support the use of estimates with a PSE greater than 50.

3.4 Overage Response for Recreational Landings Evaluations with Rolling Averages

Option A. Status Quo.
Under this option, the need for changes to recreational management measures is determined at the individual state level by comparing state harvest to that state's harvest target over the evaluation period.

If a state's (or region's or coastwide if selected in Section 3.1) averaged recreational landings exceed its annual recreational harvest target, that state/region/coast must adjust its recreational vessel limit or season to reduce harvest, such that future annual landings would be expected to achieve the state/regional/coastwide recreational harvest target.

States/regions/coast reporting a consistent (i.e., consecutive) under-harvest during an evaluation time period for a minimum of 2 years may present a plan to extend seasons or

increase vessel limits, if desired, to allow increased harvests that will not exceed the harvest target.

Changes to management measures for states with overages or states that wish to liberalize management measures must be reviewed by the Technical Committee and approved by the Board prior to implementation.

Option B. Performance Comparisons

Under this option, if a state/region's averaged recreational landings exceed its annual recreational harvest target, management action to reduce harvest in that state/region would not be required if the following conditions are met:

- another state/region's averaged recreational landings is under their target by at least the same amount, and that state has chosen not to liberalize their measures (if applicable); AND
- the average coastwide harvest has not exceeded the coastwide quota for the same timeframe.

Otherwise, the process remains the same as in Option A.

This performance comparison approach cannot be used in conjunction with the confidence interval approach outlined in section 3.3. If the confidence interval approach is implemented in the future, this performance comparison approach can no longer be used at that time.

3.5 Timeline for Setting Commercial and Recreational Measures

Option A. Status Quo.

Under this option, the coastwide total harvest quota, vessel limits, possession or bag limits, minimum size limits, and a commercial closure triggering mechanism may be specified through Board action **for up to three years**.

New specified recreational management measures may be implemented after the expiration of previously specified measures or following a completed stock assessment. In years when harvest specifications are made, they will occur no later than the Fall Board meeting, and resulting measures will be implemented in the following year. Recreational landings will be evaluated against state recreational harvest targets at the same time (i.e., at the same meeting) as the specification process.

Option B. Five-Year Specifications

Under this option, the coastwide total harvest quota, vessel limits, possession or bag limits, minimum size limits, and a commercial closure triggering mechanism may be specified through Board action **for up to five years**. The rest of the specification process would remain the same as Option A.

A longer five-year timeline would potentially reduce the frequency of management changes (management 'whiplash') and better aligns with when new stock assessment information is likely to be available for Atlantic cobia. The time between completion of the previous stock assessment and the current assessment will be approximately 5-6 years. Setting new specifications between assessments can be difficult due to the lack of new information on stock status. For example, the 2020-2023 specifications were informed by the SEDAR 58 stock assessment (2020). When those specifications expired, the Board considered specifications for 2024-2026. Since neither a new stock assessment nor stock projections beyond 2024 were available, the Technical Committee and Board had limited information to consider for the 2024-2026 specifications.

4.0 COMPLIANCE SCHEDULE

TBD upon approval of Addendum II.

5.0 REFERENCES

Atlantic States Marine Fisheries Commission (ASMFC). 2023. Review of the Interstate Fishery Management Plan For Atlantic Cobia (*Rachycentron canadum*): 2022 Fishing Year. Arlington, Virginia. 21 pp. Available online at: http://www.asmfc.org/uploads/file/64da73a8CobiaFMPReview_FY2022.pdf

Crear, Daniel P., B.E. Watkins, V.S. Saba, J.E. Graves, D.R. Jensen, A.J. Hobday, and K.C. Weng. 2020. Contemporary and future distributions of cobia, *Rachycentron canadum*. Biodiversity Research 26(8):1002-1015.

Manooch, Charles S. 1984. Fisherman's guide to fishes of the Southeastern United States. North Carolina Museum of Natural History. Raleigh, North Carolina. 362 pp.

SouthEast Data, Assessment, and Review (SEDAR). 2013. SEDAR 28 – South Atlantic Cobia Stock Assessment Report. SEDAR, North Charleston SC. 420 pp. available online at: https://sedarweb.org/assessments/sedar-28/

SEDAR. 2020. SEDAR 58 – Atlantic Cobia Stock Assessment Report. SEDAR, North Charleston SC. 500 pp. available online at: http://sedarweb.org/sedar-58

Smith, Joseph W. 1995. Life history of cobia Rachycentron canadum (Osteichthyes: Rachycentridae), in North Carolina Waters. Brimleyana 23:1-23

APPENDIX A. 2023 State Management Measures for Atlantic Migratory Group Cobia

State	Recreational Measures	Commercial Measures
RI	*De minimis* Minimum Size: 37 in total length Vessel Limit: 1 fish per vessel Season: year-round	<u>Coastwide</u> Possession Limit: 2 fish per person Minimum Size: 33 in fork length or 37 in total length Vessel Limit: 6 fish If commercial fishing in state waters is closed, commercial fishing in federal waters will be recommended to mirror state closures <u>Deviations</u> -Rhode Island and New York possession limit is 2 fish per vessel -Virginia possession limit is per licensee rather than per person -North Carolina has 36 minimum fork length -No commercial harvest in South Carolina state waters -Georgia possession limit is 1 fish per person (not to exceed 6 per vessel) and minimum size is 36 in fork length
NY	*Declared into the fishery in 2023; could qualify for de minimis* Minimum Size: 37 in total length Vessel Limit: 1 fish per vessel Season: year-round	
NJ	*De minimis* Minimum Size: 37 in total length Vessel Limit: 1 fish per vessel Season: year-round	
DE	*De minimis* Minimum Size: 37 in total length Bag Limit: 1 fish per vessel Vessel Limit: 1 fish per vessel	
MD	*De minimis* Minimum Size: 40 in total length Bag Limit: 1 fish per person Vessel Limit: 2 fish per vessel Season: June 15-September 15	
PRFC	Minimum Size: 40 in total length (only 1 fish over 50” per vessel) Bag limit: 1 per person Vessel Limit: 2 fish per vessel Season: June 15-September 15	
VA	Minimum Size: 40 in total length (only 1 fish over 50” per vessel) Bag Limit: 1 fish per person Vessel Limit: 2 fish per vessel Season: June 15-September 15	

NC	Minimum Size: 36 in fork length Bag Limit: 1 fish per person Season: May 1-December 31 <u>Private Vessel Limit</u> May 1- June 30: 2 fish July 1-Dec 31: 1 fish <u>For-Hire Vessel Limit</u> May 1-Dec 31: 4 fish	
SC	Bag Limit: 1 fish per person Minimum Size: 36 in fork length Vessel Limit: 6 fish Season: Open year-round <u>Southern Cobia Management Zone:</u> Minimum Size: 36 in FL Season: June 1-April 30 (closed in May) Bag Limit: 1 fish per person Vessel Limit: 3 fish -If recreational fishing in federal waters is closed, recreational fishing in all SC state waters is also closed.	
GA	Bag Limit: 1 fish per person Minimum Size: 36 in fork length Vessel Limit: 6 fish Season: March 1-October 31	
***Florida has a declared interest in the Atlantic Coastal Migratory Group, but their cobia fisheries are managed as part of the Gulf of Mexico Migratory Group due to cobia stock boundaries.**		

APPENDIX B. Percent Standard Error (PSE) for State and Regional Harvest Estimates

Table B1. Percent standard error (PSE) for each state's recreational cobia harvest estimate in number of fish from 2014-2023. Red indicates a PSE greater than 50 (MRIP does not support use of the estimate). Yellow indicates a PSE between 30 and 50 (MRIP cautions use of the estimate in fisheries management). Source: Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division (MRIP Query April 2024).

	Corresponds with Section 3.1 Options A-B State-by-State Allocation									
	RI	**CT**	**NY**	**NJ**	**DE**	**MD**	**VA**	**NC**	**SC**	**GA**
2014							42.5	35.8	60.3	71.5
2015							49.3	28.3	48.5	59.9
2016						102.6	18.9	44.9	60	
2017							42.3	46.1		111.4
2018		100.4			98.1	66.7	35.8	33.2	42.2	53.9
2019							22.6	38.6	70.6	56.9
2020		102.7				69.5	25	37.9	39.1	92.4
2021				92.4		43.8	22.9	39.1	41.9	41.4
2022			82.3	102.2			25.1	47	55.9	72.4
2023	71.9						34.2	53.1	61.9	56

Table B2. Percent standard error (PSE) for each proposed region's recreational cobia harvest estimate in number of fish from 2014-2023. Red indicates a PSE greater than 50 (MRIP does not support use of the estimate). Yellow indicates a PSE between 30 and 50 (MRIP cautions use of the estimate in fisheries management). Source: Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division (MRIP May 2024).

Corresponds to Section 3.1	*Options C1-C2 Regional Allocation*		*Options C3-C4 Regional Allocation*		*Option D Coastwide Target*
Year	**RI-NC**	**SC-GA**	**RI-VA**	**NC-GA**	**RI-GA**
2014	27.5	46.4	42.5	30.1	24.9
2015	27.1	37.8	49.3	22.6	22.7
2016	20.6	60.0	18.8	38.6	19.6
2017	33.0	111.4	42.3	46.1	33.0
2018	28.0	40.7	35.2	27.7	26.5
2019	20.0	68.6	22.6	33.8	19.5
2020	20.7	36.7	24.4	27.1	18.7
2021	19.0	29.5	21.2	23.6	16.4
2022	21.2	45.5	23.7	32.7	19.2
2023	33.7	44.3	34.0	42.6	29.3

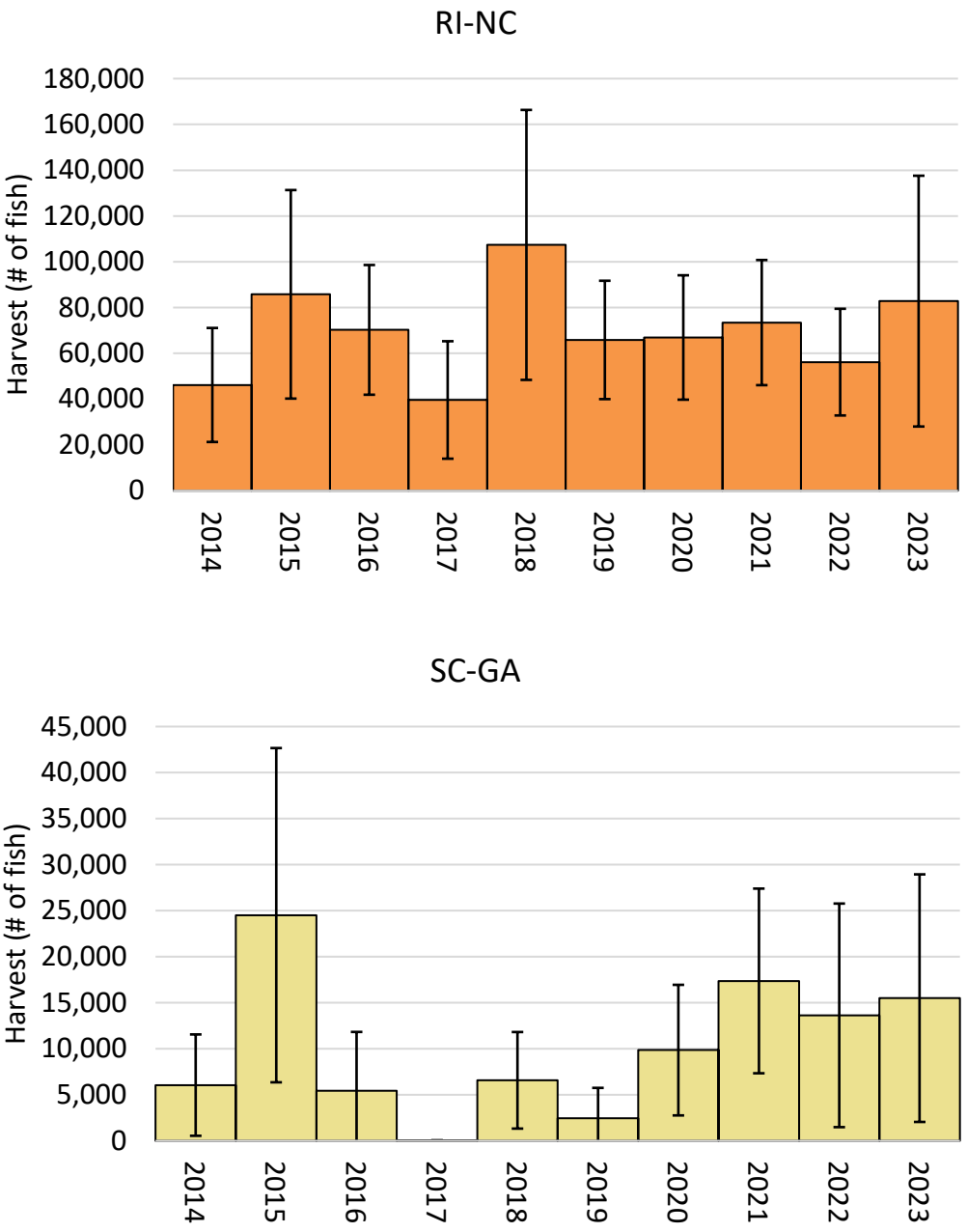


Figure B1. Regional recreational cobia harvest in number of fish from 2014-2023 for RI-NC and SC-GA, corresponding with Options C1-C2 for regional allocation in Section 3.1. Error bars indicate 95% confidence intervals. Source: Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division (MRIP May 2024).

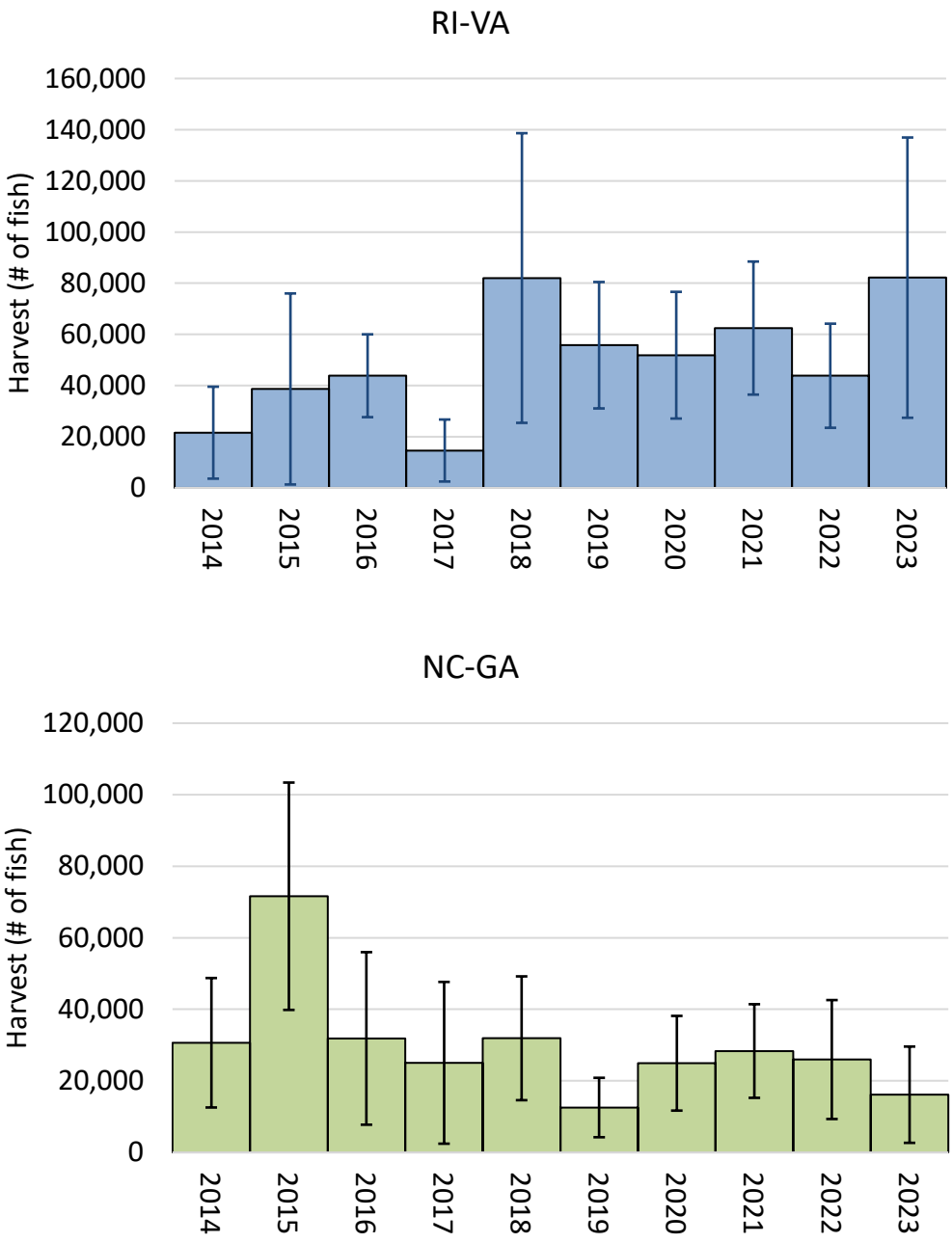


Figure B2. Regional recreational cobia harvest in number of fish from 2014-2023 for RI-VA and NC-GA, corresponding with Options C3-C4 for regional allocation in Section 3.1. Error bars indicate 95% confidence intervals. Source: Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division (MRIP May 2024).

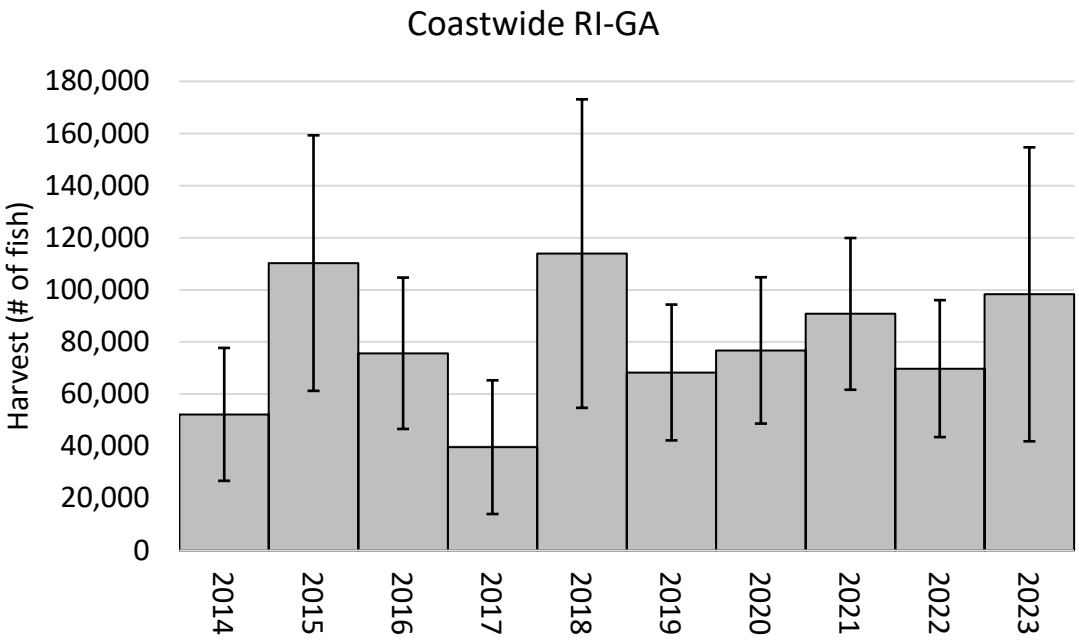


Figure B3. Regional recreational cobia harvest in number of fish from 2014-2023 for the coastwide management unit RI-GA, corresponding with Option D for a coastwide target in Section 3.1. Error bars indicate 95% confidence intervals. Source: Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division (MRIP May 2024).

Atlantic States Marine Fisheries Commission

1050 N. Highland Street • Suite 200A-N • Arlington, VA 22201
703.842.0740 • 703.842.0741 (fax) • www.asmfc.org

MEMORANDUM

TO: **Coastal Pelagics Management Board**

FROM: **Emilie Franke, FMP Coordinator**

DATE: **July 22, 2024**

SUBJECT: **Public Comment Summary for Atlantic Cobia Draft Addendum II**

The following is an overview of all comments received by ASMFC on Draft Addendum II to Amendment 1 to the Interstate Fishery Management Plan for Atlantic Cobia as of July 8, 2024 (closing deadline).

A total of seven written comments were received on Draft Addendum II comprised of six individual comments and one organization's comment. Some comments directly addressed the management options in Draft Addendum II, and others discussed cobia management more generally.

Seven public hearings were held for eight jurisdictions from June 5 through June 25, 2024. Four hearings were conducted in-person: Virginia, North Carolina, South Carolina, and Georgia. Three joint hearings were conducted via webinar covering states from New York through Georgia. 37 members of the public attended the hearings, and two of those attendees attended multiple hearings. Only some attendees provided public comments.

The following pages include tables summarizing how many comments were received in support of each option proposed in Draft Addendum II. The summary tables are followed by all the written comments received and the state-by-state public hearing summaries and attendee lists.

Total Comments Received and Hearing Attendees

Number of written comments received by individuals and organizations, and number of people who attended each public hearing.

Written Public Comments Received	
Individual Comments	6
Organizations	1
TOTAL WRITTEN COMMENTS	**7**
Public Hearing Attendance	
Hearing	**Public Attendees***
New York-New Jersey-Delaware Webinar	1
Maryland-Virginia-North Carolina Webinar	4
Virginia (Fort Monroe)	3
North Carolina (Manteo)	2
South Carolina (Okatie)	13
Georgia (Townsend)	9
South Carolina-Georgia Webinar	7
TOTAL HEARING ATTENDEES	**37**

**Public attendees do not include state staff, ASMFC staff, or Commissioners/Proxies.*

Section 3.1 Recreational Allocation Framework

Number of written and public hearing comments in support of each option.

	Option A. SQ State-by-State	Option B1/B2. State-by-State Recent Data	Option C1/C2. Regional Two-State Southern Region	Option C3/C4. Regional Three-State Southern Region	Option D. Coastwide
Individual	1				
Organization					1
Written Total	**1**	**0**	**0**	**0**	**1**
NY-NJ-DE Web					
MD-VA-NC Web					
Virginia		1			
North Carolina					
South Carolina		1			
Georgia			1		
SC-GA Web					
Hearing Total	**0**	**2**	**1**	**0**	**0**

Note: Five commenters did not select a specific recreational allocation framework option, but noted opposition to increasing Virginia's allocation. One commenter did not select a specific allocation framework, but noted the combined 10-year/6-year average landings would incorporate the most years of data to reduce error (Option B2, C2, or C4).

The comment in support of Option A. status quo state-by-state allocation framework with data from 2006-2015 noted that given the high uncertainty around cobia MRIP data, the low level of harvest in states experiencing an expansion, and with overfishing not occurring, allocation should remain status quo.

Comments in support of a state-by-state allocation framework using updated data (Option B1 2018-2023, or Option B2 2014-2023/2018-2023) noted the need to use the most recent data available. One commenter noted that state-by-state allocation would be easier to implement as compared to coastwide allocation, which would be politically difficult to implement since states would have to coordinate on consistent management measures. Another commenter noted if state-by-state allocation were continued, the northern *de minimis* states do not need 5% of the quota, and should only get 1-2% of the quota.

Regarding South Carolina's proposed allocation, two commenters noted that South Carolina's harvest has been lower in recent years, thus resulting in a lower proposed allocation, due to implementation of South Carolina's May spawning closure. May historically was the time of

peak cobia harvest for South Carolina before the spawning closures. They noted that South Carolina should not be penalized with the lower allocation for taking conservation action to protect spawning cobia.

The commenter in support of Options C1/C2 regional allocation with a two-state southern region (SC-GA) supports regional management given the uncertainty around how the cobia stock will continue to change. Another commenter noted that if regional management is chosen, North Carolina should be grouped with Virginia (i.e., two-state southern region of SC-GA) since Virginia would bring a large amount of quota to the northern region.

One commenter noted they have not decided which allocation framework option to support, but stated that using the combined 10-year/6-year average (Option B2, C2, or C4) would incorporate the most years of data to reduce error.

The comment in support of Option D. coastwide allocation noted that MRIP data uncertainty would be substantially reduced by using data at the coastwide level, and that the coastwide approach captures the dynamic changes in stock distribution. The comment noted this would also eliminate *de minimis* determinations which are complex and of questionable effectiveness.

Five commenters did not select a specific recreational allocation framework option, but noted opposition to increasing Virginia's allocation. There is concern about giving more quota to Virginia where more fish are being harvested and more people are fishing, and the associated negative impacts on the stock. Commenters noted this is not conservation and would not protect the resource. Some commenters questioned why harvest would be restricted in states with a relatively small impact on the stock, like Georgia and South Carolina, when Virginia is having the biggest impact on the stock. There are concerns about equitability and drastically reducing quota in states with important cobia fisheries, like North Carolina where there are not many other species available to target during the time when cobia are available.

Section 3.2 Updates to State/Regional Recreational Allocations

Number of written and public hearing comments in support of each option.

	Option A. SQ Addendum Process	**Option B. Board Action for De Minimis or Data Revisions**
Individual	1	
Organization	1	
Written Total	**2**	**0**
NY-NJ-DE Web		
MD-VA-NC Web		
Virginia		
North Carolina		
South Carolina		
Georgia		
SC-GA Web		
Hearing Total	**0**	**0**

In support of Option A. status quo addendum process to change allocations, one comment notes support for a coastwide allocation framework, which would eliminate specific state/regional allocations and therefore there would not be any state/regional allocations to update. The comment does note concern about how the future revisions of MRIP estimates may impact the cobia coastwide harvest target, and notes that any discussion of allocation should have higher levels of participation and input.

The other comment in support of Option A notes everything should be status quo given the high uncertainty around cobia MRIP data, the low level of harvest in states experiencing an expansion, and with overfishing not occurring.

Section 3.3 Data and Uncertainty in Recreational Landings Evaluations

Number of written and public hearing comments in support of each option.

	Option A. SQ Up to 3-Year Rolling Average	**Option B. Up to 5-Yr Rolling Average**
Individual	1	
Organization	1	
Written Total	**2**	**0**
NY-NJ-DE Web		
MD-VA-NC Web		
Virginia		
North Carolina		2
South Carolina		
Georgia		
SC-GA Web		
Hearing Total	**0**	**2**

In support of Option A. status quo up to a 3-year rolling average used during harvest target evaluations, one comment noted concern about the length of time between evaluations and the potential to miss an emerging trend and take management action too late. Therefore, the comment supports using three years of data to evaluate recreational harvest estimates and smooth out MRIP data.

The other comment in support of Option A notes everything should be status quo given the high uncertainty around cobia MRIP data, the low level of harvest in states experiencing an expansion, and with overfishing not occurring.

In support of Option B. up to a 5-year rolling average used during harvest target evaluations, two comments noted the need to use more years of data to level out the landings, especially if there are some years with low harvest due to bad weather, for example.

One comment noted interest in the confidence interval approach and would have preferred it standalone as an option to solicit public input. The comment noted the confidence interval approach would improve how MRIP data are used.

Section 3.4 Overage Response for Recreational Landings Evaluations with Rolling Averages

Number of written and public hearing comments in support of each option.

	Option A. SQ Individual State Evaluations	**Option B. Performance Comparisons***
Individual	1	
Organization	1	
Written Total	**2**	**0**
NY-NJ-DE Web		
MD-VA-NC Web		
Virginia		
North Carolina		
South Carolina		
Georgia		
SC-GA Web		
Hearing Total	**0**	**0**

** Performance comparisons are if a state/region exceeds its target, a reduction would not be required if another state/region is below their target and if the coastwide target was not exceeded.*

In support of Option A. status quo individual state evaluations, one comment noted that accountability must be maintained (i.e., if a state is over their target, a reduction is needed).

The other comment in support of Option A notes everything should be status quo given the high uncertainty around cobia MRIP data, the low level of harvest in states experiencing an expansion, and with overfishing not occurring.

Section 3.5 Timeline for Setting Commercial and Recreational Measures

Number of written and public hearing comments in support of each option.

	Option A. SQ Up to 3 Years	**Option B. Up to 5 Years**
Individual	1	
Organization	1	
Written Total	**2**	**0**
NY-NJ-DE Web		
MD-VA-NC Web		
Virginia		2
North Carolina		2
South Carolina		
Georgia		
SC-GA Web		
Hearing Total	**0**	**4**

In support of Option A. status quo setting management measures for up to three years, one comment noted five years would be too long of a timeframe. The comment also noted that while five years would align with the stock assessments, there are limited cobia index data available in the assessments to provide new information.

The other comment in support of Option A notes everything should be status quo given the high uncertainty around cobia MRIP data, the low level of harvest in states experiencing an expansion, and with overfishing not occurring.

In support of Option B. setting management measures for up to five years, comments noted the need for consistency and continuity for regulations, the importance of aligning management action with the stock assessment data, and the flexibility of having the ability to set management measures for longer if needed.

Additional Topics Raised in Comments

Commenters raised several additional topics regarding cobia management as follows, in no particular order:

- Management options rely on assumption that there is a significant north/south migration of cobia, but research does not seem to support that theory.
- Concern about the health of the stock, and in favor of any regulations that maintain or tighten the current restrictions.
- Support the use of spawning season closures.
- See more value recreationally as a primarily catch and release fishery.
- Lower the minimum size to allow for harvest of both males and female, and/or implement a slot size.
- Implement tags/stamps for harvest.
- Focus on education and enforcement.
- Disappointment that Draft Addendum II did not consider innovative or alternative tools to address the persistent recreational data issues for Atlantic cobia. New ideas could have explored harvest reporting and/or how emerging fishing application technology to improve cobia management.

From: David Harter
To: Emilie Franke
Cc: Al Stokes
Subject: [External] Emilie
Date: Friday, June 7, 2024 9:41:33 AM

Thank you for your concise and informative presentation at the PRSF Maritime Center last night. As a past participant in many SAFMC meetings, I have heard more than my share of dry, rambling and confusing presentations of scientific data to know a good one and yours was well done.

Confirming what I commented on in the meeting, the coastal and regional management amendments seem to rely on a belief that there is a significant north/south migration of cobia. The results of the last 20 years of traditional dorsal tagging, archival satellite tagging, DNA studies and fisherman observations do not seem to support that theory. We would like to see the results of any recent studies that do support this.
I have been fishing the SC offshore waters for 50 years including the Gulf Stream and we have observed many pelagic migrations over the years, but cobia has not been one of them. Considering how many fish are caught north of us, that would not be an insignificant migration.
Thank you for what can be a thankless service.

David Harter
Hilton Head Reef Foundation

From: Brodie Brant
To: Comments
Subject: [External] Cobia Draft Addendum II
Date: Friday, June 7, 2024 11:23:57 AM

Hello,
My name is Brodie Brant, and I am a lifelong resident and native of Beaufort, SC. I am an avid outdoorsman and enjoy fishing for cobia in the Broad River and surrounding areas. Based on the experience of myself and other anglers I know, the inshore cobia fishery here in SC is still not as healthy as it has been in the past. I am in favor of any regulations that maintain or tighten the current restrictions on the harvest of cobia along the entire east coast.
While I can only speak from experience on the SC coast specifically, the idea of raising harvest targets (and by extension loosening the regulations) in states like NC and VA is concerning to me because of the migratory nature of cobia. I want to see a thriving cobia population all along the east coast and believe that these fish offer so much more value recreationally as a primarily catch and release fishery.
Thank you for your consideration,
Brodie Brant

From: Joshua R.
To: Comments
Subject: [External] Cobia Draft Addendum II
Date: Friday, June 7, 2024 9:14:29 PM

Good Afternoon,
My name is Capt. Josh Rose. I am a life-long, GA resident, born and raised in Savannah. Being an avid outdoorsman there generally isn't a week I'm not on the water. While GA seems to have a weaker fishery, I have enjoyed the benefits of fishing SC's, Broad River. The cobia draft addendum is frankly confusing and complicated. I am a huge advocate for catch and release practices for every species, therefore I am a advocate for tighter regulations and harvest limits. I do not like the idea of loosening regulations in "more populated" states, as cobia are natural migrators, thus affecting weaker states as my own.
I will say I don't know the answer, I'm not so sure I like the state by state, nor by region regulations. As both do effect neighboring states, no matter what. I know currently it is state by state, and I'm not sure how effectly it's working or not. I do like how SC has closed the month of May for harvest, allowing time for successful spawning. I would like to see this be a standard practice for all states, to ensure a future healthy population. However, the state will in the end make up their own minds regardless of what's best for the fishery. I know this because the GA DNR has refused to change current regulations and limits for redfish, even though the fishery is suffering.

Thank you for your time,
Capt. Josh Rose.

From:	Emilie Franke
To:	Comments
Subject:	FW: [External]
Date:	Monday, June 10, 2024 11:11:22 AM

From: J.R. Waits <jrwaits@fishcall.com>
Sent: Tuesday, June 4, 2024 8:48 PM
To: Emilie Franke <EFranke@ASMFC.org>
Subject: [External]

Hi Emily, I am a charter captain fishing off of Charleston. I target cobia May-July every year. I will not be able to come to the meeting in Port Royal but wanted to express my opinion on Cobia regulations. With a minimum of 36" we rarely harvest a male fish. I would say that 90+% of the cobia over 36" fork length in Charleston area are female fish. There are many more smaller males than larger egg-carrying females so why only harvest the ones carrying the eggs?

I believe the minimum size for cobia should be lowered to 32" so both males and females can be harvested. I would not be imposed to an upper limit either. I believe 42-45" would be appropriate there. I also believe one per person or 3 per boat is the best creel limit.

Capt J.R. Waits
Fish Call Charters
843-509-7337

credit card required to reserve date

*Fishing licenses included
*All redfish are released
*No aerosol sunscreen even beforehand. It stains the boat.

Cancellation Policy: no charge for cancelling 7 days or more before charter, 50% of trip cost for cancelling less than 7 days to 24hrs before charter, 100% of trip cost for cancelling 24hrs or less before charter or for no shows.
Other policies here > www.fishcall.com/ratesandpolicies.html

From: Emilie Franke
To: Comments
Subject: FW: [External] Cobia Managment
Date: Monday, June 10, 2024 11:11:26 AM

-----Original Message-----
From: Captain Phil Smith <captainphil@saltydog.com>
Sent: Tuesday, June 4, 2024 5:51 PM
To: Emilie Franke <EFranke@ASMFC.org>
Subject: [External] Cobia Managment

Ms Franke,
I have charter and recreationally fished all over the East and Gulf Coasts for 40 plus years.
I have seen fisheries of all types have cycles of good and bad years and have listened to the fisherman and feds talk about it.
There seems to be a disconnect on the federal and state side.
Let's look at Red Snapper first.
If you go offshore in SC it's about the only thing that bites your hook.
Big 10-20 lb Red Snapper everywhere.
You have a hard time catching Sea Bass, Grouper or Trigger of B liners due to the abundance of Red Snapper.
I can't believe that is good for the ecosystem habitat.
Blue Fin tuna are as abundant as ever in the coastal waters. Another fish that if left unchecked will devastate some other fisheries.
Redfish is SC waters are so numerous in the winter you can catch them with chicken wings, I kid you not.
Cobia is a fish that has had huge swings in numbers over the last 40 years.
People saying they were gone one year and have a banner year the next.
From what I have seen this year and talked to other fisherman they are showing an abundance of small 30-40" fish with fewer large fish.
Cobia grow quickly as you may know.
36" fish is around 2 years old.
Females reach sexual maturity around 3 years.
If you do anything raise the size limit to 40" to allow more brood stock to survive.
With all this you can't do a thing if you only selective enforce.
Few charter boats break the rules.
I know there are some bad actors but if they are caught take their privlage to fish away, recreationaly and charter/commercially.
Most of the people breaking the rules are recreational anglers either intentionally or ignorantly.
Education and enforcement not over regulation will work.
Also states and feds should have game tags/stamps for fish.
If a charter or private person wants to catch a certain fish buy a tag/stamp.
Let's just make sure it goes into the resource to replenish and add habitat like artificial reefs.
Capt Phil Smith
Sent from my iPhone

From:	Lenny Rudow
To:	Comments
Subject:	[External] Cobia Draft Addendum II
Date:	Tuesday, June 25, 2024 4:33:01 PM
Attachments:	Outlook-1488640139.png

Hi - considering the uncertainty in MRIP harvest data regarding cobia, the relatively low level of harvest in states experiencing an expansion, and with overfishing not occurring, please register my public comment as supporting status quo options in all cases.

Thanks!

Lenny Rudow, Editor - p. 410/798-6503
cell 410/353-1981- Lenny@fishtalkmag.com
www.fishtalkmag.com

AMERICAN SALTWATER GUIDES ASSOCIATION
BETTER BUSINESS THROUGH CONSERVATION

July 7th, 2024

Emilie Franke
FMP Coordinator
1050 N. Highland Street
Suite 200 A-N
Arlington, Virginia 22201

RE: ASGA Comments on Draft Addendum II to Amendment 1 to the Interstate Fishery Management Plan for Atlantic Cobia

Dear Ms. Franke and Members of the Cobia Board,

The American Saltwater Guides Association thanks you for consideration of the following comments on Draft Addendum II to the Cobia IFMP. ASGA represents conservation-minded fishing guides, private anglers, and fishing-related businesses who believe in "Better Business thorough Conservation" and support the promotion of resource-first, science-based, and risk-averse management strategies that ensure the long-term sustainability of marine fisheries and fishing-dependent coastal communities.

For our members and the recreational angling community, cobia are an increasingly important species that, when seasonally available, offer high-quality fishing experiences. The thrill and challenge of sight-casting a 50" cobia is a huge draw for this fishery, and is the predominant method used by our membership. While some of the fishing guides we represent are highly specialized in the cobia fishery, some aren't and target cobia when locally available and/or incidentally encounter the species. Anecdotally and according to surveys, cobia are moving northward—cobia landings and catches are shifting northwards too—likely a climate change impact. Anglers in New Jersey and New York can now reliably target cobia, and that opportunity may continue to expand to other states like Connecticut and Rhode Island. However, infrequent stock assessments, limited applied academic research, and inherent challenges in collecting recreational data leave us with huge gaps in our collective understanding of Atlantic cobia and hinders our ability to effectively and sustainably manage this stock.

The primary objective of Draft Addendum II is to consider new recreational harvest allocation strategies and address data uncertainty concerns. ASGA commends the ASMFC Coastal Pelagics Management Board for taking up this management action and earnestly working toward addressing the numerous management challenges with this fishery. For species like Atlantic cobia that are overwhelmingly recreational—96% of harvest allocated to the recreational sector—managers and scientists must grapple with immense uncertainty. The reality of discovering potentially 30-40% overestimation biases in the Federal Effort Survey portion of the Marine Recreational Informational Program further exasperates this challenge.

ASGA's primary interest in providing input on Draft Addendum II is for ensuring the long-term sustainability of Atlantic cobia; however, the strategies in this document to address recreational data problems and managing a highly dynamic species exhibiting climate change impacts affords

potential lessons learned for applications in other fisheries and regions. In general, ASGA supports alternatives in this document that seek regulatory consistency, effectively capture Atlantic cobia's current distribution, and leverage methods to improve the PSEs of fishery data for management while not sacrificing accountability or sustainability.

As noted above, NOAA Fisheries is currently undergoing a pilot study to confirm potential overestimation biases in MRIP and is concurrently engaged in a re-envisioning process for the recreational data collection enterprise nationwide. While some may have preferred to table Draft Addendum II until new recreational catch and effort estimates are available, ASGA is supportive of progressing forward and reevaluating in the future should new estimates become available. However, ASGA was somewhat disappointed that this document fails to consider innovative or alternative tools to address the persistent recreational data issues that are perverse within Atlantic cobia. As an example, it would have been interesting to gather public input on ideas such as harvest reporting and/or how emerging fishing application technology could improve cobia management. While Virginia's mandatory reporting program was unfortunately abandoned, ASGA remains interested in the idea of leveraging angler catch reporting—voluntary or mandatory—on a coastwide bases to address the data uncertainties with cobia (pulse, rare-event, predominantly recreational by boat). In addition to gauging the public's interest on those ideas, gathering technical input on the potential utility of such data streams would have been a productive exercise.

ASGA's Preferred Alternatives for Draft Addendum II:

- Section 3.1 Recreational Allocation Framework: **Option D-Coastwide**
  - The number one issue in cobia management is recreational data—MRIP is notoriously ineffective at capturing pulse, rare-event species targeted by boat, and managing off state-by-state estimates only worsen data quality in this fishery; managing cobia on a coastwide basis would substantially reduce the data uncertainties and make far better use of the available data. Additionally, ASGA supports the coastwide approach, as we believe it best captures the dynamic nature and observed distribution shifts of this fishery.
  - The Coastwide framework also negates the complexity and questionable effectiveness of *de minimis* determinations.
- Section 3.2 Updates to State/Regional Allocations: **N/A**
  - While the selection of the Coastwide Allocation alternative appears to make this option-set unnecessary, ASGA is concerned about how new MRIP estimates may impact cobia management and the Coastwide Harvest Target. In general, ASGA supports affording ASMFC management boards with the authority to quickly respond to new information to sustainably manage fisheries, but the subject of allocation should warrant enhanced participation and input. That being said, the controversial nature of allocation actions may be similarly smoothed by reliance on a coastwide allocation/harvest target.
- Section 3.3 Data and Uncertainty with Recreational Landings Evaluations: **Option A- 3 year**
  - We understand the intention and effect of moving to a five-year harvest evaluation—it would smooth out potential MRIP variance/outliers and produce a more *realistic* harvest estimate. However, we are concerned that that length of time in-between formal evaluations may miss a new emerging trend in the fishery and trigger a management

reaction too late. Three years remains an effective timeframe to evaluate recreational harvest estimates, react if necessary, and smooth out MRIP data. Additionally, we are interested and see the merit in the confidence interval approach but would have preferred this be its own standalone option set to solicit public input. As an example, what are the Technical Committee's thoughts on this, is 95% the optimal CI? Regardless, moving from point estimates to a CI would be an improvement in how we utilize the available recreational data to sustainably manage this unique fishery.

- Section 3.4 Overage Response for Recreational Landings Evaluations: **Option A, Status Quo**
  - Even with the improvements to data quality and how that data is used, accountability must be maintained.
- Section 3.5 Timeline for Setting Commercial and Recreational Measures: **Option A, Status Quo**
  - Like other alternatives, we understand the rationale for extending specification periods/measures to avoid "management whiplash." However, we fear five-year specifications may be too long of a timeframe. One of the other stated benefits of the five-year is its alignment with the stock assessment—that benefit may be overstated in this fishery. It is our understanding that the cobia assessment has very limited indices for the species outside of MRIP data. Therefore, we believe maintaining the three-year specifications period, while still considering assessment information when it becomes available, is the best course of action.

ASGA appreciates the CMP Board's work to address the challenges within the Atlantic cobia fishery, and we look forward to working with the ASMFC to tackle these and other challenges facing the recreational fishing community. Please reach if you have any questions or if we can be helpful in any other way.

Sincerely,

Tony Friedrich
Vice President and Policy Director
American Saltwater Guides Association
tony@saltwaterguidesassociation.org
(202) 744-5013

Will Poston
Policy Associate
American Saltwater Guides Association
will@saltwaterguidesassociation.org
(202) 577-8990

Cobia Draft Addendum II Public Hearings
Georgia
June 5, 2024 – Townsend, GA
9 public attendees
(see enclosed sign-in sheet)

Hearing Officer: Doug Haymans (GADNR)

Additional Georgia Commissioners in Attendance: Spud Woodward

Staff: Emilie Franke (ASMFC), several GADNR staff

Public Comments

- Tim Tarver: With the uncertainty of where the population if headed, it would be better to move to regional management grouping South Carolina and Georgia together in a region (Section 3.1 Option C1/C2).

- One commenter noted they have not decided which option to support, but do note that using the combined 10-year/6-year average would incorporate the most years of data to reduce error.

- General comments noted the high harvest in Virginia. One commenter specifically noted the small impact of South Carolina and Georgia on the stock, and questioned why management in SC/GA should change when the impact is coming from Virginia.

Cobia Draft Addendum II for Public Comment

Atlantic States Marine Fisheries Commission
June 5, 2024
Townsend, GA

-- PLEASE PRINT CLEARLY –

Name	City, State	Organization (if applicable)
Karon Price	Statesboro, Ga	
Barney Allen	Statesboro Ga	
Christopher Ruff	Townsend, GA	
William Emil Stokes	Townsend, GA	
FORREST FORDHAM	TOWNSEND, GA	
Andy Bowen	Townsend, GA	
Phillip Waters	Townsend GA	
Amanda Waters	Townsend GA	
Tim Tanner	Glennville, GA	

Cobia Draft Addendum II Public Hearings
South Carolina
June 6, 2024 – Okatie, SC
13 public attendees
(see enclosed sign-in sheet)

Hearing Officer: Ben Dyar (SCDNR)

Additional South Carolina Commissioners in Attendance: Blaik Keppler (SCDNR)

Staff: Emilie Franke (ASMFC), several SCDNR staff

Public Comments

- David Harter: These management options depend on the assumption that cobia migrate north-south, and our research has not shown this north-south migration. One of the difficulties of regional or state-wide allocations is it gives fishermen false hope that if the stock is depleted, that stock would be replenished by migrating fish.

- Tony Constant: South Carolina has had high harvest years in the past. The allocation options are set up so the more you harvest, the more you get. South Carolina has a spawning closure in May, which used to be the peak harvest time. Much of South Carolina's harvest has decreased due to this spawning closure, and South Carolina should not be penalized for being conservationist. Support maintaining state-by-state allocation using the new data (Section 3.1 Option B1/B2).

- Tuck Scott: Concern that states harvesting fewer fish get less allocation, and states that are killing more fish get more allocation. Increasing the allocation where more people are killing more fish is not conservation. South Carolina has implemented a spawning closure which lowers our harvest numbers, which then lowers the allocation. Giving more fish to states with higher harvest is the opposite of conservation.

Cobia Draft Addendum II for Public Comment

Atlantic States Marine Fisheries Commission
June 6, 2024
Okatie, SC

-- PLEASE PRINT CLEARLY –

Name	City, State	Organization (if applicable)
Frank Gibson	BFT SC	BSFD Club
Earl Swierkowski	Beaufort S.C	BSFD Club
Ezekiel Brant	Varnville, SC	
Tony Constant	St Helena Is, SC	
Marie Brittman	Beaufort SC	CCA
David Harter	HHI SC	HHRF
Al Stokes	Bluffton SC	DNR retired
Robert McAliley	Beaufort SC	
Tuck Scott	"	
Shannon O'Quinn	RIDGELAND SC	
Jon Gore	Beaufort, SC	
Tony Wetcal	Beaufort, SC	

Cobia Draft Addendum II Public Hearings
North Carolina
June 11, 2024 – Manteo, NC
2 public attendees
(see enclosed sign-in sheet)

Hearing Officer: Chris Batsavage (NCDEQ)

Staff: Emilie Franke (ASMFC), two NC Marine Patrol officers

Public Comments
Due to the small size of the hearing, comments were provided by the two public attendees in a discussion format with points summarized below.

- Concern about equitability and the drastic quota cuts proposed for North Carolina, which has been the center of the cobia fishery.
- North Carolina has had some low years due to bad weather, but this year was higher year with higher numbers and different size fish.
- Don't support reducing North Carolina's quota to give fish to Virginia because at the end of the day, you are trying to protect the resource. Virginia has more people fishing, and giving them more quota will hammer the fish, and this is not the right way to do it.
- North Carolina has historically had a cobia fishery for many generations, and is the main species during the month of May. In Virginia, there are more species to target when cobia are around in June, but in North Carolina there are not many other species to target in May.
- North Carolina has a lower mortality rate because of lower water temperatures.
- People travel from out of state to North Carolina to catch cobia, and there is concern about restricting regulations.
- If regional management is chosen, consider grouping North Carlina with Virginia because they have a large amount of the quota.
- Support setting management measures for up to five years and using a five-year average for evaluations (Section 3.5 Option B; Section 3.3 Option B). Continuity and consistency is important for regulations. The five year timeline also better aligns with the data, and allows more time for the data to level out, especially if there are some years with bad weather for example.
- Northern states do not need 5% of the quota. Consider giving them less quota (1-2%).

9

Cobia Draft Addendum II for Public Comment

Atlantic States Marine Fisheries Commission
June 11, 2024
Manteo, NC

-- PLEASE PRINT CLEARLY –

Name	City, State	Organization (if applicable)
AARON Kelly	Kill Dev. Hills	Rocksolid Fishing
Troy Boyd	KDH	Fowl Hooked

Cobia Draft Addendum II Public Hearings
Virginia
June 12, 2024 – Fort Monroe, VA
3 public attendees
(see enclosed sign-in sheet)

Hearing Officer: Shanna Madsen (VMRC)

Staff: Emilie Franke (ASMFC), Chelsea Tuohy (ASMFC), Pat Geer (VMRC), Somers Smott (VMRC), Josh McGilly (VMRC)

Public Comments

- Thomas Delbridge: Coastwide management seems to make the most sense, but might be politically the most difficult to implement and manage since states would have to agree on the vessel limits. Keeping the state-by-state allocation framework in place would be easier to implement, but the status quo Option A would not work in Virginia, so need to use the more recent data (Section 3.1 Option B1 or B2). Support revisiting that allocation every few years as the population is moving. Doing things that match the periodicity of the stock assessments makes sense (Section 3.5 Option B).

- Alex Perez: Due to the possibility of *de minimis* status changing for states, would support re-evaluating the allocations regularly. Initially supported setting measures for three years due to how fast things are changing and to be proactive. After discussion, supports having the flexibility to set measures for up to five years (Section 3.5 Option B).

Cobia Draft Addendum II for Public Comment

Atlantic States Marine Fisheries Commission
June 12, 2024
Fort Monroe, VA

-- PLEASE PRINT CLEARLY –

Name	City, State	Organization (if applicable)
ALEX PEREZ	NORFOLK, VA	
SUSANNA MUSICK	Glen. Pt	VIMS / VGIFTP
THOMAS DELBRIDGE	YORKTOWN, VA	

Cobia Draft Addendum II Public Hearings
South Carolina-Georgia
June 20, 2024 – Webinar
7 public attendees
(see enclosed attendance)

Hearing Officers: Ben Dyar (SCDNR), Doug Haymans (GADNR)

Other SC-GA Commissioners in Attendance: Blaik Keppler (SCDNR)

Staff: Emilie Franke (ASMFC), Chelsea Tuohy (ASMFC), several SCDNR and GADNR staff

Public Comments

- No public comments were provided.

South Carolina-Georgia Virtual Public Hearing on Cobia Draft Addendum II

June 20, 2024

Webinar Attendees

Last Name	First Name	State
Batsavage	Chris	North Carolina
Bell	Mel	South Carolina
Binz	Julie	South Carolina
Broach	Jason	South Carolina
Darden	Tanya	South Carolina
Deem	Jeff	Virginia
Dyar	Ben	South Carolina
Franco	Dawn	Georgia
Gooding	Elizabeth	South Carolina
Haymans	Doug	Georgia
Haynes	Captain Jess	South Carolina
Keppler	Blaik	South Carolina
McDonough	Chris	South Carolina
Perkinson	Matt	South Carolina
Poston	Will	Maryland
Schlick	CJ	South Carolina
Scott	Tuck	South Carolina
Shultz	Glenn	Maryland
Swann	Nurse Jane	Maryland

ASMFC Staff: Emilie Franke, Chelsea Tuohy, Kurt Blanchard

Cobia Draft Addendum II Public Hearings
Maryland-Virginia-North Carolina
June 24, 2024 – Webinar
4 public attendees
(see enclosed attendance)

Hearing Officers: Lynn Fegley (MDDNR), Shanna Madsen (VMRC), Chris Batsavage (NCDEQ)

Other MD-VA-NC Commissioners in Attendance: David Sikorski (MD)

Staff: Emilie Franke (ASMFC), Chelsea Tuohy (ASMFC), several MDDNR and VMRC staff

Public Comments

- No public comments were provided.

Maryland-Virginia-North Carolina Virtual Public Hearing on Cobia Draft Addendum II

June 24, 2024

Webinar Attendees

Last Name	First Name	State
Batsavage	Chris	North Carolina
Cimino	Joseph	New Jersey
Cuthrell	Billy	North Carolina
Fegley	Lynn	Maryland
Gillingham	Lewis	Virginia
Giuliano	Angela	Maryland
Madsen	Shanna	Virginia
McGilly	Joshua	Virginia
Newman	Thomas	North Carolina
Poston	Will	Maryland
Sikorski	David	Maryland
Smott	Somers	Virginia
Spike	Ali	Maryland

ASMFC Staff: Emilie Franke, Chelsea Tuohy

Cobia Draft Addendum II Public Hearings
New York-New Jersey-Delaware
June 25, 2024 – Webinar
1 public attendee
(see enclosed attendance)

Hearing Officers: John Maniscalco (NYDEC), Joe Cimino (NJDEP), John Clark (DNREC)

Other NY-NJ-DE Commissioners in Attendance: Marty Gary (NY)

Staff: Emilie Franke (ASMFC), Tracey Bauer (ASMFC), several NYDEC staff

Public Comments

- No public comments were provided.

New York-New Jersey-Delaware Virtual Public Hearing on Cobia Draft Addendum II

June 25, 2024

Webinar Attendees

Last Name	First Name	State
Batsavage	Chris	North Carolina
Cimino	Joseph	New Jersey
Clark	John	Delaware
Gary	Marty	New York
Hornstein	Jesse	New York
Maniscalco	John	New York
McMenamin	Kevin	Maryland
Morgan	Renee	New York
Schuller	Zachary	New York

ASMFC Staff: Emilie Franke, Tracey Bauer

Atlantic States Marine Fisheries Commission

Shad and River Herring Management Board

August 7, 2024
4:15 p.m. – 5:30 p.m.

Draft Agenda

The times listed are approximate; the order in which these items will be taken is subject to change; other items may be added as necessary.

1. Welcome/Call to Order (*L. Fegley*) 4:15 p.m.

2. Board Consent 4:15 p.m.
   - Approval of Agenda
   - Approval of Proceedings from October 2023

3. Public Comment 4:20 p.m.

4. Consider 2024 River Herring Benchmark Stock Assessment **Action** 4:30 p.m.
   - Presentation of Stock Assessment Report *(K. Drew; M. Conroy)*
   - Presentation of Peer Review Panel Report *(A. Jordaan)*
   - Consider acceptance of benchmark stock assessment and peer review report for management use
   - Consider management response, if necessary

5. Other Business/Adjourn 5:30 p.m.

The meeting will be held at The Westin Crystal City (1800 Richmond Highway, Arlington, VA; 703.486.1111) and via webinar; click here for details

MEETING OVERVIEW

Shad and River Herring Management Board Meeting
August 7, 2024
4:15 p.m. – 5:30 p.m.

Chair: Lynn Fegley (MD) Assumed Chairmanship: 2/23	Technical Committee Chair: Wes Eakin (NY)	Law Enforcement Committee Representative: Lt. Col. Jeffrey Sabo
Vice Chair: Phil Edwards (RI)	Advisory Panel Chair: Pam Lyons Gromen	Previous Board Meeting: October 16, 2023
Voting Members: ME, NH, MA, RI, CT, NY, NJ, PA, DE, MD, DC, PRFC, VA, NC, SC, GA, FL, NMFS, USFWS (19 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from October 2023

3. Public Comment – At the beginning of the meeting public comment will be taken on items not on the agenda. Individuals that wish to speak at this time must sign-in at the beginning of the meeting. For agenda items that have already gone out for public hearing and/or have had a public comment period that has closed, the Board Chair may determine that additional public comment will not provide additional information. In this circumstance the Chair will not allow additional public comment on an issue. For agenda items that the public has not had a chance to provide input, the Board Chair may allow limited opportunity for comment. The Board Chair has the discretion to limit the number of speakers and/or the length of each comment.

4. Consider 2024 River Herring Benchmark Stock Assessment (4:30-5:30 p.m.) Action

Background

- The River Herring Benchmark Stock Assessment was initiated in April 2022. After delays in the proposed timeline, the scheduled completion date was moved to August 2024.
- The final Assessment Workshop was held August 21-25, 2023.
- The assessment evaluated the condition of Atlantic coast river herring stocks and habitat availability on a system-specific, regional, and coastwide metapopulation basis (**Briefing Materials)**.
- The assessment was peer-reviewed by a panel of independent experts June 4-7, 2024. The Peer Review Report provides the panel's evaluation of the assessment findings (**Briefing Materials**).

Presentations

- Overview of Benchmark Stock Assessment by K. Drew and Margaret Conroy
- Presentation of Peer Review Report by A. Jordaan

Board actions for consideration at this meeting

- Consider the stock assessment for management use
- Consider management response to the assessment and peer review

5. Other Business/Adjourn

Shad and River Herring 2024 TC Tasks

Activity level: Medium

Committee Overlap Score: Medium (Multi-species committees for this Board)

Committee Task List
• Updates to state Shad SFMPs • Annual state compliance reports due July 1
TC Members: Wes Eakin (Chair, NY), Matthew Jargowsky (Vice-Chair, MD), Mike Brown (ME), Conor O'Donnell (NH), Brad Chase (MA), Patrick McGee (RI), Kevin Job (CT), Brian Neilan (NJ), Brian Niewinski (PA), Johnny Moore (DE), Ingrid Braun-Ricks (PRFC), Joseph Swann (DC), Patrick McGrath (VA), Holly White (NC), Jeremy McCargo (NC), Jim Page (GA), Reid Hyle (FL), Ken Sprankle (MA), Ruth Hass-Castro (NOAA), John Ellis (USFWS). Ted Castro-Santos (USGS), C. Michael Bailey (USFWS), Kyle Hoffman (SC), James Boyle (ASMFC), Katie Drew (ASMFC)

DRAFT PROCEEDINGS OF THE

ATLANTIC STATES MARINE FISHERIES COMMISSION

SHAD AND RIVER HERRING MANAGEMENT BOARD

Beaufort Hotel
Beaufort, North Carolina
Hybrid Meeting

October 16, 2023

These minutes are draft and subject to approval by the Shad and River Herring Management Board.
The Board will review the minutes during its next meeting.

TABLE OF CONTENTS

INDEX OF MOTIONS

ATTENDANCE

Board Members

Pat Keliher, ME (AA)
Steve Strain, ME (GA)
Rep. Allison Hepler, ME (LA)
Renee Zobel, NH, proxy for C. Patterson (AA)
Doug Grout, NH (GA)
Dennis Abbott, NH, proxy for Sen. Watters (LA)
Melanie Griffin, MA, proxy for D. McKiernan (AA)
Raymond Kane, MA (GA)
Sarah Ferrara, MA, proxy for Rep. Peake (LA)
Conor McManus, RI, proxy for J. McNamee (AA)
David Borden, RI (GA)
Eric Reid, RI, proxy for Sen. Sosnowski (LA)
Justin Davis, CT (AA)
Bill Hyatt, CT (GA)
Craig Miner, CT, proxy for Rep. Gresko (LA)
Marty Gary, NY (AA)
Emerson Hasbrouck, NY (GA)
Joe Cimino, NJ (AA)
Jeff Kaelin, NJ (GA)
Allison Murphy, NOAA

(AA = Administrative Appointee; GA = Governor Appointee; LA = Legislative Appointee)

Ex-Officio Members

Delayne Brown, Law Enforcement Committee Rep.

Staff

Bob Beal
Toni Kerns
Tina Berger
Madeline Musante
Katie Drew
James Boyle
Caitlin Starks
Chelsea Tuohy
Tracey Bauer
Jeff Kipp
Jainita Patel
Kristen Anstead

Guests

Pat Augustine
Jason Avila
Alan Bianchi, NC DMF
Emily Bodell, NEFMC
Jason Boucher, NOAA
Colleen Bouffard, CT DEEP
Allen Burgenson, Lonza
Benson Chiles
Margaret Conroy, DE DNREC
Jamie Cournane, NEFMC
Caitlin Craig, NYS DEC
Renee St. Amand, CT DEEP
Kevin Sullivan, NH FGD
John Sweka, US FWS
Julie Evans
Emily Farr, Manomet
Maria Fenton
Tony Friedrich, ASGA
Marty Gary, NY (AA)
Pat Geer, VMRC
Allie Hayser, Manomet
Derrek Hughes, NYS DEC
Jon Hurdle, NJ Spotlight
Chip Lynch, NOAA
John Maniscalco, NYS DEC
Mike Thalhauser, Maine Center for Coastal Fisheries
Verewe Wang, ECU
Craig Weedon, MD DNR
Steve Meyers
Allison Murphy, NOAA
Josh Newhard, US FWS
Conor ODonnell, NH FGD
Jeffrey Pierce, Alewife Harvesters of Maine
Michael Pierdinock
Paul Risi
Jeffrey Sabo, PA FBC
Christopher Scott, NYS DEC
Melissa Smith, MA DMR
Chris Wright, NOAA
Darrell Young, Alewife Harvesters of Maine
Renee Zobel, NH FGD

The Shad and River Herring Management Board of the Atlantic States Marine Fisheries Commission convened in the Rachel Carson Ballroom via hybrid meeting, in-person and webinar; Monday, October 16, 2023, and was called to order at 4:50 p.m. by Chair Lynn Fegley.

CALL TO ORDER

CHAIR LYNN FEGLEY: It looks like we are in order. My name is Lynn Fegley; I'm the Administrative Commissioner for the state of Maryland, happy to serve as your Chair. I have had enough Swedish fish at this point to talk very fast. I think we're going to roll right through this. The first order, well, first let me just remind everybody that we have James Boyle here to my right, Dr. Katie Drew to my left, to help with today's presentations.

We have just one action item, which is FMP Review, so I'll be looking for a motion for that towards the end of the meeting.

APPROVAL OF AGENDA

CHAIR FEGLEY: The first order of business is Board consent on the agenda. Does anybody have any suggested changes or modifications to the agenda? Okay, seeing none; we'll consider that approved by consent.

APPROVAL OF PROCEEDINGS

CHAIR FEGLEY: You have the proceedings from the May, 2023 meeting in your materials. Are there any edits, modifications, changes? Okay, seeing none; I'll consider that approved by consent. Next on the agenda is Public Comment. I know we have in our materials one letter from a Jeffrey Pierce. I would encourage everybody to read that.

PUBLIC COMMENT

CHAIR FEGLEY: Is there any other public comment in the room? Okay, is there anybody online who would like to make public comment? All right, and again, I would just encourage everybody to read the letter from the Alewife Harvesters of Maine, there is some really interesting information in there.

PROGRESS UPDATE ON RIVER HERRING BENCHMARK STOCK ASSESSMENT

CHAIR FEGLEY: Moving on from that, we're going to move right over to, Katie Drew is going to give us a progress update on the river herring benchmark.

DR. KATIE DREW: If you recall from our August meeting, we were at the August Board meeting about to go into our August assessment workshop for the river herring assessment. After the conclusion of that workshop at the end of August, the SAS felt that we needed additional time to complete this assessment, that our original schedule was to have the assessment peer reviewed at the end of this year, and then presented to the Board in February.

But based on we were at the end of August, we felt that was not a reasonable timeline to produce the best product. We are pushing the assessment deadline back one meeting cycle, so that now the assessment will be peer reviewed in February or March, so that it can be presented to the Board at the May meeting, instead of at the February meeting of next year. That's the major progress update for that. We continue to work forward on that, and that seems like I think right now we're going to make that deadline, but I'm happy to answer any questions about that schedule change, or anything else about the assessment if you still have questions.

CHAIR FEGLEY: Are there any questions for Dr. Drew on the assessment timeline shift? Okay, nice work. With that, we're going to move on.

CONSIDER FISHERY MANAGEMENT PLAN REVIEW AND STATE COMPLIANCE FOR THE 2022 FISHING YEAR

CHAIR FEGLEY: James is going to give us the FMP Review and State Compliance, and again, I'll be looking for a motion at the end of this.

MR. JAMES BOYLE IV: I'm going to try to go through this relatively quickly, I know the time crunch. Here is an outline for the presentation. I'm going to start with a short reminder of historical landings over time, and then cover the 2022 fishing year specifically. I'll move on to some of the monitoring efforts in the Compliance Reports, including fish passage, stocking efforts and sturgeon bycatch interactions.

Finally, I'll end with the de minimis requests and recommendations from the Plan Review Team. First a very quick reminder of the historical context. This figure shows the trajectories of commercial landings for river herring and American shad since 1950. Starting in the 1970s, river herring landings fell drastically, and then steadily decreased over time.

For shad there has also been a steady decrease in landings over time, which is of course due in part to the moratorium implemented through Amendments 2 and 3. For this next slide we're just going to zoom in since the 1990s for a better view. If you look at the landings since 1990, there is more variations from river herring, and for shad you can see a general downward trend in landings since the '90s.

I will note that the river herring number needs to be updated, which I'll get into a little bit shortly. Moving on to 2022. Again, the river herring number needs to be corrected, but this table shows state landings and coastwide totals for shad and river herring, excluding confidential data. The river herring coastwide commercial landings, including bycatch, totaled about 2.8 million pounds, so we'll correct that.

The Maine number is about 2.6 million pounds that should be in that table, so that updates the numbers accordingly. The nonconfidential bycatch data values increased by 761 percent from 2021 to 3,865 pounds, although bearing in mind as we talked about the last FMP review, that only 451 pounds were reported last year.

Additionally, Massachusetts reported 27,558 pounds of combined shad and river herring bycatch data from NEFOP. For American shad, the total 2022 commercial landings, directed and bycatch included, reported in compliance reports was 110,027 pounds, which is a 44 percent decrease from landings of 2021.

Bycatch landings of shad also decreased 75 percent, and represent 8 percent of total landings. Reported hickory shad commercial landings were 98,962 pounds, which is a 0.5 percent decrease from 2021. Although bycatch landings increased by 40 percent, but they still represent only 3 percent of total landings. As part of the requirements in Amendments 2 and 3 for river herring and shad, respectively, passage counts are required on select rivers in Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, Pennsylvania, Maryland and South Carolina, 4.55 million river herring were counted, which represents a 2.4 percent increase compared to 2021, and 483,587 shad is a 27 percent increase compared to 2021. Though I will note that this is still excluding Pennsylvania's passage numbers, as I'll get into shortly.

In 2022, 14.64 million hatchery reared American shad fry were stocked in the Pawcatuck, Nanticoke stock tank, for Casco, Potomac, Edisto, and the Santee Rivers, which is a 10 percent decrease from 2021. Maine also continues to participate in trap and transfer stocking of adult pre-spawning alewife of wild origin on the Androscoggin River, although it's not included in the table in the document.

For sturgeon interactions in 2022, there were 49 reported interactions with three fatalities. However, New Jersey gillnetters report the weight of the sturgeon rather than the number of individuals, so they reported 653 pounds. Of those 49 interactions, 36 were identified as Atlantic sturgeon, and 13 as short nosed.

Rhode Island also reports NOAA NEFOP data and at-sea monitoring data, which is available after the compliance report deadline, so their data lagged by one year. In this compliance report for the 2022 fishing year, they reported 23 actions in 2021, and

we will see the 2022 interactions in next year's compliance report in July.

For the upcoming fishing year, Maine, New Hampshire, Massachusetts and Florida have requested de minimis status to their American shad fisheries, and New Hampshire, Georgia and Florida request de minimis status for river herring. They all continue to meet the requirements and qualify for de minimis status, based on their commercial landings.

In evaluating the state compliance reports, the PRT noted some inconsistencies with the requirements in Amendments 2 and 3. First, the PRT did not receive a compliance report from Pennsylvania. Also, similarly last year, there are just a few longstanding issues that are related to funding, staffing choices primarily.

If a state either cannot complete a survey or can take samples and not process them, for example, and there were some other small inconsistencies within compliance report template, such as not including a copy of the state's fishing regulations or a link to the regulations, or a sex on hickory shad, which the PRT requests, even if that section is not applicable to that particular state.

With those minor issues, the PRT recommended approval for the compliance report for 2022. Also, in this year's compliance reports, the PRT requested more detailed information on the sources of bycatch data, in response to the last FMP review. The results showed quite a wide variety of sources, included some states reporting that they had no information available. Therefore, the PRT is recommending the Board consider the inconsistency of bycatch reporting sources coastwide, and was impacted on evaluating bycatch annually.

With that information, the action before the Board is to consider approval of the 2022 shad and river herring FMP Review, State Compliance Reports and de minimis status for Maine, New Hampshire, Massachusetts, Georgia and Florida. With that I am happy to take any questions.

CHAIR FEGLEY: Excellent, thank you, James. Any questions on James' presentation? Questions from the Board. Okay, seeing none; does anybody have a motion around this? Anybody? Doug Grout.

MR. DOUGLAS E. GROUT: I **move to approve the shad and river herring Fishery Management Plan Review and State Compliance report for 2022,** and if you'll put up the list of states that requested de minimis, I'll be glad to list those.

CHAIR FEGLEY: I was waiting to see if you were going to be able to remember all that. While they're getting the motion up, is there a second? All right, Spud, Spud Woodward, thank you very much. Okay, we'll wait for the motion to come up.

MR. GROUT: **And de minimis requests for Maine, New Hampshire, Massachusetts, and Florida for shad and New Hampshire, Georgia and Florida for river herring for the 2022 fishing year**.

CHAIR FEGLEY: Okay, I think that looks about right. We have a motion on the Board, is there any discussion about this? Okay, I'm going to read it into the record really quick. **Move to approve the shad and river herring Fishery Management Plan Review and State Compliance Reports and De Minimis requests from Maine, New Hampshire, Massachusetts and Florida for American shad, and New Hampshire, Georgia and Florida for river herring for the 2022 fishing year**.

Motion by Mr. Grout, second by Mr. Woodward. **Is there any objection to this motion? All right, seeing none; this motion is approved by consent, thank you very much.**

ADJOURNMENT

CHAIR FEGLEY: With that we're going to go right on to Other Business. Does anybody have any other business to bring before the Board? Okay, seeing none; unless there is an objection, I would move to

adjourn this meeting. It's been a long day, thank you, everyone.

(Whereupon the meeting adjourned at 5:01 p.m. on October 16, 2023)

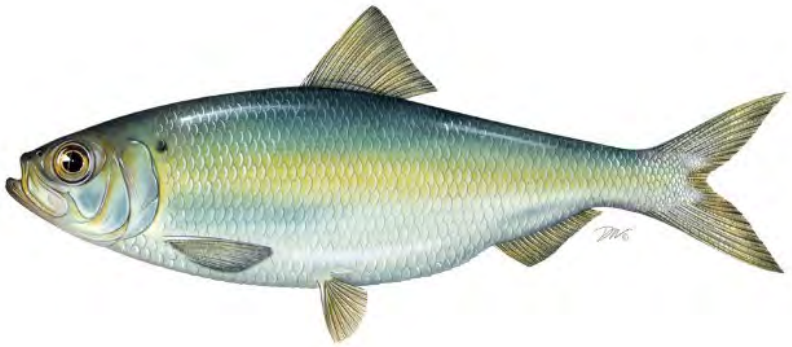
Following is the River Herring Benchmark Stock Assessment Peer Review Report and the Terms of Reference Section from the River Herring Benchmark Stock Assessment Report. Due to very large file sizes, copies of the full Benchmark Stock Assessment and its appendices can be found at:

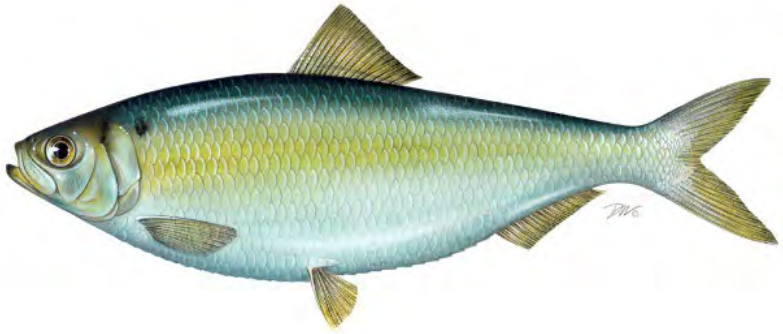
https://asmfc.sharefile.com/public/share/web-sca695e61b99f4f5a95abd08d87890fa2

DRAFT FOR MANAGEMENT BOARD REVIEW

Atlantic States Marine Fisheries Commission

River Herring Benchmark Stock Assessment Peer Review





June 2024

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

DRAFT FOR MANAGEMENT BOARD REVIEW

Atlantic States Marine Fisheries Commission

River Herring Benchmark Stock Assessment Peer Review

Conducted on
June 4-7, 2024
Arlington, Virginia

Prepared by the
ASMFC River Herring Stock Assessment Review Panel

Dr. Adrian Jordaan (Chair), University of Massachusetts-Amherst
Dr. Heather Bowlby, Fisheries and Ocean Canada, Dartmouth, Nova Scotia
Dr. John Wiedenmann, Rutgers University, New Brunswick, New Jersey

DRAFT FOR MANAGEMENT BOARD REVIEW

ACKNOWLEDGEMENTS

The Review Panel gratefully recognized the work conducted by the River Herring Stock Assessment Subcommittee and Technical Committee in preparing the 2024 Benchmark Assessment. The Panel also appreciated the professional, open, and constructive spirit of discussion during the review workshop. The Review Panel thanks the Science staff of the Atlantic States Marine Fisheries Commission for organizing the workshop, and providing review materials in a timely fashion.

EXECUTIVE SUMMARY

River herring stocks remain depleted from a coastwide perspective, with a decade or more of effort in restoration and moratoria not leading to improved status. Trend analysis demonstrated there has been little improvement in populations; most trajectories were flat although high variability resulted in low power to detect trends. No official statement was made regarding current rates of mortality. The assessment employed a stochastic Spawner Per Recruit (SPR) modeling framework to estimate the total mortality (Z) that would reduce the population spawning biomass to 40% of the unfished level (Z40%). Based on this reference point, the terminal year mortality rate had a 50% chance of being above the reference point for 50% of blueback populations and 65% of alewife populations. Mortality rates were high across a number of harvested runs. In addition, a forward projecting statistical catch-at-age model for Monument River (MA) alewife that predicts numbers at age by sex and maturity stage from total in-river catches, escapement counts, and escapement age composition, suggested that at-sea mortality was high. With incidental catch now representing the largest source of fisheries mortality on the population, the high mortality rates create a need to improve the monitoring and modeling of bycatch and improve the efficacy of the current catch caps. The assessment explored data-based catch-cap setting tools and the panel encourages continued effort to improve the monitoring and modeling of bycatch towards improving outcomes.

Data standardization and survey methodology, as well as species identification, and bycatch accounting remain issues and are significant impediments to producing a more data-rich assessment. The panel strongly supports expanded monitoring and effort to better track sources of mortality to region, if not river, specificity.

Overall, the review panel supports the current methodology, analyses, and interpretation of results, and recommends the assessment as the most current and best available science.

TERMS OF REFERENCE

1. Evaluate the choice of stock structure

River herring challenge many of the conventional perspectives on stock structure, since there is weak river-to-river structure based on genetic studies, state-level rule making and regional oversight through the ASMFC, while most management actions are focused at the individual river level. The panel had questions about the use of the genetic data, based on limited years and many systems located close to the same river mouth, especially in southern data. Ultimately, the structure based on genetically-defined stock regions was helpful for organizing the assessment report, but each river functionally is its own stock.

The genetic analysis suffers from a couple of issues with respect to being used to define stock management units. First, the fish collections were composed of 137 collections taken from 99 locations (n=5678). Thus, temporal replicates were available for 28 locations. While temporal stability was present for most rivers capable of being evaluated, there were generally not multi-annual samples for most sites. Still, the panel is satisfied with the level of sampling for the conclusion of genetic regional groupings. Additionally, stocking influence and lack of complete coverage of all river herring populations means that precise geographic partitioning is difficult and confounded by human interventions.

Threats to river herring and restoration of populations are river specific in nature, and as a result the genetic groupings are practical for organizing regional runs, but are not an effective scale for management actions. How to lump rivers will remain a challenge until a more robust approach for regional groupings based on genetics is completed, with expanded sampling and repeated sampling of sites. The panel had discussions around the likelihood of straying within closed bays such as Albemarle Sound, Chesapeake Bay and other particularly southern sites that all grouped together genetically. Straying remains a question in the population structuring or river herring, and has important consequences for the ability of the species to respond with potential range shifts due to climate change (Poulet et al. 2023).

It will also be important to account for the influence of recovery actions on underlying stock structure for river herring, if regional groupings continue to be based on genetic analyses. The SAS was not able to quantify transfers among rivers or regions from historical stocking as detailed information on supplementation programs was not available for the assessment. Although trap and transfer as well as hatchery programs seem to be declining due to smaller run sizes in donor rivers, these types of restoration activities can affect the strength of genetic differentiation among rivers, both by increasing straying rates and through hybridization (Quinn 1993; Koch and Narum 2021). It will be important to have more detailed accounting on donor and recipient rivers to track genetic effects of any future supplementation to ensure regional distinctions and population structure among rivers are maintained.

Thus, we support use of regional groupings based on genetic clusters but believe individual or perhaps adjacent rivers are the primary stock unit. This is consistent with how the status update tables summarize river specific trends in the assessment report.

2. **Evaluate the thoroughness of data collection and the presentation and treatment of fishery-dependent and fishery-independent data in the assessment.**
    a. Presentation of data source variance (e.g., standard errors).
    b. Justification for inclusion or exclusion of available data sources.
    c. Consideration of data strengths and weaknesses (e.g., temporal and spatial scale, gear selectivity, aging accuracy, sample size).
    d. Calculation and/or standardization of abundance indices.
    e. Estimation of bycatch.

General Statements

There were panel questions about the reporting of coefficients of variation (CVs) from the different indices, and whether they could be compared between GLMs and GAM model-based standardization or nominal indices, such as the stratified arithmetic and delta mean. Indices used for trend analysis were chosen using consistent criteria, with each survey needing consistent data collection methods over the time series, or a way to calibrate between gear, vessel, or other changes, 10 consecutive years of data, and 10% of tows/hauls/sampling events were positive for alewife or blueback herring. Overall, the SAS did well to characterize uncertainty from so many different indices with different underlying methodologies and data structures. More clarity on which standardization approach was used for each data series would be helpful. The power analysis was perhaps more informative than the prevalence-based approach. For example, zeros were common in daytime sets of a purse seine and resulted in higher variability for daytime compared to nighttime density estimates (Devine et al. 2018).

Otherwise, there is also a question of the appropriateness of the Z error calculation with both over and underdispersion found in the data. Unfortunately, species identification issues remain a problem in surveys and the various indices, while useful, have low power to detect trends. Thus, it was not surprising that trends were not evident in many datasets. Sample sizes by age were not initially provided and the panel was concerned there were likely small numbers of fish age 5 and greater for estimating Z. Small differences in a low sample size for 6- and 7-year olds would introduce substantial variability. Sample sizes were provided during the peer review workshop and should be made available for future assessments. The detailed information supported concerns about low sample sizes in select systems at the annual scale.

Gear selectivity has not been considered, and may be important particularly in the Northeast Fishery Observer Program (NEFOP) data. Because of the deep body of river herring, they are likely retained at different sizes than Atlantic herring. Understanding selectivity would provide improved understanding of survey indices and observer data from otter trawl and midwater trawl fisheries. The panel had questions about whether ratio-based expansions to the fleet

would be appropriate as bycatch estimators for pelagic schooling fish with strong seasonal patterns in availability (see more detail below).

The panel feels the SAS did as good a job as possible in accumulating all the data on river herring from both fisheries dependent and independent sources. Significant data limitations remain an issue for these stocks, particularly with the lack of standardized methods for ageing and abundance indices. There are essentially only a handful of river herring focused surveys. Species identification in reported landings, and in most historical data sources, as well as current harvested runs in Maine, remains problematic for allocating catch to each of the two species. The lack of genetic assignments of bycatch over time is also an issue with current discards.

Fishery-dependent Data

Commercial Landings

Commercial landings data for years prior to 1950 came from the US Fish Commission reports, and for 1950-2022 came from the Atlantic Coastal Cooperative Statistics Program (ACCSP). States had a variety of reporting strategies associated with river herring commercial fisheries that were initiated in different years. It was not always clear whether all data were from ACCSP, or whether they were maintained independently. The majority of States have enacted moratoria on harvest, except Maine, New York (Hudson River only) and South Carolina.

Recreational fisheries data are collected through surveys, online and intercept, through the Marine Recreational Information Program (MRIP). As a result, river and freshwater recreational catch is unmonitored, including during spawning when use of river herring as bait is most likely. While recreational harvest needs better accounting, it is not likely to be at an equivalent scale relative to marine discards or the limited directed fisheries. Riverine monitoring should be the focus of any future recreational harvest research.

Port-side sampling

Probably the most important aspect of incidental catch is that it has become the highest individual source of fishing mortality on river herring. Thus, understanding total mortality into the future will be contingent on better sampling of the fisheries with incidental bycatch of river herring. A short-term multi-year study from Massachusetts is mentioned here as recognition that, since the primary pelagic fisheries that catch river herring are full retention fisheries, there would be great value in maintaining some level of monitoring that can identify fish to species level. Genetic assignment would be an extremely valuable addition to port sampling to understand the impacts of bycatch on the regional stock groupings.

Incidental catch

Incidental catch is collected as part of the Northeast Fishery Observer Program, although sampling effort is mostly directed to the northeast multispecies groundfish complex. The lack of spatial coverage in the midwater trawl fishery, and pelagic fisheries in general, as well the resulting estimation method for bycatch (see below) were identified by the review panel and in

the public comment period as a source of uncertainty. As the northeast multispecies groundfish fishery has high levels of observer coverage, more uncertainty is found in the midwater trawl pelagic fisheries. It is important to note that bottom trawl catch was a substantial source of incidental catch over the time series, with large catches in some years (Fig. 13-Fig. 14).

The SAS quantified incidental catches (retained and discarded) of alewife and blueback herring from fleets sampled by the Northeast Fishery Observer Program, considering numerous gear types and multiple mesh sizes for trawls and gillnets. There was a recent switch in data systems, with information coming from GARFO with bycatch estimated through SBRM from 1989-2019 and then using CAMS in 2020-2022. The SAS went to considerable effort to standardize the fleet definitions among the two data sources to ensure annual values were comparable. Bycatch from each fleet was estimated using the combined ratio method of Wigley et al. (2007), stratified by region, year, quarter, gear group, and mesh size, while CAMS uses the separate ratio method. In general, the ratio represented the total catch of alewife or blueback herring divided by the kept weight of all species (t/k ratio), where data were imputed from the next closest time period for each gear-region combination if there were no observed catches of river herring in a specific quarter. Total landed weight from dealer slips was used as the raising factor to expand the t/k ratios to total incidental catch, except for mid-water trawl, where the captain's hail estimate from VTR data was used. Compared to landings and recreational catches, bycatch makes up a substantial proportion of total fisheries removals in recent years.

The ratio method has a long history of application in stock assessments, so the SAS did not evaluate the appropriateness of the underlying assumptions for river herring. Specifically, whether alewife or blueback herring catches were proportional and linearly related to total kept catch for each fleet and strata (region, year, quarter, gear group, mesh size). The appendices showing validation plots from various bycatch estimators from Wigley et al. (2006) were provided to the review panel to demonstrate that the assumption of linearity tended to hold. However, the predictive ability of catch ratios for river herring was not assessed.

Since the development of the combined ratio method, there has been substantial progress applying spatial modeling or machine learning tools to observer data to estimate bycatch (Stock et al., 2019, 2020; Yan et al., 2022). Unlike ratio estimators, the more complex methods can account for non-linearity, excess zeros, as well as any underlying correlation structure in catches arising from environmental, ecological, and biological factors. Different bycatch estimators could be compared relative to predictive ability, where the preferred approach would have the lowest root-mean-square-error in cross-validation (e.g., Stock et al. 2020). For river herring, appropriate implementation of the bycatch cap as well as quantifying total fishing mortality critically depend on the precision of bycatch estimates. Therefore, we recommend the ratio estimator be validated with respect to river herring in the shorter term, and further investigation of alternative bycatch estimation approaches in the longer term. Uncertainty in the impacts of bycatch on river herring stocks remains a key issue in the assessment. Given its importance for developing catch caps, the bycatch estimation techniques should receive additional attention and review.

Fishery-independent Data

Run-counts are conducted in numerous states using either electronic fish counters or at fishways. In all but one instance (Monument River, MA), the run-count data do not represent escapement estimates given removals upstream of the enumeration site. Associated biological data collection is required to separate counts to species as well as to monitor length and weight, to take scale or otolith samples for ageing and to characterize maturity and previous spawning history from scales. The review panel appreciated the diversity of sampling programs and urged the SAS to keep working towards better standardization of sampling methods among agencies. In the current assessment, it was challenging to understand precisely how observations were scaled up to daily abundance estimates and how biological sampling was distributed over the run (e.g., proportional to daily counts?). The review panel could not comment on whether sampling was likely to be representative of run characteristics, which influences all subsequent analyses in the assessment. Continued emphasis on biological sampling in association with run counts should be prioritized, and initiating biological data collection on rivers with only counts would be beneficial to future assessment efforts.

Fishery-independent Surveys

The assessment team identified a wide variety of surveys that intercepted one or more life stages of river herring. These included ocean, estuarine, and in-river surveys using trawls, seines, and trapnets. The SAS considered overall interception rates for alewife and blueback herring when including specific surveys in the assessment, discarding ones with extremely low catches of river herring, and/or retaining a subset of the available data (e.g., strata with > 10% positive tows).

Unfortunately, the majority of fishery-independent surveys represented sampling programs that were not specifically designed for river herring. Thus, there are very likely to be undetected issues in the sampling design that do not meet analytical assumptions when calculating abundance indices. For example, the stratification scheme used in the larger oceanic surveys may not result in lower in-stratum vs. among stratum variance (Smith and Gavaris, 1993). In other instances, repeated observations from the same site were treated as independent rather than autocorrelated samples. As with the run count data, whether or not sampling was truly representative and random was not possible to determine from the information presented in the assessment, where the temporal structure of river herring runs (Gibson et al. 2016) makes true random sampling very challenging. The panel considered it likely that undetected autocorrelation, sampling biases, and undetected heterogeneity in river herring observations were prevalent in the data used to calculate abundance indices.

The SAS compared multiple analytical approaches for developing fishery-independent indices from the available data, including design-based and model-based estimators. A key criterion used to select among options was the relative magnitude of the series CV, with approaches resulting in lower CVs considered optimal. However, we consider it inappropriate in this application to base model selection on a comparison of CVs. Design-based approaches rely on a specific sampling scheme to select units of observation from the underlying population. Their

implementation does not require inherent knowledge of the factors causing variability in the population (Cotter and Pilling, 2007). Model-based estimators do not make assumptions about the sampling process generating the data, but inference relies on identifying and incorporating all relevant variables that describe the population response. Models thus seek to balance an explicit trade-off between capturing the maximum amount of variability, while minimizing model complexity (i.e., the bias-variance trade-off; Dumelle et al. 2022).

In fisheries applications such as this one, knowledge and availability of important explanatory variables may be limited, and practical constraints will exert influence over any sampling design. Because the derivation of variance metrics does not encompass statistical prediction uncertainties from model mis-specifications (Hordyk et al., 2019), they are not comparable among different analytical approaches. In other words, we do not know how strongly specific assumptions are violated in the calculation of each fishery-independent index, so it becomes inappropriate to use the relative magnitude of the CV for model selection. Design-based estimators typically have lower variance as compared to model-based, which was confirmed with the SAS and demonstrated by the relative frequency that design-based indices were selected for inclusion in the assessment report.

We recommend that the magnitude of the CV should not be used for selection when both design-based and model-based approaches are compared. Instead, the SAS should attempt to evaluate the characteristics of the data arising from a specific sampling scheme to determine if design-based estimators are appropriate. Alternatively, they should consider the availability of appropriate covariates if pursuing model-based approaches. As it stands, the report inadvertently suggests that specific indices are much less variable than others, even though that impression directly depends on which analytical approach was selected.

Standardizing Techniques

There remain a number of areas in the assessment where methods lack standard protocols across the range that make comparisons difficult. There were two specific issues regarding standardized techniques. The first is species identification. A number of river herring runs still need better species assignment. The panel was concerned over the lack of individual species monitoring. We suggested more biological sampling or the use of scales for ID of species, for proper accounting as part of any sustainable harvest plan, and for State monitoring efforts. Scale collections from runs were not associated with a specific protocol. There was concern across all sites that improper sampling of the run, for example missing the first fish or few samples from mid-run, could result in a bias to smaller and younger individuals. Few details were available for the sample distribution over the spawning run.

The report states “Although used extensively, these protocols have not been validated with known-age river herring. A 2014 aging workshop for river herring found CVs greater than 5% across labs, and systematic bias across readings from paired scales and otoliths.” This admission of issues with diverse ageing processes taken in every state, and the lack of agreement in ages, is of concern to the panel. It was not clear how consistent the agers were, even for each dataset.

3. **Evaluate the methods and models used to estimate population parameters (e.g., Z, biomass, abundance), biological reference points, and bycatch caps/limits, including but not limited to:**
    a. Evaluate the choice and justification of the preferred model(s). Was the most appropriate model (or model averaging approach) chosen given available data and life history of the species?
    b. If multiple models were considered, evaluate the analysts' explanation of differences in results.
    c. Evaluate model parameterization and specification (e.g., choice of CVs, effective sample sizes, likelihood weighting schemes, calculation/specification of M, stock-recruitment relationship, choice of time-varying parameters, plus group treatment).
    d. Evaluate the diagnostic analyses performed, including but not limited to:
        - Sensitivity analyses to determine model stability and potential consequences of major model assumptions.
    e. Evaluate the methods used to characterize uncertainty in estimated parameters. Ensure the implications of uncertainty in technical conclusions are clearly stated.

The SAS conducted a range of analyses to evaluate population trends and statuses. Estimation of total mortality (Z) reference points from SPR analysis (see also TOR 5) by stock region required estimates of length-, weight-, maturity-, natural mortality-, and selectivity-at-age. The SAS also conducted trend analysis on a variety of estimates, including survey CPUE and run sizes, mean length, and mean length-at-age at the river level. Trends were evaluated using two methods: the non-parametric Mann-Kendall test for monotonic trends, and auto-regressive, integrated moving average (ARIMA) models. Mann-Kendall tests were applied for the whole time series, and since 2009 or later if the time series started after 2009. ARIMA models were also applied to the catch per unit effort (CPUE) and run size estimates using the entire time series. Previously-developed statistical catch at age assessment models were updated for three rivers.

Analyses for the Estimation of Total Mortality Reference Points

Growth

The SAS developed a hierarchical Bayesian von-Bertalanffy growth model (VBGF) to estimate length-at-age at different spatial scales, including coastwide, stock region, and individual rivers, accounting for the impacts of aging method (scales or otoliths) and sex. Uncertainty in parameter estimates were derived from the posterior distributions for each parameter.

Results from the analysis indicated females were consistently larger than males at a given age, and that scales resulted in a lower maximum size ($L\infty$) compared to otoliths. While there were differences across rivers in growth estimates, there were no consistent patterns across rivers spatially.

The panel noted this was a thorough and well-done modeling effort, but suggested future exploration of changes in growth over time was warranted. Due to the current runtime of the

model, the Panel recommended preliminary explorations that looked at time blocks as opposed to years, and estimating parameters initially at broader spatial scales (coastwide or stock region) to see if there is a temporal influence. It was noted that priors were based on a subset of the data, in order to improve model runtime. Specifically, in the assessment report (page 112) it reads "variances for all hyper-parameters were specified using half student-t priors with 3 degrees of freedom, a mean of zero, and a scale parameter (v) derived from the data for each species." The Panel questioned this approach, and worried that differences among rivers were largely an artifact of variability arising from low river-specific sample size and the effect of the assumed priors, rather than capturing real life history differences among populations. The Panel feels discussion of the potential impacts of the approach versus other priors is warranted. Sensitivity analyses could be conducted to discern the impact of this assumption.

Natural Mortality (M)

Estimates of weight-at-age were used to estimate M-at-age using the Lorenzen (1996) method. The panel noted Lorenzen was a widely-used and reasonable approach to estimate M. Uncertainty in M was based on uncertainty in weight-at-age, as well as the uncertainty in the parameters relating weight- and M-at-age estimated by Lorenzen (1996). Age-based estimators of M were also discussed by the panel. However, reliance on a maximum age estimate may be problematic based on the sampling design, the portion of the run sampled, and the magnitude of uncertainty in age assignments. The panel felt overall this was a useful approach to calculate M with uncertainty. However, the panel also noted the details were limited in the assessment report on the estimation of the length-weight relationship and uncertainty in the parameters.

Maturity

Proportion mature-at-age was estimated following the approach of Maki et al. (2001) that is based on spawning marks in scales. The approach requires assumptions about ages of full maturity and immaturity, and the SAS assumed all fish younger than 3 were immature, and all fish older than 5 were mature. Thus, the proportion mature at ages 3-5 was estimated for each species by sex at the area grouping level. The SAS noted the method assumes equal survival between mature and immature fish. However, the assumption is likely violated given the different sources of mortality faced by mature fish that return to freshwater to spawn. Uncertainty in maturity ogives by region were derived by bootstrapping of the Maki et al. (2001) approach, which produced standard errors for the proportion mature for ages 3-5. Overall, the panel felt this was a suitable approach for deriving sexual maturity ogives for alewife and blueback herring.

Selectivity

Estimation of selectivity-at-age by region was not possible at the river or stock region level due to limited information on in-river removals, as well as uncertainties in how the coastwide catch is distributed across individual stocks and ages within stock. As a result, selectivity-at-age was derived from the maturity-at-age estimates. The SAS assumed fully mature fish were fully selected in the fishery, and partially mature ages (3-5) had a selectivity proportion that was ≥ the maturity proportion for a given age. The SAS generated random selectivities by first drawing

random maturities at age, then adding a uniform random variable to this proportion that was bounded to keep selectivity between the random maturity proportion and 1 for a given age. Then, they fit a logistic curve to approximate selectivity, and associated variability, for immature fish. While unconventional, the panel felt this was a reasonable attempt to characterize mortality for immature fish.

Z SPR-based Reference Points

The SAS developed stochastic SPR models to estimate the total mortality (Z) that would reduce the population spawning biomass to 40% of the unfished level (Z40%). The SAS discussed the possibility of other percentages, and based their selection of 40% on previous studies evaluating the question in a simulation framework. For each species and area grouping, 5,000 sets of parameters were drawn for M-, maturity-, selectivity-, and weight-at-age, and Z40% was calculated for each set. The parameter draws were independent and did not account for potential covariation among parameters. The panel noted that accounting for covariation might reduce the extreme right-skew in the distribution of the reference points and give a more representative estimate for the upper confidence interval. Parameter draws were based on joint distributions from individual rivers within the regional groupings, which resulted in some unusual distributions for some inputs (e.g., bimodal $L\infty$ for an area), and also provided even weight to rivers within the regional groupings. Although the panel had concerns about these issues, overall they concluded it was a reasonable approach to calculate Z reference points with uncertainty.

Z Estimates

The SAS calculated total mortality (Z) over time across rivers with sufficient age information for comparison with the Z40% reference points. They explored using the Chapman Robson method for estimating Z, but ultimately used a Poisson GLM model based on the analysis of Nelson (2019) who showed it was one of the least biased methods under multi-stage cluster sampling. They assumed the first age at full selection was five, corresponding to the age of full maturity, and included rivers that had at least 3 ages with a minimum of 30 fish total. Uncertainty in Z estimates were based on the standard error estimated from the Poisson model.

The panel felt this was a useful approach overall, but there were some concerns identified. First, the Poisson model included a correction for overdispersion that occasionally resulted in infinite standard errors, when data were actually underdispersed rather than overdispersed. The SAS attempted to address the issue and ultimately utilized an approach that ignored the correction factor when underdispersion occurred. The net result of the change was that standard errors were lower for both alewife and blueback, on average. The panel also noted the method of using catch-at-age in a given year is sensitive to cohort effects, which could result in estimates of Z biased either high or low. Also, due to run sampling timing, later sampling of younger spawners could produce Z estimates that were positively biased. The panel suggested exploration of the Sinclair (2001) method, to estimate Z across cohorts by aggregating data across three to five years and calculating a common slope and different intercepts for each cohort. Being able to use all of the age data rather than having to exclude

information below the age of full selectivity could also be beneficial, particularly because sample sizes were low in some rivers. This was particularly important in the terminal year where small changes in numbers would have greater influence. The GLMM method developed by Billard (2020) that fits a catch curve using the number of previous spawnings, rather than age class, as the predictor variable in the regressions, and factoring the data by age at maturity. Applicability of the method would require non-negligible numbers of fish spawning three or four times to reliably fit the curve, similar to how the original catch curve method used at least three fully-selected age classes.

Last, by using data based on age 5+ fish, the analysis becomes restricted to only fully mature fish when natural mortality is expected to be at its lowest (Fig. 91-98). Mortality during younger age classes that contributed most to the observed run count is not able to be estimated, as the proportion of the adult spawning population is composed mostly of first-time spawners (Fig. 113-115, Fig. 132, Fig. 144, Fig. 174, Fig. 178, Fig. 191, Fig. 197, Fig. 215). Thus, the mortality rate represents only the oldest ages, and not the peak abundance exposed to bycatch.

Trend Analyses

The SAS conducted trend analyses on different sources of information using the Mann-Kendall non-parametric test for monotonic trends, and the auto-regressive integrated moving average (ARIMA) model. Both methods were applied to indices of abundance from surveys and run count data, and the Mann-Kendall method was also applied to mean length and length-at-age trends, and proportion of repeat spawners. For a given data set the Mann-Kendall test was applied for the full time series, and from 2009 onwards, to look at overall versus recent trends. Uncertainty was incorporated in the ARIMA model via bootstrapping to calculate the percentage of times the terminal year smoothed value was above the 2009 value, as well as the 25^{th} percentile for the entire time period (reference points are discussed in more detail in ToR 5). Overall, the Panel felt the Mann Kendall and ARIMA methods were suitable for looking at trends over time.

Index Standardization

Survey indices-of-abundance were included in the trend analysis for surveys with consistent methodology over time, at least 10 years of consecutive data, and ≥ 10% positive tows for river herring in suitable strata, months, and stations. For stratified random design surveys, the stratified arithmetic mean was calculated for each year. For other surveys, the SAS explored the use of GLMs and GAMs with different covariates, as well as the delta and geometric mean. The SAS selected the delta mean over the geometric mean due to lower bootstrapped means overall, and only considered the model-based estimates if they reduced the interannual variability in the estimates. The Panel had some concerns about comparing CVs as a model selection tool, detailed under TOR 2.

Correlation Analysis

With indices of abundance, the SAS conducted pairwise Spearman's correlations by species and rivers within the regional grouping areas to look for consistent trends over time in indices used

for trend analysis. Overall, there were few correlations within regions. The panel felt this was an interesting and useful analysis. There was some discussion that comparisons across all rivers and different indices might be interesting. One might expect rivers that are far apart, yet have similar remediation efforts, to be correlated in time.

MARSS Model

In addition to the pairwise correlation analysis, the SAS conducted a multivariate auto-regressive state space model (MARSS) to explore common trends in indices by region. Limited detail was provided regarding the model development and fitting. It was noted the MARSS approach was not pursued in great detail due to model fitting issues, including inconsistent trends within regions. The panel agreed that trying to identify patterns in rivers within regions was of great interest. However, an analysis that looked for trends across the entire region is also of interest, in part due to adjacent rivers being split between regions. Also, other factors may play a role at broader spatial scales (e.g., restoration efforts or development trends across rivers).

Power Analysis

The SAS conducted a power analysis following the method of Gerrodette (1987) to calculate the probability of detecting trends in abundance indices from the surveys. Specifically, they looked at the probability of detecting a ≥ 50% change over a 10 year period for both linear and exponential trends. The SAS noted this is not a retrospective power analysis often done after testing for a trend. Rather, it is a measure of the possibility of identifying a trend if one were to occur. The panel felt this was a very useful analysis, as it revealed a very low probability to detect significant trends if they were to occur over 10 years.

Trends in Maximum Age, Mean Length, Length-at-age, and Proportion of Repeat Spawning

The SAS explored trends in age, length, and repeat spawning over time where possible. The panel felt the analyses were interesting and useful. However, care was needed when using trends in the data to make inferences about stock status, as other dynamics including the sampling design and changes in personnel may be influencing the observed data.

Trends in maximum age by species and sex were explored across rivers where age information was available. Trend analyses were not conducted on maximum age, and trends were evaluated visually. Rivers where changes in ageing method changed over time were split. Maximum ages ranged between 4-9 across rivers with ages 6-7 most common. Over time values fluctuated. In general, there was no discernible trend across the majority of rivers. The panel noted that observed maximum age for a given river may be influenced by the timing of the sampling relative to the run timing, and therefore may not be reflective of the true maximum age returning to a river.

Length data from fishery-independent and -dependent sources were collected to calculate trends in overall mean length and length at age for individual spawning populations. Time series

with at least 10 years of data and with at least five years of continuous data were used in Mann-Kendall tests for a monotonic trend. The SAS noted that year-class effects can influence trends in mean length (but not mean length-at-age), particularly for shorter time series. The panel also suggested looking at changes in mean length in the NMFS offshore trawl survey to get a more coastwide look at changes in size, as there are some length-based data limited methods that could be explored for adjusting the bycatch cap.

The percentage of repeat spawners was calculated as the percent of fish sampled with one or more spawning marks divided by the total sampled in a given year. The Mann Kendall test was applied for rivers for 10+ years of data, with at least five continuous years. A few rivers stood out as they had large increases towards the end of the time series, with very high percent repeat spawners. Although this seemed to be a positive result at first glance, the panel noted it could also be the result of successive year class failures. In response, the SAS conducted a simulation of the data and demonstrated that indeed year class failure could be responsible for such changes. It might be useful in the future to structure the data so that figures showing each river or regional grouping could allow for visual evaluation of the various indices and facilitate attempts to make inferences about biological processes. The aging of scales and detection of repeat spawning events using them remains a source of variability that is hard to quantify. Last, the panel was concerned with the very low number of repeat spawners in some years (eg. 2018 in CAN-NNE, Fig. 174).

Statistical Catch-at-Age Models

Statistical catch-at-age (SCAA) models were updated for stocks in three rivers. Catch-at-age models are discussed in detail below in response to ToR 4.

Bycatch Cap Limit

The SAS explored the use of data-limited methods to estimate a bycatch cap based on trends in abundance. The SAS clearly indicated this was a proof-of-concept analysis and not being recommended for management purposes. Five methods were explored: the iSmooth method, used to adjust the ABC for a number of stocks in New England, and four variations of the iSlope method. Both the iSmooth and iSlope methods were selected because they performed well in simulation testing conducted by an Index-Based Methods Working Group (NEFSC 2020). Both iSmooth and iSlope adjust recent average catches based on trends in abundance. The SAS used recent bycatch estimates, and explored adjusting the catch using two indices of abundance: the NMFS trawl survey (ME-NC), and summed run counts from the SNE stock region for alewife and from the MAT region. The SAS also conducted a retrospective analysis to quantify the interannual change in bycatch cap that would have resulted if each method had been applied previously.

The panel felt this was a useful exploration and worthy of further consideration. There was some concern about the interannual variability in cap estimates, particularly for the iSmooth method. The iSlope variations were less variable than iSmooth, although there was considerable variation for blueback herring in some years. The variability was largely due to

spikes in bycatch in certain years. There was discussion that using bycatch magnitude as the catch cap could be problematic. If this approach were to be used, the current bycatch cap should be adjusted up or down (and not the recent average bycatch) based on trends in the index. The panel was also unsure how the approach could be operationalized to set a bycatch cap that includes four species (also American and hickory shad), and feels that further consideration of how to do so is needed.

Spatial Distribution Models

The SAS also presented the potential use of habitat models to predict species distribution in the marine environment and identify bycatch hotspots. The models would inform future development of time-area closures and could be explored as an alternative to management using a bycatch cap. The panel agreed the methods held promise and supported continued exploration, while cautioning that a fully spatial approach would not inherently track the magnitude of bycatch. Thus, there is the potential that some type of bycatch cap would need to be implemented concurrently with spatial management. The panel also noted there are numerous steps to developing and validating various options for time area closures, and these require clear management objectives to be defined *a priori* (Bowlby et al. 2024).

4. **For each stock, identify best estimates of biomass, abundance, and exploitation from the assessment for use in management, if possible, or specify alternative estimation methods.**

Despite the diversity of data available, it was difficult for the SAS to use conventional fish population modeling to estimate biomass or abundance of river herring, either by river system or by region. For the majority of river systems, only one type of monitoring data existed that could be used as an abundance index. And, the available catch data were difficult to partition to species level due to challenges in biological sampling. There were only three rivers where a statistical catch-at-age model could be developed to estimate biomass/abundance and fishing mortality.

Monument River Statistical Catch-at-Age Model

The statistical catch-at-age (SCA) model for the Monument River (MA) alewife was a forward projecting population model that predicts numbers at age by sex and maturity stage from total in-river catches, escapement counts, and escapement age composition. The SCA incorporated the updated estimates of natural mortality (M) by age derived from weight at age (Lorenzen 1996) and used the age and repeat-spawner frequency to derive annual proportions of fish mature at each age and sex following Maki et al. (2001). The structural difference from the last assessment was to incorporate a multiplier on M, to give a coefficient for two time periods: 1980-1999 and 2000-2022. Fishing mortality is currently extremely low and known (only research catches), making it possible to evaluate changes in M over time because escapement was monitored.

Model diagnostics were adequate, yet there were retrospective patterns in several parameters, notably total population abundance and female SSB. The river system is currently under moratorium, so there is limited management application for the results other than determining a relative current mortality rate. The biomass predictions in the terminal year for female SSB are below both the $F_{40\%}$ and $F_{20\%}$ reference points, suggesting recent abundance is low. The panel noted the increase in the M multiplier (1.67 to 2.68) was interesting, as it suggests other sources of anthropogenic mortality (not F) have substantially increased in this population in recent years.

Nanticoke River and Chowan River Statistical Catch-at-Age Model

Age-structured SCA models for alewife and blueback herring were developed for both rivers. Models were fit to total in-river catches, observed proportions at age and repeat spawner data, and fishery-independent indices. Unlike the Monument River model, additional anthropogenic mortality (e.g., multipliers on M) could not be estimated concurrently with fishing mortality due to the lack of information on escapement. Both rivers are currently under moratorium and recent estimates of F were minimal. Sensitivity runs indicated that biomass predictions were sensitive to the scale of removals, limiting the management utility of both models now that there are no directed fisheries. The influence of bycatch, other sources of anthropogenic mortality, or environmental effects due to climate change could not be evaluated from the available data. Any assumptions made as to their magnitude would rescale abundance estimates from the models.

Overall

Predicting biomass or abundance for alewife and blueback herring depends on having substantial extant monitoring effort in a single river. Given the sheer number of river systems, it is unlikely that future monitoring will ever be increased across systems to enable the development of additional SCA models. Furthermore, age-structured SCA approaches are not applicable at the regional level, given the diversity in population dynamics among river systems, coupled with separability issues for aggregated species data such as bycatch information. The review panel sees limited value in future model development and validation of the SCA models for management advice.

In future, the SAS could explore using population dynamics models within a Population Viability Analysis (e.g., Reid et al. 2002, Legault 2005), particularly for the Monument River. This type of an approach would shift the focus from stock status towards conservation questions and recovery planning. For example, the predominance of in-river as opposed to at-sea mortality affecting the population trajectory (e.g., Gibson et al. 2009), the potential utility of stocking (e.g., Bowlby and Gibson 2011), or the probabilities of recovery and/or extinction under various mortality scenarios (e.g., Gibson et al. 2015) could be explored. However, the assessment team noted this suggestion is effectively a simpler version of the habitat model discussed below, albeit implemented at a river-specific level.

Habitat Model

The habitat model presented for river herring was an extension of the one previously developed for American shad (Zydlewski et al. 2021) and is available via open source software. It is an age and sex structured projection model that uses current biological parameters (here regional, not river-specific values) to predict survival, maturity and productivity through time (here 50 years), conditional on the distribution and accessibility of freshwater habitat. Density dependence via a Beverton-Holt recruitment function relates the number of spawners to subsequent larval recruitment. Upstream passage and downstream mortality rates govern the probabilities of reaching suitable habitat (i.e., in freshwater for adult spawners and in ocean environments for larval recruits).

The model was initialized at a large starting population size, with the number of individuals in an age class determined by age-specific natural mortality rates and a random probability of being female drawn from a beta distribution. The amount of freshwater habitat in a river system was calculated for each reach segment using stream discharge-width relationships and summed with lake area to get the total. The position of dams in combination with modeled upstream passage and downstream survival rates affected the accessibility of freshwater habitats. The model was run for alewife and blueback herring in each region identified by the genetic analyses (see TOR 1), comparing a no-dam (1.0 upstream passage and downstream survival), a current (0.5 passage and survival), and a no-passage (0 passage and survival) scenarios.

The habitat model conclusively demonstrated the impact of accessibility on the expected productivity of different regions for river herring, with the magnitude of habitat reduction within a region reflected by decreases in predicted spawner abundance (in millions of fish). For alewife, all of the regions had 65% or more of the habitat located above first dams. For blueback herring, the proportions of habitat above dams tended to be slightly lower by region; however, for both species there was a gradient in habitat accessibility from South to North, with Northern rivers being more impacted by dams. The current model is sensitive to the amount of habitat that would remain after dam removals, and assumes all habitat to be of equal quality. These assumptions currently limit the applicability of the model, as it is known that all habitat is not equal (Monteiro Pierce et al. 2020, Devine et al. 2021), and choices between fish passage and dam removal will have significant impacts on habitat availability and quality.

For the habitat model to be used to develop explicit management advice, it would be necessary to account for the influence of fisheries, both in-river as well as ocean bycatch, as well as to compare abundance predictions to observed data to ensure sources of mortality and life history dynamics are adequately represented. Ideally, landings and bycatch would be ascribed to individual river systems to understand the combined influence of freshwater habitat loss and fishing mortality on underlying population productivity. By capturing the main sources of freshwater and at-sea mortality, the abundance predictions (estimates of numbers) could then be assessed relative to run count and escapement data to see if the modeling approach is able to approximate observed patterns. This would help validate the predictions, particularly if there is the intention to explore other sources of anthropogenic mortality (e.g., the influence of

climate change) using the modeling approach. Overall, we encourage the SAS to continue development of the habitat modeling approach.

5. **Evaluate the choice of reference points and the methods used to determine or estimate reference points. Determine stock status from the assessment, or, if appropriate, specify alternative methods/measures for management advice.**

The SAS developed reference points for total mortality (Z) and for the ARIMA-smoothed time series. The reference points were then used to compare terminal estimates of Z and smoothed abundance to quantify the probability of a stock being above or below the reference point. Uncertainty was accounted for in both the terminal estimate and the reference point.

For the Z reference point, the SAS used the SPR target of 40%. Their justification for using 40% was based on a number of simulation studies that showed 40% was a robust proxy for MSY. The Panel discussed the possibility of other target SPR percentages, but also noted 40% is widely used across stocks in the U.S., and that it was reasonable for river herring.

Regarding status relative to Z, results varied by river. For blueback herring, 4 of 11 rivers had a greater than 50% chance of Z being above the reference point. For alewife, 28 of 43 rivers had a greater than 50% chance of Z being above the reference point. Although the Panel felt this approach was suitable, there was discussion over using only the terminal year estimate of Z to compare with the reference point. There is considerable interannual variation in Z, and averaging multiple years (e.g., the most recent three) may be more appropriate. Also, as noted earlier the mortality being estimated for each river is based on fully recruited 5+ year fish and thus does not represent the mortality rate of younger age classes. Ages 3 and 4 are the predominant contributors to annual variability in the run count, as most populations consist of a majority of first-time spawners. Although mortality affecting the older age groups is an accumulated metric over multiple factors (harvest, incidental catch, and fish passage), mortality is generally expected to be higher in younger and small ages. This is made slightly more complicated by a lack of mortality as a result of river use such as through fish passage during younger ages. However, length data collected in the observer program (Fig. 17-Fig. 18) demonstrate there is significant catch of young (immature) river herring as judged by the growth curves (Fig. 91-98). In fact, there are very few fish in bycatch at lengths that are consistent with age 5+ fish (approximately 275-300mm, Fig. 91-98). Thus, the calculated mortality rates are not truly indicative of all sources of mortality river herring are exposed to throughout ontogeny. Using the catch curve analysis method based on previous spawning history (Billard 2020) would better characterize mortality in earlier years as data from age 3 and 4 fish would be included in the estimation. Even though mortality is likely underestimated, the mortality rate had a 50% chance of being above the reference point for 50% of blueback populations and 65% of alewife populations. What is clear is that mortality remains high, and given the level of historical depletion throughout their respective ranges, does not bode well for recovery of either alewife or blueback herring. It is important to note the mortality rates were over the reference point in many harvested runs as well.

For the ARIMA trend analysis the SAS used two reference points – the 25th percentile from the entire smoothed time series, and the 2009 smoothed value. The 25th percentile was selected based on the work of Helser and Hayes (1995). The 2009 value was based on changes in management related to FMP Amendment 2. The Panel felt the focus should be more on the 2009 index value, in part because the 25th percentile can change over time and the 2009 value tended to be higher than the 25th percentile value. The 2009 smoothed index is fixed in time. It has relevance to known changes in management and should be considered a limit reference point. Therefore, comparisons of the current year to 2009 provide evidence if interventions are having a positive impact. With regard to status relative to reference points, the majority of rivers for both species had a greater than 50% chance of the index terminal year being above the 25th percentile and the 2009 value.

6. **Review the research, data collection, and assessment methodology recommendations provided by the TC. Make additional recommendations as necessary. Clearly prioritize the research needed to inform and maintain the current assessment, and provide recommendations to improve future assessments.**

The panel suggested de-prioritizing research questions that would not lead to information used to assess status. The panel categorized research priorities as short-term high priority that are possible now without additional data collection, and medium priority that would require additional planning, new data collection, or additional time to implement.

High Priority

The panel recognizes the need for improved estimation of bycatch and discard mortality. Exploring different estimation methods among fisheries is a high priority as it can be done now with no new data. Different analytical techniques could be compared in a sensitivity analysis to assess their relative predictive ability for estimating total bycatch. The manner in which iSlope or other methods could be implemented as catch caps should be explored. Since incidental catch seems to comprise the largest source of ongoing fishing mortality, and mortality remains high for many populations, the focus on bycatch is urgent.

Another high priority research need is to improve the habitat model by incorporating all major sources of mortality, and then to use observed data to ground truth the outputs. This does not imply a fit to data, but rather the results should be tethered to reality in that predicted run sizes are of a realistic magnitude relative to what has been observed. There were a number of unrealistic outputs in the current implementation. Future iterations should work to include fishing mortality, including bycatch, and measures of habitat quality in freshwater.

Of equal priority, but with implementation over a longer time period, is improved monitoring via port sampling to collect morphological and species data from bycatch. This would require portside monitoring to be reinstated and expanded for full-retention fisheries. However, it would appear to be a relatively low-cost solution compared to increasing at-sea observer coverage. The variability in bycatch estimate CVs relative to a target of 30% suggests increases in at-sea observer coverage would have to be substantial. During subsampling of catch, samples

should be taken for genetic analysis of bycatch, even if the samples are stored for analysis at a later date. A better accounting of incidental catch is critical to improving the status of coastwide stocks.

The panel also sees a high priority in continued improvement of enumeration techniques, including hydroacoustics, eDNA, and run count video image processing with machine learning. Current fish counting technologies are phasing out. The advance of many alternatives offers the opportunity to calibrate methods and continue long-term monitoring datasets.

Medium Priority

The panel recognized the need to implement sampling programs where data are collected over the whole life stage on a single river. Such data can be input into models to allow the partitioning of mortality into different components of life history, increasing understanding of the impacts of different sources (in-river, downstream passage, incidental catch).

A detailed river history and inventory that captures current population numbers, details of restoration, and documents data collection methods would be very informative when trying to interpret current status. This could include a landscape database of threats, documenting their location, type, and magnitude along the river network. Such a baseline would help evaluate whether the environment of the river has changed. The status of current environmental monitoring, prior or subsequent run monitoring, as well as other information could help in prioritizing the collection of new data. It would also provide a platform for research and engagement.

River herring specific surveys would be of great benefit to the assessment, and the panel suggests interspecies and interstate collaboration on survey design. The low power of surveys in the assessment can, in part, be linked to the dependence on a variety of surveys not developed for river herring. At the very least, new workshops to standardize data collection and explore expanding the designs to better sample river herring in current surveys, or implementing additional methods to complement existing efforts, would be extremely useful. Angler surveys in freshwater or in spawning reaches, currently not the focus of MRIP, would fill some data holes. However, recreational harvest is probably not resulting in significant mortality.

The panel considered most of the other medium and high priority research objectives identified by the SAS (short and long term) to be less important, primarily because they would have a lower likelihood of leading to information useful for status assessment or management.

7. Recommend timing of the next benchmark assessment and assessment updates, if necessary, relative to the life history and current management of the species.

The review panel took into consideration the life history of river herring, the available assessment methods, and current management when recommending the timing of the next

benchmark and update assessments. The review panel agreed with the SAS that an assessment update in 5 years and a benchmark assessment in 10 years would be appropriate.

Relative to life history, 5 years represents approximately 1 generation for river herring, based on the average age of spawners. There would be sufficient time for recruits in 2024 to contribute to the spawning population prior to the next benchmark. However, the current assessment demonstrates the power to detect trends in monitoring data can be quite low given the variability characteristic of river herring, particularly with shorter time series. Thus, continued improvement of the habitat model and linking of the results to ground-truthing data would be logical steps.

In the assessment, 10 years was used as a cut-off when identifying the time series data appropriate for trends analyses. Holding the next benchmark assessment in 10 years should allow for measurable population response to management actions, particularly from those implemented following the previous benchmark in 2012.

The complexity of river herring assessment largely stems from the diversity of organizations involved in monitoring, data collection, and management, as well as the numerous anthropogenic activities affecting each population. More frequent assessments would take substantial effort on behalf of numerous agencies with little expectation of measurable population response. An update or a benchmark on a shorter time-scale is likely to lead to the same biological conclusions and management advice as the current assessment. The panel also suggests additional inter-assessment coordination amongst states to develop as many standardized approaches (ageing, spawning checks, indices) as possible.

8. **Prepare a Review Panel terms of reference and advisory report summarizing the panel's evaluation of the stock assessment and addressing each peer review term of reference. Develop a list of tasks to be completed following the workshop. Complete and submit the report within 4 weeks of workshop conclusion.**

The panel was generally content with the current assessment report. However, documentation of sample sizes for catch curve estimation should be included. In future assessments, the SAS should also work to explore time blocks in simplified growth models, and evaluate the assumptions underlying the catch ratio estimator for bycatch. We thank the SAS for recalculating mortality estimates, and providing additional figures and spreadsheets describing sample sizes, at the request of the panel during the peer review workshop.

LITERATURE CITED

Bowlby, H.D. and Gibson, A.J.F., 2011. Reduction in fitness limits the useful duration of supplementary rearing in an endangered salmon population. *Ecological Applications*, 21(8): 3032-3048.

Bowlby, H.D., Druon, J.N., Lopez, J., Juan-Jordá, M.J., Carreón-Zapiain, M.T., Vandeperre, F., Leone, A., Finucci, B., Sabarros, P.S., Block, B.A. and Arrizabalaga, H., et al. 2024. Global habitat predictions to inform spatiotemporal fisheries management: Initial steps within the framework. *Marine Policy*, 164: 106-155.

Cotter, A. and Pilling, G., 2007. Landings, logbooks and observer surveys: improving the protocols for sampling commercial fisheries. *Fish and Fisheries*, 8(2): 123-152.

Devine, M. T., Roy, A. H., Whiteley, A. R., Gahagan, B. I., Armstrong, M. P., & Jordaan, A., 2018. Precision and relative effectiveness of a purse seine for sampling age-0 river herring in lakes. *North American Journal of Fisheries Management*, 38(3): 650-662.

Devine, M. T., Rosset, J., Roy, A. H., Gahagan, B. I., Armstrong, M. P., Whiteley, A. R., & Jordaan, A., 2021. Feeling the squeeze: adult run size and habitat availability limit juvenile river herring densities in lakes. *Transactions of the American Fisheries Society*, 150(2): 207-221.

Dumelle, M., Higham, M., Ver Hoef, J. M., Olsen, A. R., and Madsen, L. (2022). A comparison of design-based and model-based approaches for finite population spatial sampling and inference. *Methods in Ecology and Evolution*, 13(9): 2018–2029.

Gerrodette, T., 1987. A power analysis for detecting trends. *Ecology*, 68: 1364.

Gibson, A.J.F., Jones, R.A., and Bowlby, H.D., 2009. Equilibrium analyses of a population's response to recovery activities: A case study with Atlantic salmon, *North American Journal of Fisheries Management*, 29(4): 958-974.

Gibson, A.J.F., Bowlby, H.D. and Levy, A.L., 2015. Dynamics of Endangered Eastern Cape Breton Atlantic Salmon Populations. *North American Journal of Fisheries Management*, 35(2): 372-387.

Gibson, A.J.F., Bowlby, H.D., and Keyser, F.M. 2017. A Framework for the Assessment of the Status of River Herring Populations and Fisheries in DFO's Maritimes Region. *DFO Can. Sci. Advis. Sec. Res. Doc*. 2016/105. vi + 69 p.

Helser, T. E. and D. B. Hayes. 1995. Providing quantitative management advice from stock abundance indices based on research surveys. *Fishery Bulletin* 93: 290-298.

Hordyk, A. R., Huynh, Q. C., and Carruthers, T. R., 2019. Misspecification in stock assessments: common uncertainties and asymmetric risks. *Fish and Fisheries*, 20(5): 888-902.

Legault, C.M., 2005. Population viability analysis of Atlantic salmon in Maine, USA. *Transactions of the American Fisheries Society*, 134(3): 549-562.

Monteiro Pierce, R., Limburg, K. E., Hanacek, D., & Valiela, I., 2020. Effects of urbanization of coastal watersheds on growth and condition of juvenile alewives in New England. *Canadian Journal of Fisheries and Aquatic Sciences*, 77(3): 594-601.

Nelson, G.A., 2019. Bias in common catch-curve methods applied to age frequency data from fish surveys. *ICES Journal of Marine Science* 76: 2090-2101.

Poulet, C., Lassalle, G., Jordaan, A., Limburg, K.E., Nack, C.C., Nye, J.A., O'Malley, A., O'Malley-Barber, B., Stich, D.S., Waldman, J.R. and Zydlewski, J., 2023. Effect of straying, reproductive strategies, and ocean distribution on the structure of American shad populations. *Ecosphere*, 14(12): 4712.

Quinn, T.P., 1993. A review of homing and straying of wild and hatchery-produced salmon. *Fisheries Research*, 18(1-2): 29-44.

Koch, I.J. and Narum, S.R., 2021. An evaluation of the potential factors affecting lifetime reproductive success in salmonids. *Evolutionary Applications*, 14(8): 1929-1957.

Reed, J.M., Mills, L.S., Dunning Jr, J.B., Menges, E.S., McKelvey, K.S., Frye, R., Beissinger, S.R., Anstett, M.C. and Miller, P., 2002. Emerging issues in population viability analysis. *Conservation biology*, 16(1): 7-19.

Sinclair, A.F., 2001. Natural mortality of cod (*Gadus morhua*) in the Southern Gulf of St. Lawrence. *ICES Journal of Marine Science* 58: 1-10.

Smith, S.J. and Gavaris, S., 1993. Improving the precision of abundance estimates of eastern Scotian Shelf Atlantic cod from bottom trawl surveys. *North American Journal of Fisheries Management*, 13(1): 35–47.

Stock, B.C., Ward, E.J., Eguchi, T., Jannot, J.E., Thorson, J.T., Feist, B.E., and Semmens, B.X., 2020. Comparing predictions of fisheries bycatch using multiple spatiotemporal species distribution model frameworks. *Canadian Journal of Fisheries and Aquatic Sciences*, 77(1): 146-163.

Stock, B. C., Ward, E. J., Thorson, J. T., Jannot, J. E., and Semmens, B. X., 2019. The utility of spatial model-based estimators of unobserved bycatch. *ICES Journal of Marine Science*, 76(1): 255-267.

Wigley S.E., Rago P.J., Sosebee K.A., and Palka D.L., 2006. The Analytic Component to the Standardized Bycatch Reporting Methodology Omnibus Amendment: Sampling Design, and Estimation of Precision and Accuracy. *US Dep. Commer., Northeast Fish. Sci. Cent. Ref. Doc.* 06-22: 135.

Yan, Y., Cantoni, E., Field, C., Treble, M., and Flemming, J. M., 2022. Spatiotemporal modeling of bycatch data: methods and a practical guide through a case study in a Canadian Arctic fishery. *Canadian Journal of Fisheries and Aquatic Sciences*, 79(1): 148-158.

Atlantic States Marine Fisheries Commission

River Herring Benchmark Stock Assessment: Terms of Reference Report

Draft for Board Review

Vision: Sustainable and Cooperative Management of Atlantic Coastal Fisheries

Prepared by the
ASMFC River Herring Stock Assessment Subcommittee
Margaret Conroy, Chair, Delaware Division of Fish and Wildlife
Jason Boucher, NOAA Northeast Fisheries Science Center
Michael Brown, Maine Division of Marine Resources
William Eakin, New York Department of Environmental Conservation
Ben Gahagan, Massachusetts Division of Marine Fisheries
Kyle Hoffman, South Carolina Department of Natural Resources
Trey Mace, Maryland Department of Natural Resources
John Sweka, US Fish and Wildlife Service
Joseph Zydlewski, University of Maine
Katie Drew, Atlantic States Marine Fisheries Commission
James Boyle, Atlantic States Marine Fisheries Commission
with
Daniel Stich, SUNY Oneonta

and the

ASMFC River Herring Technical Committee
William Eakin, Chair, New York Department of Environmental Conservation
C. Michael Bailey, US Fish and Wildlife Service
Ingrid Braun, Potomac River Fisheries Commission
Michael Brown, Maine Division of Marine Resources
Bradford Chase, Massachusetts Division of Marine Fisheries
John Ellis, US Fish and Wildlife Service
Ruth Haas-Castro, Northeast Fisheries Science Center
Kyle Hoffman, South Carolina Department of Natural Resources
Reid Hyle, Florida Fish and Wildlife Conservation Commission
Matthew Jargowsky, Maryland Department of Natural Resources
Kevin Job, Connecticut Department of Energy and Environmental Protection
Jeremy McCargo, North Carolina Wildlife Resources Commission
Patrick McGee, Rhode Island Department of Environmental Management
Patrick McGrath, Virginia Institute of Marine Science
Johnny Moore, Delaware Division of Fish and Wildlife
Brian Neilan, New Jersey Department of Environmental Protection
Brian Niewinski, Pennsylvania Fish and Boat Commission
Conor O'Donnell, New Hampshire Fish and Game Department
Jim Page, Georgia Department of Natural Resources
Ken Sprankle, US Fish and Wildlife Service
Joseph Swann, DC Department of Energy and Environment
Ted Castro-Santos, US Geological Service
Holly White, North Carolina Division of Marine Fisheries

A publication of the Atlantic States Marine Fisheries Commission pursuant to National Oceanic and Atmospheric Administration Award No. NA20NMF4740012.

TERMS OF REFERENCE

For the 2024 ASMFC River Herring Benchmark Stock Assessment

Board Approved November 2022

1. Define and justify stock structure.

2. Characterize precision and accuracy of fishery-dependent and fishery-independent data used in the assessment, including life history data (e.g., age and repeat spawner data) and nontraditional data (e.g., entrainment, impingement, passage). Characterization should include the following but is not limited to:
    a. Provide descriptions of each data source (e.g., time series, geographic location, sampling methodology and changes, potential explanation for outlying or anomalous data).
    b. Describe calculation and potential standardization of abundance indices.
    c. Discuss trends and associated estimates of uncertainty (e.g., standard errors).
    d. Where possible, explore reader consistency, potential bias, and agreement statistics for age and repeat spawner data.
    e. Justify inclusion or elimination of available data sources.

3. Estimate bycatch where and when possible.

4. Summarize data availability and trends by stock.

5. If possible, develop models used to estimate population parameters (e.g., Z, biomass, abundance) and biological reference points, and analyze model performance.
    a. Briefly describe history of model usage, its theory and framework, and document associated peer-reviewed literature. If using a new model, test using simulated data.
    b. Clearly and thoroughly explain model strengths and limitations.
    c. Discuss the effects of data strengths and weaknesses (e.g., temporal and spatial scale, gear selectivity, ageing accuracy, sample size) on model inputs and outputs.
    d. State assumptions made for all models and explain the likely effects of assumption violations on synthesis of input data and model outputs. Examples of assumptions may include (but are not limited to):
    - Choice of stock-recruitment function.
    - Calculation of M. Choice to use (or estimate) constant or time-varying M and catchability.
    - Choice of equilibrium reference points or proxies for MSY-based reference points.
    - Choice of a plus group for age-structured species.
    - Constant ecosystem (abiotic and trophic) conditions.
    e. Justify choice of coefficients of variation (CVs), effective sample sizes, or likelihood weighting schemes.
    f. Describe stability of model (e.g., ability to find a stable solution, invert Hessian).

g. Perform sensitivity analyses for starting parameter values, priors, etc. and conduct other model diagnostics as necessary.
h. Characterize uncertainty of model estimates and biological or empirical reference points.
i. If multiple models were considered, justify the choice of preferred model and the explanation of any differences in results among models.

6. If possible, develop methods to calculate a biologically-based cap or limit on bycatch of river herring in ocean fisheries.

7. Recommend stock status as related to reference points, if available.

8. Other potential scientific issues:
    a. Compare trends in population parameters and reference points with current and proposed modeling approaches. If outcomes differ, discuss potential causes of observed discrepancies.
    b. Compare reference points derived in this assessment with what is known about the general life history of the exploited stock. Explain any inconsistencies.
    c. Explore climate change impacts on the species.
    d. Explore predation impacts on the species.
    e. Discuss all known anthropogenic sources of mortality and productivity (i.e., stocking, passage mortality) by stock.

9. If a minority report has been filed, explain majority reasoning against adopting approach suggested in that report. The minority report should explain reasoning against adopting approach suggested by the majority.

10. Develop detailed short and long-term prioritized lists of recommendations for future research, data collection, and assessment methodology. Highlight improvements to be made by initiation of next benchmark stock assessment. Note research recommendations from the previous assessment that have not been addressed and those that have been partially or fully addressed.

11. Recommend timing of next benchmark assessment and intermediate updates, if necessary relative to biology and current management of the species.

For the 2024 ASMFC River Herring Benchmark Stock Assessment

1. Evaluate choice of stock structure.

2. Evaluate the thoroughness of data collection and the presentation and treatment of fishery-dependent and fishery-independent data in the assessment, including the following but not limited to:
    a. Presentation of data source variance (e.g., standard errors).
    b. Justification for inclusion or elimination of available data sources.
    c. Consideration of data strengths and weaknesses (e.g., temporal and spatial scale, gear selectivities, ageing accuracy, sample size).
    d. Calculation and/or standardization of abundance indices.
    e. Estimation of bycatch.

3. Evaluate the methods and models used to estimate population parameters (e.g., Z, biomass, abundance), biological reference points, and bycatch caps/limits including but not limited to:
    a. Evaluate the choice and justification of the preferred model(s). Was the most appropriate model (or model averaging approach) chosen given available data and life history of the species?
    b. If multiple models were considered, evaluate the analysts' explanation of any differences in results.
    c. Evaluate model parameterization and specification (e.g., choice of CVs, effective sample sizes, likelihood weighting schemes, calculation/specification of M, stock-recruitment relationship, choice of time-varying parameters, plus group treatment).
    d. Evaluate the diagnostic analyses performed, including but not limited to:
        - Sensitivity analyses to determine model stability and potential consequences of major model assumptions.
    e. Evaluate the methods used to characterize uncertainty in estimated parameters. Ensure that the implications of uncertainty in technical conclusions are clearly stated.

4. If a minority report has been filed, review minority opinion and any associated analyses. If possible, make recommendation on current or future use of alternative assessment approach presented in minority report.

5. Recommend best estimates of stock biomass, abundance, and exploitation from the assessment by stock for use in management, if possible, or specify alternative estimation methods.

6. Evaluate the choice of reference points and the methods used to determine or estimate them. Recommend stock status determination from the assessment, or, if appropriate, specify alternative methods/measures for management advice.

7. Review the research, data collection, and assessment methodology recommendations provided by the TC and make any additional recommendations warranted. Clearly prioritize the activities needed to inform and maintain the current assessment, and provide recommendations to improve the reliability of future assessments.

8. Recommend timing of the next benchmark assessment and updates, if necessary, relative to the life history and current management of the species.

9. Prepare a peer review panel terms of reference and advisory report summarizing the panel's evaluation of the stock assessment and addressing each peer review term of reference. Develop a list of tasks to be completed following the workshop. Complete and submit the report within 4 weeks of workshop conclusion.

TERMS OF REFERENCE SUMMARY REPORT

1. Define and justify stock structure

River herring stock structure was identified genetically by Palkovacs et al. (2014) and later refined by Reid et al. (2018). A robust baseline collection that covered the range of both species indicated four regional genetic groups of alewife (one in Canada (CAN), and three in the US, Northern New England (NNE), Southern New England (SNE), and Mid-Atlantic (MAT)) and five of blueback herring (Canada-Northern New England (CAN-NNE), Mid-New England (MNE), Southern New England (SNE), Mid-Atlantic (MAT), and South Atlantic (SAT)). Within regional genetic groups there was much weaker genetic differentiation between rivers; there were indications that genetic isolation by distance was highly affected by stocking. The stock assessment conducted analyses at the individual river level where possible, and used the genetic stock-regions of Reid et al. (2018) to pool data and summarize results across rivers.

2. Characterize precision and accuracy of fishery-dependent and fishery-independent data used in the assessment, including life history data (e.g., age and repeat spawner data) and nontraditional data (e.g., entrainment, impingement, passage)

Commercial landings data for 1881-1949 came from the US Fish Commission reports. Data for 1950-2022 came from the Atlantic Coastal Cooperative Statistics Program (ACCSP), which compiles fisheries data from state and federal databases along the Atlantic coast. The ACCSP database was queried for landings records of alewife, blueback herring, and river herring, and ACCSP staff validated the data with the states. Reported commercial landings averaged 1,016 mt (2.24 million lbs) from 2013-2022, compared to 27,923 mt (61.6 million lbs) from 1950-1969, the height of the directed fishery.

The earliest historical data is likely an underestimate of coastwide landings, as it relies on opportunistic canvassing of the fisheries, concentrating on the mid-Atlantic states. Although reporting has become more standardized and mandatory in recent years, identification to the species level remains unreliable. The vast majority of river herring landings are reported as alewife, even for states or rivers where blueback herring dominate the runs.

Estimates of incidental catch of river herring (both retained and discarded) in non-directed ocean fisheries were developed from the Northeast Fishery Observer Program (NEFOP) data, which observes catches on federally-permitted vessels in the Mid-Atlantic and New England region. Observer data for the gillnet and bottom trawl fleets goes back to 1989, but incidental catch estimates for the midwater trawl (MWT) fleets are only provided for 2005-2022 because marked improvements to NEFOP sampling methodologies occurred in the high-volume MWT fisheries beginning in 2005.

Estimates of river herring bycatch are frequently imprecise, with CVs ranging from 0.2 to over 1.0 at the annual level. This is due to the overall low observer coverage, which has declined in recent years due to budget issues; coverage in nearshore/state waters is even lower due to the

federal nature of the observer program. In addition, in high volume fisheries, it is difficult to identify river herring to the species-level.

Estimates of recreational harvest and live releases for river herring on the Atlantic coast come from the NOAA Fisheries Marine Recreational Information Program (MRIP), which uses a combination of effort surveys and angler-intercept surveys to develop those estimates. MRIP estimates of river herring recreational catch are highly variable from year to year, ranging from a minimum of less than 1,000 fish for alewife and zero for blueback herring in several years to maximums of 1.3 million alewife and 3.4 million blueback herring. The percent standard error (PSE) of the estimates are also high, with most years having a PSE of greater than 50%, and several years having a PSE of greater than 100%, even at the coastwide level. The MRIP angler-intercept survey that estimates catch per trip of each species does not occur above the head-of-tide, so in-river catches, where the directed fishery is most commonly prosecuted, are not captured by MRIP, contributing to the low precision of the estimates.

From 2013-2022, estimates of total river herring removals on the US Atlantic coast from all sources averaged 1,213 mt (2.67 million lbs) or approximately 4% of the average reported landings at the peak of the directed fishery (Figure 1). This represented an average of 6.83 million fish per year.

Fishery-independent data sets that caught river herring were evaluated and accepted or rejected for assessment use based on established criteria, including the length of the time series (at least ten consecutive years of data; surveys with 7-9 years of data were accepted for use in future updates but not included in the trend analysis results for this assessment) and the proportion of sampling events that were positive for alewife or blueback herring, when subset to the most representative strata, stations, months, etc. (at least 10% positive tows/hauls). A total of 43 fishery-independent surveys met the criteria for one or both species. Surveys ranged from Maine to Florida and included young-of-year surveys and age-1+ surveys (Figure 2). Young-of-year or spawning stock surveys that occurred in the nursery grounds or rivers were assigned to the stock-region that the river or estuary was in; surveys that occurred in the ocean were assigned to the coastwide mixed stock for each species. Gears included trawls, seines, gillnets, and electrofishing. The SAS explored using GLMs and GAMs to incorporate environmental information into the calculation of the abundance indices. If the model-based standardization reduced interannual variability or the CVs of a dataset or could account for changes in sampling methods that would otherwise require dropping years of data, the standardized index was used. Otherwise, the nominal index was used.

The major sources of uncertainty in the surveys were (1) the lack of a targeted design, with majority of the surveys being multispecies monitoring projects that did not target river herring, resulting in a high proportion of zero tows in the datasets, and (2) time-series length, with virtually all surveys starting in the 1980s or later, after the significant decline in the directed fishery.

Two fishery-dependent CPUE datasets were also included; the length of the time-series and consistent methods of sampling provided useful contrast in the trends in abundance, but the

ability to define effort in a detailed, consistent way over the time-series did increase uncertainty for those indices.

In addition to fishery-independent surveys, run counts were used as indices of abundance for river herring. Run counts were available from Maine through South Carolina for both species, although the majority of counts were from the northern end of the range. The major source of uncertainty for the run counts was the potential for changes in passage efficiency over time, due to factors like deliberate passage improvements or improvements in counting methodology, degradation of passage, or interannual variability in flow or other environmental factors. In addition, for a number of run counts, river herring were not identified to the species level for part or all of the time series. While the SAS attempted to restrict the years in the analysis to years of consistent methodology, it was not possible to account for all sources of variability. The SAS considered run counts to be indices of relative abundance rather than estimates of absolute abundance.

Biological data including lengths, weights, ages, and repeat spawner marks were available from fishery-dependent and fishery-independent sources. River herring have historically been aged using scales, using protocols first developed by Cating (1953) for American shad and Marcy (1969) for river herring. Although used extensively, these protocols have not been validated with known-age river herring. A 2014 ageing workshop for river herring found CVs greater than 5% across labs, and systematic bias across readings from paired scales and otoliths. Collection of otoliths has increased since the last benchmark, and several thousand otolith ages were available across multiple stock-regions for both species.

3. Estimate bycatch where and when possible

Estimates of incidental catch of river herring (both retained and discarded) in non-directed ocean fisheries were developed from the NEFOP data, at both the annual level and stratified by gear and region. From 2005-2022, the total annual incidental catch of alewife ranged from 22.7-537.8 mt in New England and 6.5-295 mt in the Mid-Atlantic. The dominant gear varied across years between paired midwater trawls and bottom trawls. Corresponding estimates of precision (coefficients of variation, CVs) exhibited substantial interannual variation and ranged from 0.01-10.61 across gears and regions. Total annual blueback herring incidental catch from 2005-2022 ranged from 8.2–186.6 mt in New England and 1.4-388.3 mt in the Mid-Atlantic. Across years bottom trawl, paired and single midwater trawls exhibited the greatest blueback herring catches. Corresponding CVs ranged from 0.01 – 3.56.

Total incidental catch estimates from 2020-2022 were among the lowest in the time series (2005-2022) for both alewife and blueback herring. From 2005-2019, incidental catch made up 27% of total removals in weight and 35% of total removals in numbers, but from 2020-2022, incidental catch was 7.5% of total removals in weight and 10% of total removals in numbers. These lower estimates of bycatch are related to the lower effort in the Atlantic herring and mackerel fleet in recent years, but are also affected by the lower levels of observer coverage and port sampling in those years.

4. Summarize data availability and trends by stock

Information on abundance and/or total mortality were available from 75 rivers or river systems, as well as the Atlantic Ocean, for one or both species, across all stock-regions.

Indices and run counts were analyzed with the non-parametric Mann-Kendall trend analysis (Mann 1945, Kendall 1975) to determine if a monotonic trend was present in each series. The autoregressive integrated moving average (ARIMA) approach (Box and Jenkins 1976) was used to minimize measurement error in the survey estimates and to infer population status relative to an index-based reference point for both abundance indices and run counts. The reference points used were the 25th percentile of the time series, and the index value in 2009, the year when Amendment 2 to the Shad and River Herring Fishery Management Plan was implemented.

There was no clear trend signal for either species across the coast. Even within the genetic stock-regions, individual rivers often differed in recent and long-term trends for both abundance and mortality. Overall, the northern most stock regions (NNE for alewife, CAN-NNE for blueback herring) had more rivers with significant positive trends than the other stock-regions.

For alewife, in the NNE stock-region, there were eight species-level time series: six run counts and two young-of-year surveys. ARIMA results indicated five of the six run counts and both young-of-year indices had a greater than 50% chance of being higher than they were in 2009. Four of the eight time-series showed an increasing trend over the full time series, while two of eight showed an increasing trend since 2009. The rest of the trends were non-significant. In the SNE region, there were eight species-level time series: seven run counts and one young-of-year survey. ARIMA results indicated four of the seven run counts had a greater than 50% chance of being higher than they were in 2009; the young-of-year index only had a 6% probability of being higher than it was in 2009. None of the time-series had a significant trend in recent years; four runs had had a long-term decreasing trend and one run had a long-term increasing trend. In the MAT stock-region, there were 21 species-level time series: eleven age-1+ indices and ten recruitment (young-of-year or age-1) indices. ARIMA results indicated five of the eleven age-1+ indices and six of ten recruitment indices had a greater than 50% probability of being higher than they were in 2009. None of the time-series showed a significant trend in recent years. One age-1+ index and three recruitment indices showed a decreasing trend over the full time series. Three age-1+ indices, all in North Carolina, and one recruitment index showed an increasing trend over the full time series.

For blueback herring, in the CAN-NNE stock-region, there was one species-level time series, a young-of-year index. ARIMA results indicated it had a very high probability of being above the 2009 index value, and showed an increasing trend in both recent years and over the full time series. In the MNE stock-region, there were five species-level time-series: four run counts and a young-of-year index. ARIMA results indicated that three of the four run counts had a greater than 50% probability of being higher than they were in 2009. None of the time-series showed a significant trend in recent years. The Oyster River run count had a decreasing trend over the full

time series, and only a 16% probability of being above the 2009 value. The young-of-year index also had a significant decreasing trend over the full time series, but had a high probability of being above the 2009 value in the most recent year. There were no species-level time-series for the SNE stock-region (all run counts for this region were reported as mixed river herring). For the MAT stock-region, there were 27 species-level time series: 16 age-1+ surveys and 11 recruitment indices. ARIMA results indicated that seven of sixteen age-1+ indices and nine of the eleven recruitment indices had a greater than 50% probability of being higher than they were in 2009. Only one time series, the NC Albemarle Sound Gillnet Survey of age-1+ abundance had an increasing trend in recent years; the rest were non-significant. Over the full time series, four recruitment indices and two age-1+ indices showed decreasing trends, while one recruitment index and three age-1+ indices showed increasing trends. For the SAT stock region, there were three species-level time series: one run count, one age-1+ survey, and a young-of-year index. ARIMA results indicated that the age-1+ surveys and the young-of-year survey had a greater than 50% probability of being higher than they were in 2009, while the Santee-Cooper River run count had only a 3% probability of being above the 2009 value. The Santee-Cooper River run count showed a decreasing trend over the full time series and in recent years. The young-of-year index showed an increasing trend over the full time series, but the age-1+ index had no significant trend over either time period.

5. **If possible, develop models used to estimate population parameters (e.g., Z, biomass, abundance) and biological reference points, and analyze model performance.**

This assessment updated and refined the trend analyses, total mortality (Z) estimates, and Z reference points from the 2012 benchmark assessment. New analyses included the exploration of a MARSS model in an attempt to identify underlying trends within stock-regions, and the development of a habitat model to understand the importance of habitat loss and restoration on river herring population trends at the watershed level.

Indices of abundance were developed and correlation of the indices within region was measured with Spearman's Rank Correlation. Power analysis was used to calculate the probability of detecting trends in the abundance indices developed from fishery-independent data using the methods of Gerrodette (1987). Indices and run counts were analyzed with the non-parametric Mann-Kendall trend analysis (Mann 1945, Kendall 1975) to determine if a monotonic trend was present in each series. The autoregressive integrated moving average (ARIMA) approach (Box and Jenkins 1976) was used to minimize measurement error in the survey estimates and to infer population status relative to an index-based reference point (25th percentile and fitted 2009 value respectively) for both abundance indices and run counts.

Trends in maximum age, mean age-at-length, mean length, and repeat spawner percentage were tested for by species and sex where the data existed.

A Poisson log-linear model was used to estimate total instantaneous mortality (Z) rates (Millar, 2015) for each species and year combination for two different spatial scales: at the river level and at the regional level. A stochastic spawning stock biomass per recruit model (SPR) was developed to estimate a total mortality threshold of $Z_{40\%SPR}$ for each stock-region to evaluate

the estimates of Z against; the stochastic approach allowed a more comprehensive inclusion of uncertainty for the key life history and fishery parameters in the model.

A Multivariate Auto-Regressive State-Space (MARSS) model was explored for each stock-region which analyzed river-level surveys and run counts in an attempt to identify underlying trends across rivers within each stock-region. However, the overall performance of this model was poor, indicating an inability to isolate a single consistent trend in abundance across rivers within stock-regions.

Statistical catch-at-age (SCA) models developed during the last benchmark were updated and refined for the Monument (alewife), Nanticoke (alewife and blueback herring), and Chowan (blueback herring) rivers.

A habitat model was developed which modeled population abundance of anadromous river herring as a function of freshwater habitat availability throughout their native ranges (habitat model). This model relies on a combination of biological parameters and habitat distribution in freshwater spawning and rearing environments to project populations through time similar to the American shad model (ASMFC 2020).

6. **If possible, develop methods to calculate a biologically-based cap or limit on bycatch of river herring in ocean fisheries.**

The SAS developed a proof-of-concept example for a bycatch cap based on the data-limited index-based methods simulation-tested as part of the 2020 SAW/SARC Research Track "Topics" Assessment, specifically the iSmooth (aka Plan B Smooth) and iSlope approaches (NEFSC 2020). In the simulations, these approaches were able to rebuild stocks above SSB_{MSY} on average in the long term, and also had the highest median catch among the methods that achieved rebuilding more than 50% of the time (NEFSC 2020). The NEFSC and NEAMAP surveys were used as ocean/mixed-stock indices, and an index from run counts from stock-regions identified as significant contributors to bycatch in the midwater trawl fishery by Reid et al. (2022) was used as a sensitivity run (SNE for alewife, MAT for blueback herring).

The estimated catch caps were lower than both the estimated bycatch and the current bycatch cap across species and fisheries. The total cap for all river herring and shad across the mackerel and Atlantic herring fleets was 490 mt per year over the last three years. The estimates of the alewife catch cap for the coast ranged from a high of 85.2mt for the iSmooth approach with the mixed stock index to a low of 34.4mt for the iSlope approach with the run count index (Table 31). Coastwide bycatch of alewife has averaged 91.7 mt over the last three years. The blueback herring catch cap for the coast ranged from a high of 41.4mt for the iSmooth approach with the mixed stock index to a low of 20.9mt for the iSlope approach with the run count index (Table 31). Coastwide bycatch of blueback herring has averaged 42.5 mt over the last three years.

The iSmooth and iSlope approaches utilize available information on river herring abundance to adjust the bycatch caps instead of using a fixed, historical level. This allows the caps to decrease when river herring abundance is decreasing and increase as river herring abundance increases,

making them more responsive to trends in the river herring population. However, there is no mechanistic population model underlying these methods to provide an estimate of what a sustainable level of removals for these populations are. In addition, declines in river herring are only partially driven by ocean bycatch, so reducing incidental catch may not lead to increases in abundance and the TAC would continue to be reduced if the population continued to decline.

Furthermore, the bycatch fishery is operating on the mixed stock population, and the proportion of each run or genetic stock-region that is present in the bycatch is a function of the abundance of each run as well as the time and area where the fishery is operating. The genetic composition of the bycatch is not currently monitored, so even if population-level estimates of bycatch limits could be developed from population models, the current sampling framework could not accurately monitor removals against those caps.

The SAS recommended developing a species-distribution model to determine time-area closures as an alternative or complement to the catch cap approach to reduce river bycatch, which would require less intensive observer sampling to implement. However, the development of that kind of model was beyond the scope of this assessment.

7. Recommend stock status as related to reference points, if available

The coastwide populations of both alewife and blueback herring were still depleted relative to historic levels. The habitat model indicated that overall productivity of all stock-regions for both species is lower than would be expected under virgin habitat conditions. In terms of recent trends, there is no clear signal for either species across the coast. Even within the genetic stock-regions, individual rivers often differed in recent and longer-term trends for both abundance and mortality, with some rivers showing increasing trends and low mortality rates, and others showing flat or declining trends and total mortality rates above the $Z_{40\%SPR}$ reference point.

While the NNE and CAN-NNE stock-regions showed the highest proportion of rivers with positive abundance trends, there were rivers in these stock-regions with high Z rates and/or no sign of increases since 2009. Meanwhile, some rivers in other stock-regions did show positive trends, and the MAT stock-region for both species had the highest proportion of rivers with a low probability of being above the $Z_{40\%SPR}$ reference point. See Table 28 and Table 39 for a river-by-river summary of stock status.

8. Other potential scientific issues

Where available, the SAS compared trends in *Z* estimates to trends in abundance, and found that in most cases, the trends were inversely related, as would be expected if *Z* is affecting abundance. I.e., most rivers with an increasing *Z* trend showed a decreasing abundance trend, and rivers with increasing abundance trends showed a decreasing trend in *Z*. A few rivers showed declines in abundance even though *Z* was stable. However, the majority of rivers with data did not have both a *Z* estimate and an abundance trend.

The habitat model indicated that habitat loss was greatest for the CAN-NNE and NNE stock-regions, but those regions had the highest number of increasing trends along the coast. The northern states have done extensive work to restore access to habitat in multiple stock-regions, but not all rivers have responded. Habitat restoration may be part of the reason the northern stock-regions are showing positive trends, but other factors may be hindering rebuilding in other stock-regions. Reid et al. (2022) noted that bycatch in ocean fisheries is comprised mainly of alewife from the SNE stock-region and blueback herring from the MAT stock-region, areas that have undergone habitat restoration but do not show the same positive trends as the more northern stock-regions.

The literature on the effects of climate change on river herring is not extensive, even less so for blueback herring than for alewife. Alewife and blueback herring have been ranked as "Very High Risk" to climate change by Hare et al. (2016) and as "Vulnerable" by Galbraith and Morelli (2017). This is due to their exposure to multiple factors of climate change impacts and their life history (i.e., temperature-driven spawning runs to their natal freshwater spawning grounds) that make it more difficult for them to adapt to these changes. The direct effects of climate change are difficult to measure. The Gulf of Maine is one of the fastest warming areas in the ocean, but the trends in that region are more positive than in other locations on the coast. Staudinger et al. (2024) found that evidence of changes in the timing (initiation and peak) of spawning runs was mixed, with some populations shifting earlier in recent years, some shifting later, and some not changing. Alewife's center of biomass has been shifting further north in the NEFSC trawl survey. However, without genetic composition data, it is difficult to determine whether the biomass of the total coastwide population is shifting north, or whether the change in the center of biomass is driven by different patterns in abundance trends in northern vs. southern populations of alewife.

9. **If a minority report has been filed, explain majority reasoning against adopting approach suggested in that report. The minority report should explain reasoning against adopting approach suggested by the majority.**

No minority report has been filed.

10. **Develop detailed short and long-term prioritized lists of recommendations for future research, data collection, and assessment methodology**

High priority short-term recommendations for research and data collection included develop consistent ageing protocols across all states; establishing a database of existing data sources with comprehensive metadata and recommendations for use; expand observer and port sampling coverage including genetic sampling to better quantify incidental catch of river herring; studies to quantify, improve, and implement standard practices for fish passage efficiency; and evaluating and validating hydroacoustic methods to quantify river herring spawning run numbers in major river systems. Continued development of the habitat model or similar models to predict the potential impacts of climate change on river herring distribution and stock persistence and develop targets for rivers undergoing restoration (dam removals,

fishways, supplemental stocking, etc.) was a high-priority short term research recommendation for assessment methodology.

High priority long-term recommendations were to conduct regular exchanges or workshops to monitor the precision of ageing across states and maintain or implement river herring-specific surveys, particularly in rivers without run counts or rivers where restoration efforts (e.g., dam removal) will break or end the time series of run counts.

11. Recommend timing of next benchmark assessment and intermediate updates, if necessary relative to biology and current management of the species

The SAS recommends that an assessment update be conducted in five years and a benchmark assessment in ten years. Due to the high variability of fisheries independent surveys, an assessment update at a shorter timeframe will likely not show any significant changes in indices of abundance. New datasets which would warrant a benchmark would require a time-series of at least seven years. If significant improvements to the habitat or other models are achieved before ten years, the benchmark could be accelerated.

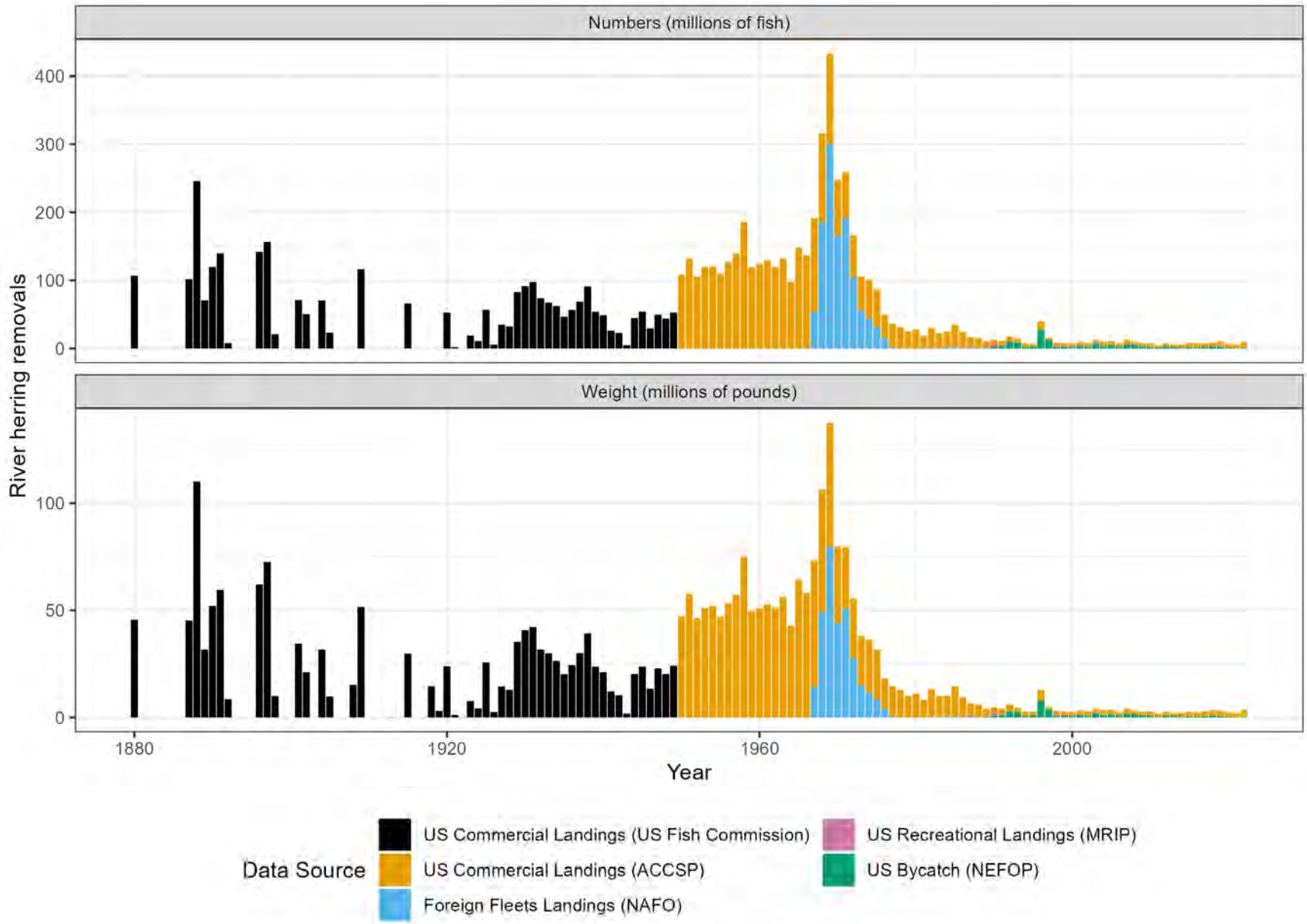


Figure 1. Total removals of river herring by data source, 1880-2022.

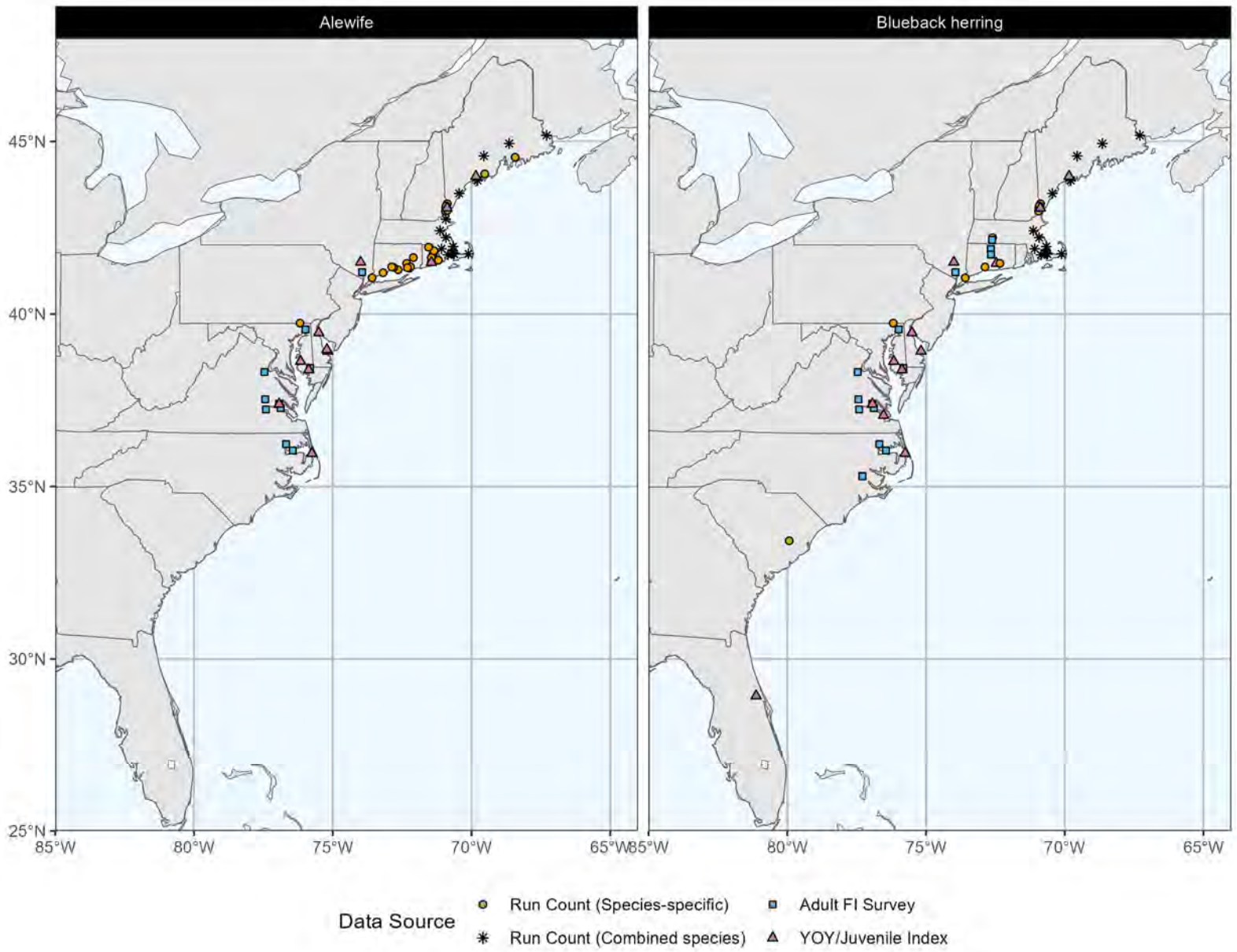


Figure 2. Map of river herring data sources by river and data type.

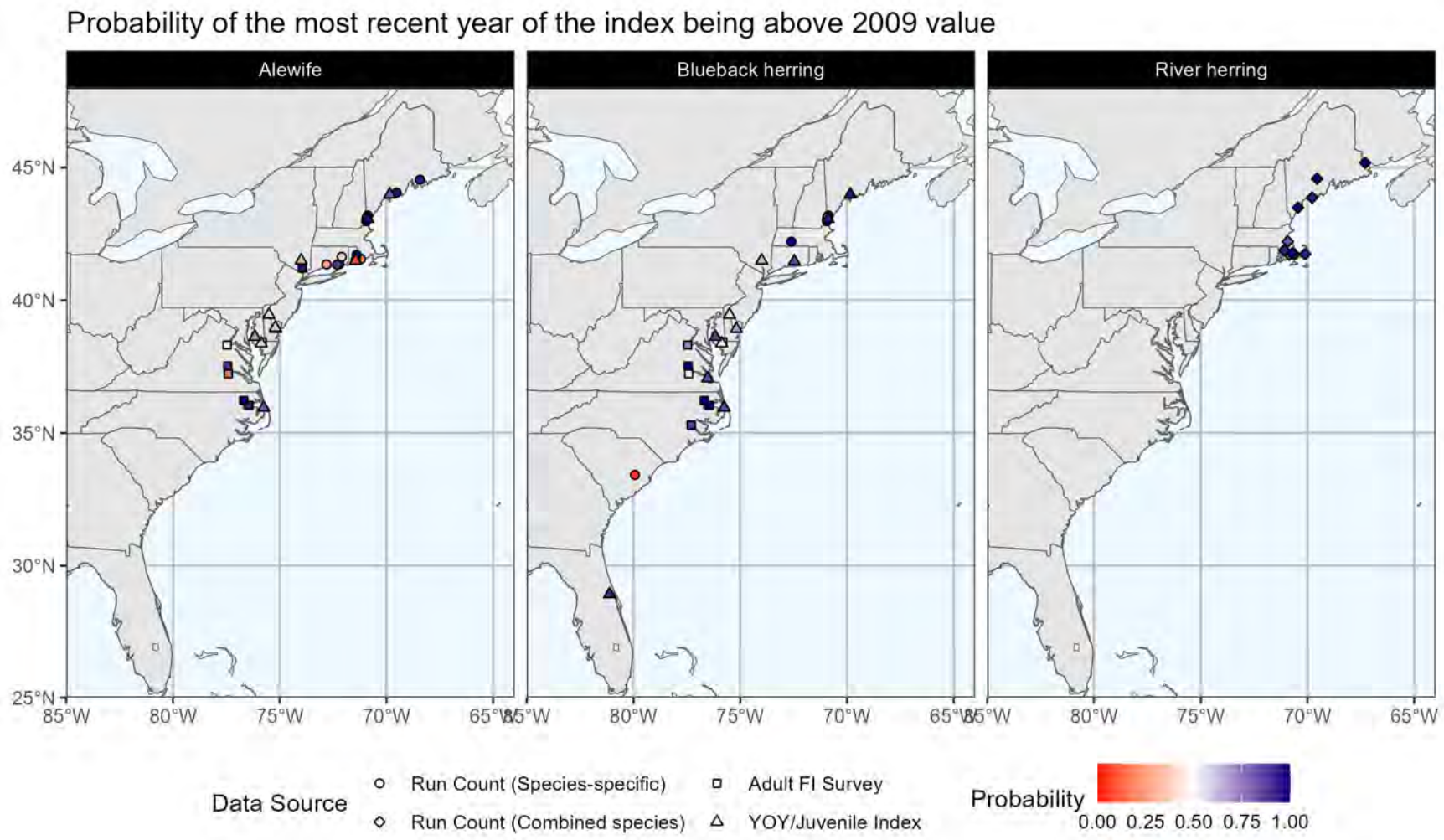


Figure 3. Map of the results of the ARIMA analysis showing the probability that the terminal year of the index is greater than the 2009 value. "River herring" indicates run counts that are not differentiated by species.

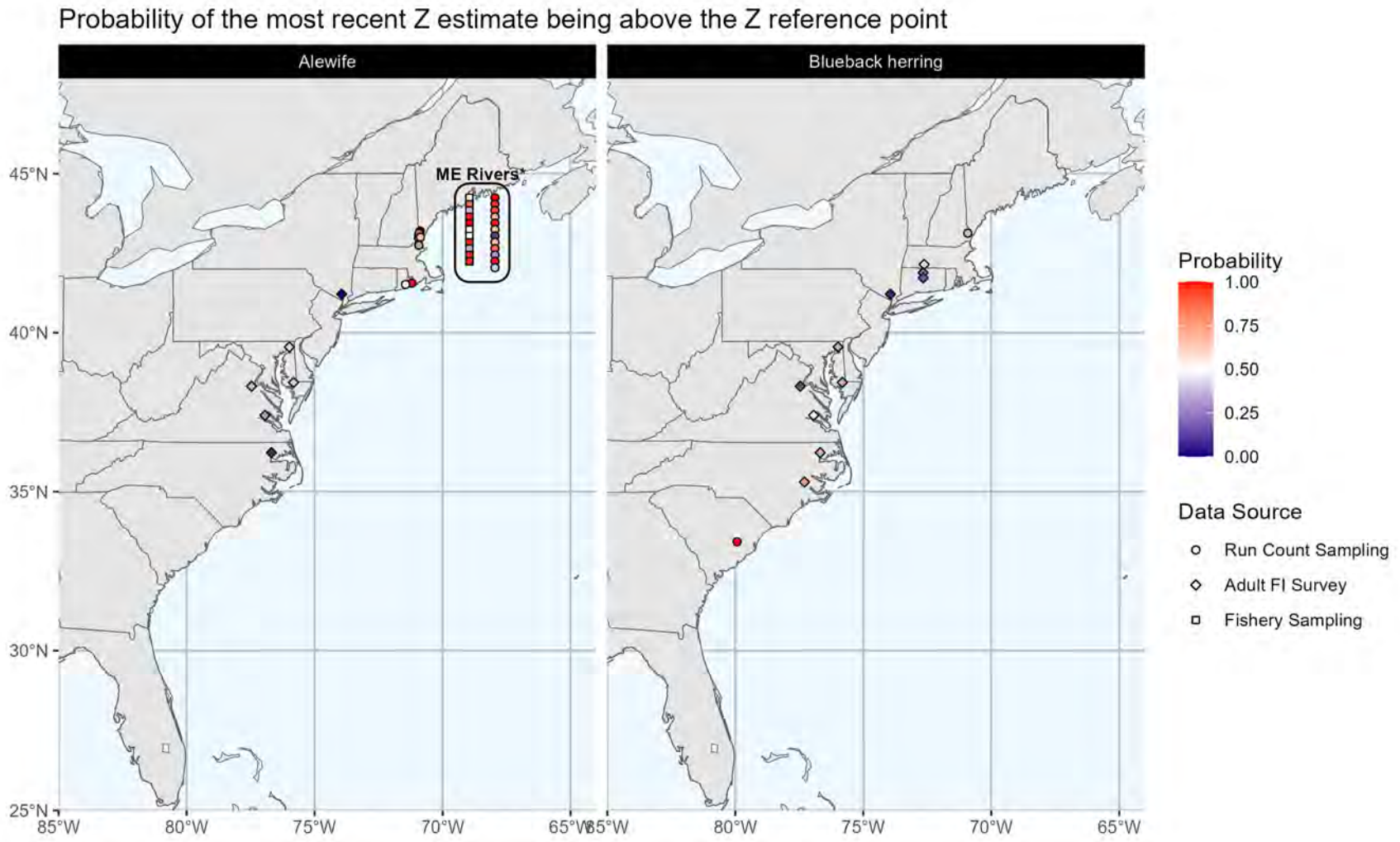


Figure 4. Map of the probability that the most recent Z estimate is above the $Z_{40\%SPR}$ reference point. *ME Rivers: Maine rivers are not plotted geographically to preserve confidentiality.

"Conserving to preserve Maine's heritage."

Jeff Pierce
Director, Alewife Harvesters of Maine

July 15, 2024

Dear Chairwoman Fegley,

This letter is in response to the ongoing ASMFC stock assessment process for river herring.

The Alewife Harvesters of Maine support this process and would like to express our appreciation to the ASMFC and River Herring Stock Assessment Sub-Committee for their commitment to determine current stock status and develop management recommendations. However, we are concerned by what is **not** addressed in this report and would like to request that the ASMFC include and consider (in their assessment of river herring stocks) the current effects of local, harvest centered, stewardship efforts that positively affect river herring populations.

Stock assessments look at population trends, biological data, and consider pressures and stressors on populations that affect populations in either a positive or negative way. We are concerned that while stock assessments do a comprehensive job of looking at traditional fisheries metrics, they miss the mark in looking at the effects of harvester-based stewardship and how incentivizing these practices will benefit river herring populations in Maine and other states.

Through previous river herring assessments and Management Board actions, the ASMFC and TC developed specific recommendations for metrics that should be met for a directed commercial fishery to occur. These metrics apply standard fisheries management practices and techniques to avoid applying too much pressure to one stock.

There is one problem. These metrics follow a traditional assumption that a fishery (and therein, the fisherman) has only one effect on populations, and that is to catch and remove fish from the population. The end results are recommendations on how not to catch too many fish, or how to avoid disproportionately and adversely affecting certain age classes or sub populations that might have a larger significance for a biological or other reason (like protecting more fecund individuals in a population.) What this traditional thinking leaves out is the potential that fishermen and fisheries (in some cases) may have a net positive effect on populations, and if conducted in the right way, is something that should be incentivized and supported rather than curtailed and prevented.

The AHOM recognizes this argument sounds typical of a fishing advocacy organization that just wants to catch more fish. But we are not arguing for any specific new fishery openings and we are not asking for higher harvest levels. We are looking for an analysis of the effects of single stock, single fisherman, freshwater fisheries, conducted by fishermen that are catching fish from the same stock. One where fishing effects (positive or negative), will be felt by the same individual fisherman in the future.

This unique scenario is the tradition in Maine river herring fisheries and we believe that it is one of the most significant reasons why Maine is the last stronghold for river herring populations coastwide. In 2024 Maine had several river herring runs returning more than 1-million fish, with some runs topping 5-million adult returns. There is effective individual and community-based ownership in these fisheries that supports the collection of individual population level data through the harvesters or potential harvesters that are collecting the 10 years of data currently required to open a

"Conserving to preserve Maine's heritage."

fishery. These harvest based stewardship activities give managers data required to effectively manage and restore additional river herring populations.

Harvester-based activities also support downstream passage by keeping migration corridors open to post spawn and juvenile river herring. These effects might not reflect any significant importance in models and forecasts, but that is because they have not been studied in the manner that fishing practices are addressed. There is simply no recognition of post spawn and juvenile emigration success in many of the existing models.

One question to consider is "What effects would there be on future river herring populations if existing local harvest activities were stopped?" The first thing that would happen is that ASMFC would no longer receive fishery biological (fisheries dependent or fisheries independent, in the case of a municipality trying to start a harvest) data associated with individual river herring populations. If harvesting is prohibited, managers lose a significant source of biological data for assessment and management actions. Maine's commercial river herring harvesters don't just count fish and collect scales for aging. Maine's river herring harvesters are knowledgeable professionals that oversee the annual river herring runs during their daily presence at the harvest location and during the critical periods of downstream migration for post spawn adults and juvenile river herring. Harvesters clear debris from streams, including beaver dams that can individually shut off hundreds of thousands (millions in some cases) of fish that are heading to their spawning grounds. These harvesters give tours of streams, river herring runs, and create the outreach and education opportunities that engage future stewards to become involved. This will be the reason these fisheries still exist in 100 years. The list of potential benefits goes on but we sincerely believe these dedicated individuals are important to the continued success the state of Maine is seeing in increasing river herring populations.

To be clear, we are not asking for some kind of blanket opening of all fisheries. Clearly, there is still an important place for safeguards and restrictions to mitigate potential risks of fishing. But without considering benefits of harvest, we believe the ASMFC is missing a large piece of the picture that has made Maine the leader in river herring recovery. It is also clear from losses of other fisheries that institutional knowledge and ownership can be lost in an instant if it is not recognized and used to best manage the fishery.

We ask that, before this stock assessment is approved, that the River Herring & American Shad Management Board make certain that this important part of the picture is included in how we manage river herring fisheries into the future.

Thank you for your time and consideration and please don't hesitate to reach out with any questions.

Sincerely,

Jeff Pierce

PO Box 51 Dresden, ME 04342 □ (207) 441-3006 □ jeffrey@alewifeharvesters.org □ www.alewifeharvesters.org

Atlantic States Marine Fisheries Commission

ISFMP Policy Board

August 8, 2024
8:30 – 10:00 am

Draft Agenda

The times listed are approximate; the order in which these items will be taken is subject to change; other items may be added as necessary.

1.	Welcome/Call to Order *(J. Cimino)*	8:30 a.m.
2.	Board Consent *(J. Cimino)* • Approval of Agenda • Approval of Proceedings from May 2024	8:30 a.m.
3.	Public Comment	8:35 a.m.
4.	Executive Committee Report (*J. Cimino*)	8:45 a.m.
5.	Update on American Eel Convention on International Trade of Endangered Species Activity	8:55a.m.
6.	Discuss H.R. 8705, the *Fisheries Data Modernization and Accuracy Act of 2024* (*R. Beal*) **Possible Action**	9:10 a.m.
7.	Presentation of National Fish and Wildlife Foundation Electronic Monitoring and Reporting (*W. Goldsmith*)	9:25 a.m.
8.	Committee Reports • Habitat Committee (*S. Kaalstad*) **Action** • Atlantic Coast Fisheries Habitat Partnership (*S. Kaalstad*) • Assessment Science Committee (*J. Patel*) **Action**	9:35 a.m.
9.	Review Noncompliance Findings (If Necessary) **Action**	9:50 a.m.
10.	Other Business	9:55 a.m.
11.	Adjourn	10:00 a.m.

The meeting will be held at The Westin Crystal City (1800 Richmond Highway, Arlington, VA; 703.486.1111) and via webinar; click here for details

MEETING OVERVIEW

ISFMP Policy Board
August 8, 2024
8:30 – 10:00 a.m.

Chair: Joe Cimino (NJ) Assumed Chairmanship: 10/23	Vice Chair: Dan McKiernan (MA)	Previous Board Meeting: May 2,2024
Voting Members: ME, NH, MA, RI, CT, NY, NJ, PA, DE, MD, DC, PRFC, VA, NC, SC, GA, FL, NMFS, USFWS (19 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from May 2024

3. Public Comment – At the beginning of the meeting, public comment will be taken on items not on the agenda. Individuals that wish to speak at this time must sign-in at the beginning of the meeting. For agenda items that have already gone out for public hearing and/or have had a public comment period that has closed, the Board Chair may determine that additional public comment will not provide additional information. In this circumstance, the Chair will not allow additional public comment on an issue. For agenda items that the public has not had a chance to provide input, the Board Chair may allow limited opportunity for comment. The Board Chair has the discretion to limit the number of speakers and/or the length of each comment.

4. Executive Committee Report (8:45-8:55 a.m.)

Background

- The Executive Committee will meet on August 7, 2024

Presentations

- J. Cimino will provide an update of the Executive Committee Work

Board actions for consideration at this meeting

- None

5. Update on American Eel Convention on International Trade of Endangered Species Activity (8:55-9:10 a.m.)

Background

- FWS is considering listing eel as an Appendix III in CITES which would mean any eel or eel product export would need a certification that the product/eel was legally caught and legally purchased before leaving the country. An appendix III listing is an option a country can choose to do, it is not required by CITES. Trade in an Appendix III species is regulated using CITES export permits (which would be issued by the USFWS) and certificates of origin (issued by all other countries).

- The Commission, with the Association of Fish and Wildlife, sent a letter to the USFWS expressing concerns regarding the potential listing of American Eel in CITES Appendix III (**Meeting Materials**)

Presentations

- Update on American Eel Convention on International Trade of Endangered Species Activity

Board actions for consideration at this meeting

- None

6. Discuss H.R. 8705, the *Fisheries Data Modernization and Accuracy Act of 2024* (9:10-9:25 a.m.) Possible Action

Background

- The H.R. 8705, the Fisheries Data Modernization and Accuracy Act of 2024 (**Meeting Materials**), introduced by Representative Graves of Louisiana, has had one legislative hearing in front of the House Committee on Natural Resources. In this hearing members generally discussed the purpose of the bill and their support for or against it. The next step in the process is a bill markup in the House Committee on Natural Resources. Here they will discuss the finer points of the bill and consider amendments to it. Rep. Graves is waiting on NMFS's technical analysis of the bill before they request it to be marked up. Depending on NOAA's timing this could be anytime after the beginning of September.

Presentations

- Staff will provide an overview of H.R. 8705 and

Board actions for consideration at this meeting

- Provide feedback on issues the Commission supports/does not support within the bill

7. Presentation of National Fish and Wildlife Foundation Electronic Monitoring and Reporting (9:25-9:35 a.m.)

Background

- The National Fish and Wildlife Foundation will award up to $4.8 million in grants that catalyze the voluntary implementation of electronic technologies for fisheries catch, effort, and/or compliance monitoring, and improvements to fishery information systems in U.S. fisheries. The Program will advance NOAA's sustainable fisheries goals to partner with fishermen and other stakeholders, state agencies, and Fishery Information Networks to systematically integrate technology into fisheries data collection and observations as well as streamline data management and use for fisheries management.
- An RFP has been released and proposals are due by October 2, 2024

Presentations

- W. Goldsmith will provide and overview of the program as it pertains to Commission species. (**Meeting Materials**)

Board actions for consideration at this meeting

- None

8. Committee Updates (11:35-11:40 a.m.) Action

Background

- The Habitat Committee met on July 22, 2024 to finalize the Habitat Management Series (HMS): *Anthropogenic Noise Impacts on Atlantic Fish and Fisheries: Implications for Managers and Long-Term Productivity* (**meeting materials**) and discuss the next HMS topic as well as topics for the 2024 Habitat Hotline
- The ACFHP met in May of 2024 to discuss FY 24 and 25 fish habitat restoration projects, completed ACFHP supported projects and the application for Congressional Designation to NFHP Board
- The Assessment Science Committee met to update the Commission's stock assessment schedule

Presentations

- S. Kaalstad will present on actives of the Habitat Committee, including a presentation on the latest HMS: *Anthropogenic Noise Impacts on Atlantic Fish and Fisheries: Implications for Managers and Long-Term Productivity*, as well as the actives of the ACFHP
- J.Patel will present an updated Commission stock assessment scheduled

Board actions for consideration at this meeting

- Consider the approval of the HMS: *Anthropogenic Noise Impacts on Atlantic Fish and Fisheries: Implications for Managers and Long-Term Productivity*
- Consider the updated Commission stock assessment schedule

9. Review Non-Compliance, If Necessary Action

10. Other Business/Adjourn (10:00 a.m.)

DRAFT PROCEEDINGS OF THE

ATLANTIC STATES MARINE FISHERIES COMMISSION

ISFMP POLICY BOARD

The Westin Crystal City
Arlington, Virginia
Hybrid Meeting

May 2, 2024

TABLE OF CONTENTS

INDEX OF MOTIONS

ATTENDANCE

Board Members

Pat Keliher, ME (AA)
Cheri Patterson, NH (AA)
Dennis Abbott, NH proxy for Sen. Watters (LA)
Doug Grout, NH (GA)
Dan McKiernan, MA (AA)
Jason McNamee, RI (AA)
Eric Reid, RI, proxy for Sen. Sosnowski (RI)
Justin Davis, CT (AA)
William Hyatt, CT (GA)
Marty Gary, NY (AA)
Scott Curatolo-Wagemann, NY, proxy for E. Hasbrouck (GA)
Amy Karlnosky, NY, proxy for Sen. Gopal (LA)
Joe Cimino, NJ (AA)
Jeff Kaelin, NJ (GA)
Adam Nowalsky, NJ, proxy for Sen. Gopal (LA)
Kris Kuhn, PA, proxy for T. Schaeffer (AA)
Loren Lustig, PA (GA)
John Clark, DE (AA)
Roy Miller, DE (GA)
Lynn Fegley, MD (AA, Acting)
Shanna Madsen VA, proxy for J. Green (AA)
Chris Batsavage, NC, proxy for K. Rawls (AA)
Ben Dyar, SC, proxy for Blaik Keppler (AA)
Chris McDonough, SC, proxy for Sen. Cromer (LA)
Doug Haymans, GA (AA)
Jeff Renchen, FL, proxy for J. McCawley (AA)
Gary Jennings, FL (GA)
Ron Owens, PRFC
Mike Ruccio, NOAA

(AA = Administrative Appointee; GA = Governor Appointee; LA = Legislative Appointee)

Staff

Bob Beal
Toni Kerns
Tina Berger
Alexander Law
Madeline Musante
Chelsea Tuohy
Caitlin Starks
Emily Franke
James Boyle
Tracey Bauer
Katie Drew
Kristen Anstead
Jeff Kipp
Pat Campfield
Kurt Blanchard

Guests

Max Appelman, NOAA
Mike Armstrong, MA DMF
Alan Bianchi, NC DMF
Tom Bleifuss, USCG
Jason Boucher, NOAA
Robert Boyles
Jeffrey Brust, NJ DFW
Michael Celestino, NJ DFW
Richard Cody, NOAA
Brain Collins
Jennifer Couture, NEFMC
Jessica Daher, NJ DEP
Chris Dollar, Coastal Cons. Assn.
Mitchell Eigabaum
Julie Evans, East Hampton Town Fisheries Advisory Cmte.
James Fletcher, Unites National Fisherman's Assn.
Anthony Friedrich, ASGA
Sarah Gaichas, NOAA
Alexa Galvan, VMRC
Keilin Gamboa-Salazar, SC DNR
Matthew Gates
Pat Geer, VMRC
Lewis Gillingham, VMRC
Jamie Green, SC DNR
Melanie Griffin, MA DMF
Hannah Hart, MAFMC
Jesse Hornstein, NYS DEC
Todd Janeski, VCU
Robert LaCava, MD DNR
Laura Lee, US FWS
Tom Lilly, Menhaden Project
John Maniscalco, NYS DEC
Tara McClintock, Cornell University Cooperative Extension
Kevin McMenamin, Annapolis Anglers Club
Meredith Mendelson, ME DMR
Alex Mercado, Cornell Cooperative Extension of Suffolk County
Nichola Meserve, RI DEM
Steve Meyers
Brandon Muffley, MAFMC
Ed Mullis, B&C Seafood Inc.
Allison Murphy, NOAA
Thomas Newman, North Carolina Fisheries Assn.

Guests (Continued)

Jay Odell, Monmouth University Urban Coast Institute
Anna Quintrell, NOAA
Jill Ramsey, VMRC
Sefatia Romeo Theken, MA DFG
Daniel Salerno, NEFMC
Tara Scott, NMFS
McLean Seward, NC DEQ
Amanda Small, MD DNR
Somers Smott, VMRC
Renee St. Amand, CT DEEP
Kristen Thiebault, MA DMF
Chad Thomas, NC Marine & Estuary Foundation
Mike Waine, ASA
Kelly Whitmore, MA DMF
Angel Willey, MD DNR
Travis Williams, NC DEQ
Chris Wright, NOAA
Daniel Zapf, NC DEQ
Renee Zobel, NH FGD

The Interstate Fisheries Management Program Policy Board of the Atlantic States Marine Fisheries Commission convened in the Jefferson Ballroom of the Westin Crystal City Hotel, Arlington, Virginia, via hybrid meeting, in-person and webinar; Thursday, May 2, 2024, and was called to order at 10:00 a.m. by Chair Joe Cimino.

CALL TO ORDER

CHAIR JOE CIMINO: Good morning, everyone, my name is Joe Cimino; I'm the Administrative Commissioner for New Jersey, Chair of the ASMFC. I'm going to call to order the Interstate Fisheries Management Plan Program Policy Board, and begin the wrap up of our meeting this spring.

APPROVAL OF AGENDA

CHAIR CIMINO: We're going to go for Board Consent on Approval of the Agenda. Are there any changes or additions to the agenda? Seeing none.

APPROVAL OF PROCEEDINGS

CHAIR CIMINO: Also, Approval of the Proceedings from our January meeting. We have a motion from Pat to approve, second. We'll consider that approved by consent.

PUBLIC COMMENT

CHAIR CIMINO: Any Public Comment for items not on the agenda? It looks like we have one. It looks like we have two, so go ahead and we'll give two minutes. Sorry, please introduce yourself.

MR. MITCHELL FEIGENBAUM: Yes, my name is Mitchell Feigenbaum; I'm the Chairman of the Advisory Panel for American eel. I'm a former Commissioner in the role of the Proxy for the Pennsylvania Legislative Rep. I've been a member of the AP for approximately 18 years, and I've devoted my entire adult professional life for the last 25 years to the American eel business industry and regulatory management in both Canada and the U.S.

It's very difficult to restrain my comments to two minutes. I refrained from making public comments during earlier meetings, as well as at the Executive Committee, and was hoping to engage in maybe ten minutes of discussion about a very vital matter, but I'll do my best and we'll see where it goes.

I shared these comments with the Law Enforcement Committee yesterday, and I also shared some thoughts in a little bit more elaborate form in some comments that were added to the supplementary materials to the American eel package that was sent out to all Board members. There is a serious problem in the Canadian glass eel fishery, it is spilling into the U.S., and it will only increase in coming years, unless the ASMFC plays its part in helping to address them.

Canada has become the hub for the illegal unregulated and unreported trafficking of baby eels. The situation is described in the Shiraishi and Kaifu report included in the meeting materials, which Commissioner Miller referred to yesterday. That report states that Hong Kong imported 150 tons of glass eels from the Americas in 2022, 100 tons from Haiti, 42 tons from Canada, 13 tons from the U.S. With certainty, I can assure the Commission that those numbers are grossly exaggerated. Still, they reflect a terrible reality. Criminal organizations involving glass eel smuggling are creating false records and engaging in fraudulent tactics to hide and mislabel a vast number of lookalike eel species, that Hong Kong and Chinese importers bring from all over the world.

False documents changed the apparent origin of illegal eels to make them appear legal. False practices enable criminals to increase the value of cheap eels from places like Indonesia, Africa and the Philippines, by recasting them as highly valued American eel. Organized criminals behind the problem include and are dominated by powerful Chinese interests, Haitian gangs, and native leaders in Canada that do not recognize that country's right to regulate their activities.

CHAIR CIMINO: Mitchell, if you will. I appreciate you being here, and representing the AP for eel. Personally, I just want to say that I agree that this is important. But having you rush through this is probably not the best way to get this information to

us, since you are an Advisor, I would encourage you to send information to staff.

MR. FEIGENBAUM: If I may respond, I have sent the information, and I would appeal to the Chairman and the Commission to indulge me for another two or three minutes at least, to frame the issue, and why I feel it is a matter of ISFMP Policy. While I don't expect the Commission to take up the substance of my requests, suggestions and current concerns today, I would like to get them out on the record, and I can certainly do so in another three minutes.

CHAIR CIMINO: Adam.

MR. ADAM NOWALSKY: I would kindly request, Mr. Chairman that you see what other participants of the public want to comment, and if they are limited or not, I would request that we defer time from the time that is already on the agenda to hear Mr. Feigenbaum out for a couple more minutes.

CHAIR CIMINO: Pat.

MR. PATRICK C. KELIHER: I was not going to speak about additional time, but I was going to ask for this to be added under Other Business, because I've been very engaged with Canada on this particular issue, and I have something to add to the Board, and potentially a request for a letter to do it.

CHAIR CIMINO: Mitch, we're going to make time because of that, and I apologize. I'm going to give you the option to let us take this up in Other Business, if that is all right with you.

MR. FEIGENBAUM: No apology is necessary. I appreciate the attention and the ability to speak at the appropriate time, and I would be happy to defer my comments until that section of the meeting.

CHAIR CIMINO: We'll do that, thank you. I believe we have two others.

MS. TONI KERNS: Jim Fletcher, and Jim, you just need to unmute yourself.

MR. JAMES FLETCHER: James Fletcher, United National Fishermen's Association. I have a question. With the sturgeon being managed the way they are, and the dogfish being managed the way they are, it looks like we're going to be landing smaller fish, and that is going to require the building of processing equipment. My question is, does ASMFC or anywhere in the system, other than Sea Grant, have funds available to develop equipment to handle small dogfish? Is there any money in ASMFC to develop equipment, any grants? Sea Grant is not an option.

MS. KERNS: Jim, there is not any funding for changes in processing by the Commission at this time. I think the Dogfish Board can ask for implications to the changes in the Dogfish Fishery, relative to the needed changes for protections to Atlantic sturgeon though, as a part of the draft Addendum document. Next on the list was Tom Lilly, if that is helpful.

CHAIR CIMINO: Go ahead, Tom, you have two minutes.

MR. TOM LILLY: Tom Lilly from Whitehaven, Maryland. Fishermen, Charter Captains and 22 conservation groups like Audubon, Sierra Club, Interfaith Partners of the Chesapeake, and the Lutheran Congregations, have joined together in a resolution, asking you to end the factory fishing in Virginia.

These groups represent the values of more than 500 thousand people across Chesapeake Bay. The poor condition of the Bay wildlife is damaging their quality of life and that of their children and my grandchildren. Are you going to take action now to consider what they want? Your charter requires a fish management plan to reflect the values of the interested groups.

There are two peer reviewed scientific articles concerning Virginia Ospreys that are dying off due to menhaden overharvesting. In the study area in Virginia, 150 of 167 nests failed completely. This means that all of the babied in 150 nests starved to death, most during the first week of life.

There is a saying in law and ethics; "Res Ipsa Loquitur, the thing speaks for itself." It speaks for action now. Board members, isn't that what you have here, right in front of you here? This Board can take action right now by asking on this problem right now, by asking the staff and relevant committees to meet with the sponsors of the resolution and other interested groups in the next month, to move forward with management options to solve this problem. Will you do that? Res Ipsa Loquitur.

CHAIR CIMINO: We have one other, go ahead, please introduce yourself.

MR. BRIAN COLLINS: My name is Brian Collins; I'm a concerned citizen from Alexandria, Virginia, and I just wanted to make a couple comments. I'm part of a Citizen Public Community dialogue, and I wanted to share with you the concern that ASMFC is losing credibility with the sportfishing community and the public, and here is why. It appears you are not acknowledging the Chesapeake Bay as a separate ecosystem from the ocean. You manage menhaden as a single stock. You don't have any shared scientific data to support your Bay menhaden quotas. Your ocean and Bay quotas overlap. At the mouth of the Bay, you allow another 230 million pounds to be taken, in addition to 112. Those aren't acknowledged, but we know the fish come in and out of the Bay, that is the problem. Your striped bass regulations do not acknowledge the fact that the Chesapeake Bay is a nursery for the majority of the east coast striped bass stock. Striped bass live in the Bay nine years before heading to the ocean when they're 32 inches long.

That is a captive audience that we need to feed, and it doesn't appear that that is incorporated in any of your science. All the blame is put on sport fishing. Osprey nest thing is failing in higher salinity areas, and nobody believes that historical catch of menhaden is a reasonable metric for validating a quota of 112 million pounds in the Bay. That is like a federal agency getting their funding every year to spend it all to validate it.

We have some members of your community that are saying we have data that documents how many menhaden we have in the Bay, and how many we need. But none of that data is shared with the public. It appears there is no common sense being used in your quota management, and all appearances are from the public, because of the things I've said. It appears that you are beholden to special interest, and I appreciate your time to offer public comment. Thank you.

CHAIR CIMINO: Thank you for your time, appreciate that. I know there has been considerable discussions and frustrations with menhaden management, and we are, I hope getting the message across that we are listening and doing our best to explain how our multispecies approach is working, and we will continue to do that. I'm going to move on. Next item is from me.

EXECUTIVE COMMITTEE REPORT

CHAIR CIMINO: The report on the Executive Committee; we've got two major items. One being the fiscal year budget, well I think both major items are something that we are just extremely fortunate as a Commission to have, incredible staff that have been running things very smoothly, and no surprise. In Laura's sector, we went through the fiscal year '25 budget.

I don't know if there are any particular comments from Executive Committee members on the budget, but we're in a situation where even with a couple of law suits that the Commission is either dealing with directly, or more tangentially, there is money available to deal with that, and other issues that have popped up.

We had a motion to accept the fiscal year budget from our AOC out to the Executive Committee, and that passed unanimously. We went through a legislative update with Alexander, and I think most of you are pretty familiar with where we are there. We went through the future annual meeting update.

I will just give you the preface, which is that we will be meeting in Annapolis this October, I believe. Yes, this October, and so that is pretty exciting, with folks from Mid-Atlantic Fishery Management Council are

familiar with the location, it's a very nice spot. Lastly, we went through the Executive Director's performance review, and well, once again we left Bob off.

No, we're just extremely appreciative of Bob's leadership, his direction here when he needs to step in and get us untangled. It's just incredible performance of everyone on staff that we are somewhat attributing to Bob. I'll leave it at that. Next up is the 2024 State of the Ecosystem Report, sorry, go ahead, Pat.

MR. KELIHER: I'm sorry, Mr. Chairman, but within your chairman's report, one of the things we also considered were our priorities out of the legislative and appropriations priorities. Upon conversations yesterday, and then listening to the Spiny Dogfish conversation as it pertained to sturgeon. It highlighted the fact that to me, that we also missed an area within our priorities, which were species recovery grants under Section 6. It is not listed as one of our priorities.

Bill Hyatt, our Legislative Committee Chair sent out an e-mail to the Legislative Committee this morning saying we should revisit that. Since we're all here, I would urge that we add that as a priority. It has certainly been a priority for the state of Maine. It's been zeroed out, along with many other items within the President's budget, but it's going to be key for all of the states in the northeast and mid-Atlantic, as we continue to work on sturgeon related issues. I thought I would pass that along for consideration.

CHAIR CIMINO: Yes, that is great. Thank you, Pat. I'm going to open it up then to the Policy Board, any comments on what Pat, and I guess Bill have brought up. Any further thoughts on that? If not, is there any objection to adding that as a priority? I don't see any objections, thank you, Pat, and thank you, Bill, I appreciate that.

2024 STATE OF THE ECOSYSTEM REPORT

CHAIR CIMINO: The 2024 State of the Ecosystem Report is something that, well, the state of the ecosystem report is something that some Commission members may not be familiar with. But folks from the New England and Mid-Atlantic Fishery Management Councils are. It's something that plays into our important reviews for MSA actions for our risk policies, socioeconomic stuff in general, climate change stuff in general. I think especially in the climate scenario planning context, I would hope that Board members would take into account this just tremendous report that we get every year.

It has been added to over the years, it has been honed. Sarah will go through all the contributors and the amount of work that has gone into this. I'll just add that for a lot of us, it's one of the favorite presentations we get within a year, and Sarah is kind of our T. Swift, to be honest with you. I'm going to introduce Sarah Gaichas, and let her go through the State of the Ecosystem Report. Go ahead, Sarah, when you're ready.

DR. SARAH GAICHAS: I'll confirm that you can hear me and you can see my screen.

MS. KERNS: Hold on, Sarah. I made you the presenter on my computer, but it doesn't carry over to the main, we can hear you.

CHAIR CIMINO: Yes, we can hear you fine. Toni said, we have it on either the webinar, at least hers, but not yet in the room, Sarah, so give us a second.

MS. KERNS: We are good now.

DR. GAICHAS: Great, all right, well I will roll on. Well, first of all thank you very much for taking this report. What I'm going to give you is a very abbreviated version of what either the Mid-Atlantic or the New England Councils would get. But I welcome any questions or feedback that the Commission has on this report, and we would love to make it more useful to you as well, to the extent that we can. First, I'll acknowledge the other main contributors here though. Caracappa is the editor of the New England Report.

I am the editor of the Mid-Atlantic Report, and then we have a long list of people who have been working on the data in the sections here. The contributors to

the SOE are a slide with at least 80 names on it at the end of this, so I'll get to that soon. Please jump in if something goes wrong with audio, or I say something that doesn't make sense. I welcome that. Just on background on the State of the Ecosystem, or you'll see the acronym SOE.

The idea on this report, for those who aren't familiar, is to improve the ecosystem information and synthesis that we can get into the fishery management system. The idea here is we are showing ecosystem indicators that are linked to the management objectives, very general management objectives. This is contextual information.

The Councils do not take direct action based on this report, but it is intended to provide context for other actions. We've been producing the report since 2016, and evolving it with our management partners, and it is intended to be a fishery relevant subset of what might be a full ecosystem status report.

We don't try to cram everything into this, but just keep it focused on fishery management objectives. We have an open science emphasis. The data, the methods, everything is available to anyone who would like to use them. This report is used within the Mid-Atlantic Fishery Management Council's Ecosystem Process. There are several papers there that you can see.

It basically feeds into the Risk Assessment, and then the Risk Assessment feeds into conceptual modeling and management strategy evaluation at the Mid. Just to give you an idea of the structure of the reports, and some minor changes we've made for 2024. We began the report with summary pages, and that is mostly what I'm going to go over today, just to give you a brief overview.

There is a graphical summary, Page 1 is always a report card relative to management objectives, and the table on the right-hand side there are the objectives that we're looking at. These are broadscale management objectives pulled from national legislation, and guidance on implementing that legislation.

It's things like the definition of optimum yield for federal fisheries is maximizing benefits to the nation, in terms of food production and recreational opportunities. You'll see seafood production and recreation on there. Obviously, we're also trying to have economically viable fisheries, stable fisheries. We have social and cultural objectives and protected species objectives.

In order to have those things happen from the ecosystem, there are some supporting and regulating ecosystem services that are necessary, so we also look at things like biomass, productivity, trophic structure, and habitat as objectives. There is a list of the types of indicators that we report that are aligned with each of those objectives there. Page 1 of the Mid-Atlantic Report and Pages 1 and 2 of the New England Report are these report cards. The next page is summary bullets of risks to meeting management objectives, and then Page 3 is new for this year.

It's Page 4 in the New England Report, is a snapshot of 2023, some conditions that we noted and wanted to bring to managers, so that everyone would know about them, in as close to real time as possible. Then Section 2 of the report is going into detail on the performance relative to management objectives, and Section 3 is going into detail on the risks to meeting those objectives.

This year we have updated the climate and ecosystem risk section, in order to better align it with some of the types of decisions that you make. We also highlight risks that come from offshore wind development. I won't have time to go over those today, but it's not to say there would be no benefits from offshore wind development, but again, these reports are focused on fishery management and what the risks might be from that use of the oceans.

That is the structure. We have some themes for synthesis, so we're trying very hard not to just make this a list of indicators. What we would like is to be able to integrate them and really synthesize what the main messages might be, in terms of management implications. There are three ways that we characterize ecosystem change.

The first is that there are multiple system drivers. There are social, biological, physical, and chemical factors that can drive what we see in marine ecosystems. There are a lot of different pathways. What we try to do, obviously we don't have all the answers, but what we try to do is disentangle some of those pathways, to the extent that we can when we see a change.

I'll show you an example of that. The changes in those drivers can lead to regime shifts, and this we define as a large, abrupt, and persistent change in the structure and function of the ecosystem. I'm currently in a workshop for the next two days, where we're hoping to get more clarity on what we mean by all of these words, and some scientific consensus.

Right now, the reports don't emphasize this too much. But in the future, we would really like to be able to tell you if we've seen one of these large and abrupt changes across many different things in the ecosystem. Regime shifts and changes in the drivers could result in ecosystem reorganization, as everything in the system is responding to new environments.

That is the picture you're seeing there on the bottom right-hand side. It's not to say that different regimes are better or worse, they are just different, and so we need to understand how they work, in order for management to be effective within that regime or reorganized ecosystem, if that happens. Like I said, right now we mostly emphasize multiple system drivers, but we're moving towards being able to understand whether there has been a regime shift or not, and whether that has resulted in new organization for you to consider in management.

Brief words on the scale and figure. You've gotten both reports from Mid-Atlantic and New England. The Mid-Atlantic state of the ecosystem report covers generally indicators for the Mid-Atlantic Bight there in light blue in the map, and the New England report covers indicators for both the Gulf of Maine and Georges Bank in the darker blue colors on the map. But there are some indicators that are coastwide, and I'll show you a couple examples of those today. Everything in red here in these slides is a link to an online supplement, so there is a glossary of terms, technical methods, the data itself, and a catalogue going into detailed indicators.

They are all available online, and we welcome feedback on any of that information to make it more useful to you. So that you can understand the standardized figures to the report, this is kind of a key, and what we're using here is one of our indicators on changes in a long shelf distance and depth of all of the species together on the Northeast Fisheries Science Center Trawl Survey.

Our time series figures will have time on the X axis, obviously, and they'll have whatever the indicator is listed on the Y axis, and then the black dots are the observations, the lines can connect them, and if you see an orange line that means there is a significant increase in the indicator. If you see a purple line that means there is a significant decrease in the indicator.

The gray shading in the end is showing you the most recent ten years, just so you can orient to what the most recent years have been doing relative to the whole time series, and the dash line is the time series average. Just so you know, like now are we above or below the time series average. We only assess trends for 30 plus years right now, but that may change next year.

If you don't see a line, either the time series is less than 30 years, or there is no significant trend. That is a little orientation there. I'm just going to go through the results of al of the reports right now, and then I'll walk you through a couple of examples. Obviously, we won't go through everything.

But for the Mid-Atlantic the performance relative to management objectives is listed on the first page, and you're not going to be able to read this, I'm just going to walk you through what it says. We do trend, status and implications on the first page. Both seafood production and profits are showing long term declining trends in the Mid-Atlantic, and both are below the long-term average right now.

Recreational opportunities are kind of a mixed bag, so effort is up and above long-term average, but

effort diversity, in terms of number of different kind of sectors of the recreational fleet is actually declining significantly and below the long-term average. Our stability indicators are fairly mixed and mostly showing stability in both the fisheries and the ecological side.

We have social and cultural indicators that are not trend indicators, but just status. Those look at fishing engagement and reliance by fishing communities, and environmental justice vulnerability by community. The engagement and reliance characterize the fishing community, but the environmental justice vulnerability characterizes the entire municipality of that community.

That helps people understanding if the major fishing communities are facing challenges, in terms of just community structure that might be affected by, say climate change or regulatory change. Then for protected species objectives, we have two of them that we highlight, maintaining bycatch below thresholds. Those objectives are currently being met for harbor porpoise and gray seals, although the trends in bycatch are mixed between those two, and recovering endangered populations. The Mid-Atlantic and across all the systems, that is NARW is North Atlantic Right Whale, and as I think everyone knows that population has a declining trend right now and is still well below its recovery target. That is where we're at with protected species. Now I'll go through, we have the same page for New England, but we split them into two, because we emphasized Georges Bank indicators and Gulf of Maine indicators separately.

What you see is slightly different story on Georges Bank. Seafood production is basically total production does not have a trend, but the species managed by New England Council are declining, and both are below the long-term average. Similarly, profits do not have a trend, but they are currently above the long-term average on Georges Bank.

Recreational opportunities are not showing trends, either in effort or effort diversity, and are just about around the long-term average for stability. This also is similar to the Mid-Atlantic in that the trends are kind of mixed, but commercial fisheries, stability as the diversity indicator is actually down on Georges Bank, whereas the recreational and ecological indicators are all kind of mixed in there with the long-term average indicating relative stability.

Same indicators but for New England, for social and cultural, and protected species have basically the same as in the Mid-Atlantic, except gray seal can be looked at here. That species is actually above the long-term average and increasing. Similarly in the Gulf of Maine, I've grayed out the ones that are identical between Gulf of Maine and Georges Bank.

But in Gulf of Maine, seafood production is again different, so long term declining trend and below the long-term average, more similar to the Mid, and profits are above the long-term average for total, but declining and below long-term average for New England managed species. The additional endangered species. here in the Gulf of Maine is salmon, and that is showing a downward trajectory and below long-term average.

When we start to look at risks to meeting fishery management objectives, that kind of combines those for both reports on this slide, and I'll go through one of these in detail for you. But right now, the way we've organized these is to talk about risks to spatial management, to seasonal management and to quota setting and rebuilding. What are those risks, that climate is posing to those? In summary, what we're seeing are definitely shifts in fish and protected species distributions. I'll show you those.

We're also seeing change in spawning and migration priming, which might have implications for any regulations that are trying to align seasons with when fish are available, or when they are spawning or not spawning. Also, we are seeing multiple stocks with poor conditioning and declining in productivity.

For other ocean uses, we focus on offshore wind development, and what we list in the report is current revenue in the proposed lease areas. That could be up to 23 percent by Mid-Atlantic ports, and 34 percent by New England ports, and some of these ports do have environmental justice concerns that

may make them have a harder time adjusting to change. For the species themselves it is up to 20 percent of revenue by Mid-Atlantic managed species and up to 54 percent by New England managed species. There are overlaps of offshore wind areas with important right whale foraging habitats, which potentially increases vessel strike and noise risks. In the Gulf of Maine there is an integrated ecosystem assessment in progress, that is looking at Gulf of Maine fisheries and offshore wind. That could be some information that would be useful to you all in the future.

This is our highlights of 2023. This is a new summary page this year, and we welcome feedback on this if you think this type of thing is useful. It's the first time we've done it. The notable events in 2023 include construction actually starting on some of these wind projects. In South Fork and Vinyard Wind 1 started construction.

There was a scallop die-off in the Elephant Trunk between 2022 and 2023. We were noting hypoxia and mortality events in New Jersey coastal waters over the summer in 2023. However, there was record low hypoxia in Chesapeake Bay. It shows that these conditions really can change spatially.

We had a summer phytoplankton bloom that was just off the scale in the Gulf of Maine, and the Gulf of Maine had the second ranked bottom temperature heat wave that we've noted over the time series that we've got. There was warm water everywhere in the northwest Atlantic, except in spring on the northeast U.S. shelf.

Again, these conditions can really vary here locally. We're seeing a lot of changes in the Gulf Stream that alter the shelf break habitats that could be really important to some of the squid fisheries and other fisheries out on the edge. This was an El Nino year in 2023, it was the warmest year on record globally, and again is there because we do report quite often that we just had the warmest year on record globally. That is a trend that continues.

I'm just going to take the remaining time here and walk you through a couple of more in depth examples. The Councils would get the full report, but we'll spare you that today. I'm going to walk you through what the seafood production objective looks like, in terms of the indicators for both the Mid-Atlantic and New England.

The indicators we have for seafood production, which is again declining and below the long-term average, are commercial landings over on the left-hand side of the screen, and recreational harvest on the right-hand side. You can see those purple lines for significant decrease in trends for several of our indicators.

The question is, what is driving this? What we try to do in the report is go through and look at things like ecosystem and stock production, management actions, stock status, market conditions, environmental change, et cetera, to try to sort out what may be driving this. In the Mid-Atlantic the first thing we look at is stock status, and that is the plot on the left-hand side.

I think you can see most of the Mid-Atlantic stocks are in pretty good shape. They've got good status, there are a couple that are below the biomass limit. There is one below the biomass limit, a couple below the target, and one that is currently above the fishery management fishing mortality threshold. But in general, most of these stocks have decent status, so it suggests that stock status alone is driving the landings in this region. We also look at total ABC or ACL, and the realized catch relative to the management target, and in the Mid-Atlantic this is fairly flat for the last decade or so. It suggests that it isn't big changes in allowable catch that are driving landings declines. Similarly, the catch within that target has been mostly within the target, so the red line in the plot below here on the lower right-hand side is where the median catch is across all the years.

There are a few things that go above the allowable catch, but for the most part things are below. It suggests that they don't really have binding limits most of them, and management is likely less to be playing a role in that landings decline so much. We can look at biomass in the ecosystem, and that too doesn't appear to drive the landings trend.

What you're seeing here are spring and fall, the two columns on the left-hand side, with piscivores, benthivores, planktivores and benthos. Basically, your different trophic levels of biomass in the ecosystem from both the Northeast Fisheries Science Center Bottom Trawl Survey and the NEAMAP Survey in red.

None of these have declining trends, basically, a couple of them have increasing trends. That suggests it's not overall biomass in the system. What we look at here then is we break up those landings into those same trophic levels, and we can ask, well which portions of those might be driving it. We see two negative trends, one is planktivores in the Mid. This is actually the long-term fishery consolidation in the menhaden fishery that is driving this trend here.

Then for benthos in the Mid, we're seeing both in red. That is Mid-Atlantic managed benthos, that is surf clams and ocean quahogs, and then black it adds the New England managed ones, so that is scallops. Basically, the suggestion here is its markets for the surf clam and ocean quahogs, because they are not currently hitting their quotas.

Possibly availability of scallops that are driving this decline in landings for benthos in the Mid-Atlantic. The reports suggest continue monitoring for things like climate risk, because benthos is really economically important, and also somewhat susceptible to things like ocean acidification and temperature, and to keep monitoring things like ecosystem, composition and production changes that are shown later in the report, as well as changes in fishing engagement, which can all effect landings.

For the story of New England, similar decline in commercial and recreational landings, but possibly different drivers in New England. We go through the same set of indicators, and in New England there are actually more stocks that have status that would require rebuilding. That does suggest that keeping landings low to allow rebuilding is one of the reasons that we see lower landings in New England.

A survey biomass though looks a lot like in the Mid-Atlantic, we don't see big declining trends here, so that suggests biomass is an unlikely driver for the landing's trends in New England, and we can break those up similarly to the Mid-Atlantic, and ask what's going on here? We do see declines in piscivores in both Georges Bank and the Gulf of Maine, and planktivores in the Gulf of Maine, benthivore's in Georges, so a lot of these do have to do with requirements to rebuild some of the individual stocks, which may actually constrain fisheries for other stocks, as well as market dynamics. There are probably other things affecting recreational landings though. For sharks it's fishery management, and possibly the survey methodology that we use for understanding recreational fishing.

The same recommendations to monitor changes in the ecosystem for landings drivers in New England. Slightly different story, maybe different drivers, but that is an example of how we try to look at multiple system drivers. I'll just briefly show you one of our risk sections for meeting fishery management objectives, that is fish distribution shifts and Cetacean distribution shifts, so these are risks to spatial management.

We are, as you know, seeing changes in distributions all across the ecosystem. These are coastwide indicators are in both reports. We see this increase in a long shelf distance. That means basically everything is moving to the northeast, in terms of fish and invertebrates on the Northeast Fisheries Science Center Bottom Trawl Survey.

They are also moving into deeper water over time. For Cetaceans this one is broken up by seasons. You see a lot of these species are moving in the same direction, with some moving in a different direction by season. It's not always in the same direction, but there is a lot of movement going on out there with a lot of our managed populations.

Some of the drivers potentially of that, could be forage fish shifting. It could be changes in temperature and changing ocean habitat. Just briefly, some of the indicators on those, we're seeing eastward and northwards significant increases of forage fish in the fall, all across the shelf. We're

seeing a long-term increase in sea surface temperature.

I think that is well known to everyone, but especially the last decade has been very warm. We're seeing a change in the Gulf Stream, where it is getting further north along the coast, and that will change the habitat available to these species, and potentially drive distribution shifts. Another important component of the habitat is the Mid-Atlantic cold pool.

We're seeing that cold pool gets both warmer over time and smaller over time. These changes in habitat temperature and forage will all probably drive some of these changes in distribution that we're seeing. The outcome here is we're suggesting that the distribution shifts are basically unlikely to flip back, they are likely to continue.

What we're hoping to have online soon is near term oceanographic forecasts, but we're going to have to also understand how some of the changes in ocean habitats are affecting these species. The good news is, I think, ASMFC as well as the Councils are involved in the East Coast Climate Scenario Planning, which I think will help coordinate some of the management here, and there are a lot of projects going on with near-term predictions of distribution shifts.

Hope to bringing more information on this in the future. I'll just end with the 2023 highlights, because these may be of interest to folks on the Commission. We're seeing hypoxia, like I said, and ocean acidification off New Jersey in 2023, so the pink line over here in the middle plot is showing you where there were dissolved oxygen less than three milligrams per liter. That is kind of a big deal in the coastal ocean, doesn't happen very often. The red exes are showing where there were mortality events. But again, like I said, it was record-low hypoxia in Chesapeake Bay, so it is not like a blanket statement, how things are changing in the oceans here. The sea scallop recruitment that was detected to be strong in spring of '22 was basically gone in 2023, and we think this was a mortality event.

What we're showing over here on the right-hand side of the screen is the number of days in 2022 where bottom temperatures were at or above the scallop stress temperature, about 17 to 19 degrees C, and this box here is the Elephant Trunk Area, and the light green is showing you that those temperatures at the bottom, what was stressful for scallops, were experienced for over a month in 2022.

That is some suggestions that we are seeing enough changes in the habitat that could start to affect some of these important commercial and recreational species. The other thing, like I said, the Gulf Stream was actually inshore and had fewer rings in 2023, so this can affect things like the offshore Illex fishery, as well as any of the other fisheries along the shelf.

We did see warm waters get all the way up onto the shelf, which can be episodic events that could threaten some of these species, especially the ones that aren't mobile, like scallops. We don't know the implications to this yet, but it's something we'll be keeping an eye out for, for future reports.

Similarly, there was a huge phytoplankton bloom in the Gulf of Maine, as well as a bottom heat wave, so you're seeing it in the plot, the red is how much higher it was than normal for the chlorophyl in the Gulf of Maine, it spread down into Georges Bank, a little bit into the Mid. You can see the green line is the chlorophyl for each of our regions, Georges Bank, Gulf of Maine and Mid-Atlantic, and you can see the Gulf of Maine this summer was off the charts here.

This was not a species that is typically eaten by a lot of things, so it's not clear that it's going to make its way into the food web. The jury is still out on what impacts this might have, but again, we'll keep an eye on this for everyone and report back next year. I want to thank everyone for your attention. I know that was kind of a whirlwind, but I just wanted to give you a taste of what the reports are like.

This is a list we hope that is complete, of the people who are contributing to this report, there are many. There are at least 20 institutions, at least 80 contributors here, and we have to thank them all, because this could not be done without them. I'll

leave you with some references and also, these are links to the additional resources, for anyone who would like to follow up, and I welcome any questions or feedback. Thanks very much.

CHAIR CIMINO: Thank you, Sarah, that was fantastic, and as enjoyable as the longer presentations are for the Councils, I truly appreciate getting this out to the Commission, and you taking the time to help us do that. I think it is a tremendous tool. There are many elements of the report now, I think that are just stuff that states can have at their fingertips that they just couldn't do on their own. I encourage anyone who hasn't looked at these reports, to please do so. As Sarah said, she is ready for questions or she would appreciate feedback or comments. I'll look for hands. Jason McNamee.

DR. JASON McNAMEE: Doctor, great, just thank you very much, great presentation. Always really enjoy these, as Joe mentioned. I look forward to them. Another great, or I guess couple of reports here, good context. I wanted to in particular mention. I think you guys are so thoughtful about the visualizations that you put into the report.

I appreciate that, I think they are great, they are super intuitive, and I always get good ideas from looking at the way you guys visualize the information. Just feedback, and you requested it during your presentation. I like the notable events or your kind of like headline parts of the report. It's great.

You know I think we all think of different things that happen locally, but it's nice to get that kind of, you know the headlines from the group of experts, like what you saw as being particularly important. I like that. I hope you keep that. Then the final comment I'll make is, there is a risk policy initiative going on at the New England Council right now, and the Commission has also been working on one for a couple of years.

I see these reports as being super critical to those, and so the one that we're looking at for the New England Council, which is still in development, it has a lot of similarities to what we're looking at, at the Commission as well. It has these kinds of categories in it that we'll need at some point, indicators to kind of put the information in there, to know if we're in a good spot or a bad spot, or what have you. I just wanted to flag that for you and your group.

I'm guessing at some point we're going to need to connect in with you all, to start to hone in on kind of a core set of these indices, in particular, I think some of them are intuitive for us. But the socioeconomic indicators, and so far, both of the risks policies have that type of information in them. That's just a flag for you. You know I would love to; we would love to I'm guessing, connect with you all to knock heads on that a little bit at some point.

I offer that, because I think I always really enjoy these reports. I think they provide awesome context, but I also always try and think about ways we can operationalize some of this stuff, and these risk policies I think, are a place that we can really operationalize directly some of this information. Sorry, that was probably longer than you wanted, Mr. Chair, but I appreciate the time.

CHAIR CIMINO: Other hands? Loren, go ahead.

MR. LOREN W. LUSTIG: Thanks to our speaker for a fascinating report. Early on in the report, under the section relating to recreational opportunities, I took note of two terms, effort, and as a lifelong angler, I certainly understand effort. But the second term, effort diversity, I would like to have a little bit of clarity about that. For example, does that relate to the angler seeking different species, or focusing on different habitat areas, for example inshore or offshore, or even the amount of time spent on the water? A clarification would be helpful. Thank you.

DR. GAICHAS: Yes, absolutely, and sorry I could have shown those indicators, but I selected the landings one instead. The effort diversity is actually, it's broader than what you are describing. It is intended to get a picture like across a really big area. The effort diversity is more by just sector, so it is asking, basically, what proportion of the recreational effort is from shore-based angling from party charter or from headboats.

Yes, I think it's really just three sectors, and I apologize, because this is not my area of expertise. But the diversity is looking at the composition of the full recreational effort across those sectors. What we're seeing is decline, basically in the party/charter component of recreational fishing, and a shift more toward shore-based angling.

What that suggests in the report is that the overall number of recreational opportunities has been increasing, but the sort of different options to participate in the recreational fishery are changing, and possibly reduced because of this reduction in the party charter pool. I hope that helped.

CHAIR CIMINO: Yes, Loren is nodding his head. It does for me as well, and I know that I can only speak for what we've been requesting in the Mid-Atlantic, and part of that, Loren is, you know to understand opportunities and what is changing and what we need to focus on. I believe I saw Lynn's hand. Go ahead, Lynn.

MS. LYNN FEGLEY: Thank you, Dr. Gaichas for this awesome presentation. I really appreciate you and your team and your ability, your really big thinking and in your ability to fill it into something like this. I have some questions or a question, sort of a little bit of feedback. About the Chesapeake Bay and I know that we're starting to get some information about the Bay to you through the Chesapeake Bay, the NOAA Chesapeake Bay Office.

But I wonder if there is a way to tackle places where the Bay is really linked to some of these ocean indicators that we were looking at. I was checking out a figure, 55 in particular, which shows the path of that bolstering in October, which is about the time when we'd have other baby Callinectes out there, the little blue crabs. We're suffering from low blue crab recruitment in the Chesapeake right now.

There are some of these real key Bay species, and obviously coastal species like striped bass, that are they are linked from the ocean conditions to big conditions. I don't know, I mean that is really hard stuff to get at. But I throw it out there, wondering if you guys can do that. With your big thinking that is just awesome, so thank you.

DR. GAICHAS: Thank you for the excellent suggestion. We do get really good stuff from the NOAA Chesapeake Bay office each year, as a contribution to the report. That's how we knew the hypoxia was lower than average this year. But I think that's a really excellent point, because I think right now, you know we've got all our data in the coastal ocean.

They've got all their data in the Bay, and we've been putting them in the same report, but have not been able to spend much effort into synthesizing connections. I really like that suggestion, and let me talk to the folks there who are contributing, and see if there is some way we can start to work on that. My guess is we won't have a great answer for you in next years report, but if we work towards it, I think we can start to get there. I think we would all really like to see the estuarine coastal ocean connectivity a bit more. Thank you very much for that comment.

CHAIR CIMINO: Any other hands, comment. John Clark.

MR. JOHN CLARK: Thank you for the fascinating report, Dr. Gaichas. I was just curious about a couple of the trends you mentioned there. The ocean hypoxia, is that something that has periodically occurred over the years, or is it something that is increasing? Then with the Gulf Stream shift, is that something that seems to be a more permanent feature, or is that something that moves back and forth over time?

DR. GAICHAS: Yes, thank you for the questions. I'll do my best to answer them. I'm not a physical oceanographer, but my understanding is that the hypoxia that we observed in the coastal ocean is uncommon. You can get hypoxia in Bays and enclosed waters, because you know they are enclosed, and the water can kind of sit there and the oxygen is depleted if there are too many nutrients. But the coastal ocean is much more open.

It's unusual to see this type of thing happen in the ocean, and it's kind of a confluence of like temperature, and also the local oceanography may be trapping water where it would normally be kind of ventilated more. My understanding is this is rare, but we don't know if we're going to keep seeing it. Luckily, Rutgers has these different gliders out there measuring it in real time, so we are definitely going to keep an eye on that, and try to understand whether something has changed and we can expect to see this more.

In terms of the Gulf Stream, again I'm not a physical oceanographer, but people were really, I don't know how to put it into words. The oceanographers were very kind of excited about 2023, because of how different it was. The Gulf Stream was doing things that they hadn't really seen before, and so they are also trying to understand if this is a new pattern that we're locked into, or if it's just being variable.

My understanding is the Gulf Stream has gotten more variable over time, so it's got more of these meanders, and it can make more of these warm core rings, which is the plot you are seeing in the top right here. There was kind of a shift from having maybe 20 rings per year to having something more like 35 rings per year.

Right around 2000 that was noted, but then recently again this year, it kind of dropped back down into the 20 range. But the Gulf Stream was acting very differently. I think we still don't understand if this type of behavior from the Gulf Stream is to be expected more in the future, or if this was just a one-off thing in 2023.

But it is definitely something we're keeping an eye on, because the Gulf Stream is extremely influential, as you know, on what is going on in the coastal ocean here. We're seeing the oceanographers just keep using the word crazy for this, and I trust them, so I wish I had a better answer for you, but that is why we put this out there. We want to kind of keep an eye on it. Thanks.

CHAIR CIMINO: I'll just follow up, John, as far as monitoring off the coast of New Jersey, and the DEP, I 'm proud to say, has been doing that for quite a few years. DEP and the Board of Public Utilities in New Jersey, have required through the offshore wind solicitations, money to go into research and monitoring. Not only will we be continuing the work that we've done with the gliders, but we're going to be adding to that in several areas. Any other hands?

Okay, Sarah, I'll take a minute, and I apologize if I should know this. You know at the Councils we ask a lot of these reports. But is there kind of like at the end of a peer review. Is there a research recommendation? Are there things that we have listed out as priorities that we also have wanted to look at, but we just don't have the data, and so there is something available to say, you know if the funding is ever available that we would kind of dive into that.

DR. GAICHAS: Yes, I think what we do is kind of gather comments from all of our management partners, and we produce a list. I think I sent you all that, it's called the request memo. Currently it has the requests from the Mid-Atlantic and New England Councils. If ASMFC would like to add to that, like obviously we can't get to all of it right now, and we are trying to prioritize that.

We've worked through that with the Mid-Atlantic Council, and this year we would really like to work through it with both Councils, but there are probably common things that are useful to all the managers in there. I would love to have the Commission as part of that as well. I think you can send us written comments, you can just send us an e-mail.

Yes, we keep that list so that we know what the highest priorities are, so that we don't just always do the easy thing, and we're actually working towards doing the harder things that take a little bit of time. We do use that when we can get extra money or extra funding to put somebody on specific indicators or projects. Is that what you were getting at? We would be happy to have more comments from the Commission.

CHAIR CIMINO: Yes, thanks. No, I guess what I'm getting at is I should have known. Toni also has a comment, so I'll let her go.

MS. KERNS: Thanks so much, Sarah, for presenting. I really enjoy these reports, and it usually takes me a couple times to absorb it all. Sarah presented this report to the Core Team, which is the team that works on the East Coast Climate Change Scenario Planning Group, and the five management bodies will set priorities each year for all of the Councils, the Commission and NOAA, to think about what of the draft action plan items that we want to tackle.

We use this report as one of our items to try to figure out what is needed to be updated or changed in that draft Action Plan. One of the things that we talked about is trying to help get additional funding for Sarah's group, so that they could include more state water bodies. We are lucky that we got the Chesapeake Bay information, because of that NOAA Chesapeake Bay Office, and provide it to them.

From what I understand from Sarah, it's not that they don't want to include that data, but they just don't have the staff resources to bring that additional data in, and then synthesize that you got it into these reports. That is one of the priorities that the Core Team did put in there, to have those additional resources, so that these reports can have some additional information for the states to help us better understand how our state water bodies interact with these ecosystems.

CHAIR CIMINO: Any other hands on this? I'm not seeing any, you said there is one online? Okay, I'm going to turn to the public then, we have one online. Mr. Fletcher, go ahead.

MR. FLETCHER: James Fletcher, United National Fishermen's Association. I have a question. If I made the same presentation and laid it all to nano and microplastics and plastics, none of the other things that you mentioned, just nano plastics, micro plastics and plastics and manmade other chemicals.

Couldn't I make the same presentation and lay it all to the introduction of plastics, and the plastics in the Chesapeake Bay, and the plastics on the bottom where the scallops are? Isn't this program totally missing the effects of plastics; micro, nano and even smaller? My question is, why did nothing in this report mention plastics? Thank you for your time.

DR. GAICHAS: Thank you. I appreciate that, and I agree. We don't have a lot of information on that, and I think it is sort of a missing piece for us is pollution in the offshore environment. I think if we could get the additional resources, I think that is something that we could look into, for the scallop die off in particular.

I know that the Research Track Working Group is looking at multiple things, not just temperature. They are looking at things like disease, and so I think contaminants are not off the table there at all. I just don't know what information they might have. But I would say that we're not ignoring git, we just don't have great data on it.

CHAIR CIMINO: We don't have any other hands online, but I will ask if there are any members of the public in the room that have any feedback for Dr. Gaichas. Not seeing any, Sarah, I think you're off the hook. Once again, really appreciate you taking the time to do this, presenting this to the Commission. I hope that our Board members will continue to use this as a tool.

DR. GAICHAS: Great, thank you, I'll stop sharing now and hopefully I won't break anything.

MS. KERNS: Thanks, Sarah.

CHAIR CIMINO: Commission members should be familiar with the industry-based survey discussions that have come up recently, and the importance of them.

NORTHEAST TRAWL ADVISORY PANEL PROGRESS REPORT FOR INDUSTRY- BASE SURVEY PILOT PROGRAM

CHAIR CIMINO: Our next presentation, next agenda item is the Northeast Trawl Advisory Program Progress Report on the Industry-Base, they like to call it IBS for some odd reason, Survey by that program. I like to call it moderate to severe industry-base survey program, sorry Dan.

MR. DANIEL J. SALERNO: That's quite all right. Yes, I've heard that joke a number of times already, so definitely understand where you're going on that one. For those that don't know me; my name is Dan Salerno. I'm a New England Fishery Management Council member from New Hampshire. I'm also the Northeast Trawl Advisory Panel Co-Chair for the New England Management Council. I also wanted to make sure you understand that this report that I'm presenting to you guys has already been presenting to the New England Fishery Management Council and the Mid-Atlantic Fishery Management Council. This report has been put together by not only myself, but also the Co-Chair from the Mid-Atlantic, which is Wes Townsend, who is also the Chair of the Council, and also Dr. Kathryn Ford, who is our Northeast Fisheries Science Center lead.

Although she's not mentioned on here, we couldn't have put this presentation without our Mid-Atlantic staffer, Hannah Hart. I'll just jump right into it. Just to kind of give a sense of where we're at, the industry-based survey, is actually part of a larger contingency plan. We have put together the Bigelow Contingency Plan.

This was put together, because we've known in the recent past that the Bigelow in itself, the performance has been not as good as they should be, and even when you take out the consideration of the COVID years, you know survey performance and tow completion has been a little suspect in the past couple years.

There was a request to develop a contingency plan, basically when the Bigelow is not available on short notice. This doesn't take into account when the Bigelow is going to be going off the line for its midlife repair in a couple years. We already know that if that is the case that the Pisces, which is a sister ship, will be taking over.

But this larger Bigelow contingency plan is when the vessel just can't get out of the shipyard on a timely basis. Just to kind of give a where we're at with some of those other pieces of the pie. Obviously, the Bigelow contingency plan has, our number one idea is looking at the Pisces. You know as the sister ship, their readiness plan has been drafted, and is being refined through the National Marine Fisheries Service and the Office of Marine and Aviation Operations.

The Pisces is primarily the Southeast Fisheries Science Center's vessel survey vessel, and it will become the primary backup for the Bigelow, in case there are issues with the Bigelow. Obviously, there are some concerns here, when we're looking at, well when do you trigger that the Bigelow is not going to be available? How do we get the Pisces here?

Is the Pisces ready? Is there funding? Is a specific plan in place to have the Pisces kind of sitting and waiting? There are also concerns with this from the NTAP, particularly from the industry members is that the Agency feels that getting the vessel from Mississippi to New England shouldn't be a problem, you know we could probably get it here in a week's time.

Where some of us more feel that this is probably more of a two-to-three-week time period of getting that vessel up in here into the New England region, and actually conducting the survey tows as needed. Another option in the contingency plan is, you know looking at the Northeast Fishery Science Center, is having another vessel calibrated to the Bigelow.

This proposal actually is on the table. It is in the hands of the Science Center's Director, Dr. Jon Hare, and is being discussed at Headquarters. There is kind of an optimistic timeframe that this will only take about a year to a year and a half to acquire a vessel. This is actually a real-world concern, because as some of you know, that this is where the Gloria Michelle comes in, it is the vessel that conducts the, well it used to conduct the Shrimp Survey, it also is the Massachusetts State Survey. This vessel is actually, it's ending its end of life, so there is this concern that there will be a new vessel coming online to fill in where the Gloria Michelle used to.

Part 3 of the plan is looking for an industry vessel that is calibrated to the Bigelow. While there is no progress on that, but there are some commercial vessels in probably the New Jersey, Mid-Atlantic

region that may be able to fit this bill. But like I said, we haven't really made any movement on that as the contingency plan has been moving forward.

What we're really here for is an update of the IBS Survey, the Industry-Based Survey. This is going to be a separate survey that is not calibrated to the Bigelow, so in essence the theory is that this would be a whole new time series moving forward.

Just to give an idea of how we got here. As we all know that in September between the Commission and the two Councils have requested from the Science Center a white paper on what it would take to do, outlining what an industry-based survey would look like, and that was presented to all of us in the January/February time period.

There was a follow-on request from the Science Center to further develop, put some more meat on the bones of actually developing a pilot survey, because the feeling was, yes, we have a white paper, but we wanted to take it to the next step to make sure that this is something we wanted to move forward on.

There seems to be a lot of momentum behind everyone that between the Commission and the Council and the industry, did the Science Center really feel that this was probably something we do want to move forward with. Where we're at right now is, there has been some movement of how we're putting together of what a pilot would look like.

We did have some early discussions at the full NTAP Panel meeting in early February in Virginia. But we also had a more dedicated working group to really answer, start drilling down, what are some of the things that we would really like to see in an industry-based survey, and what can we look at in a pilot survey?

One of the main objectives that we kind of felt was important is, this industry-based survey should be able to work in wind farms. Obviously, we all know that wind energy areas are popping up, theoretically up and down the coast. We're really looking at, can this industry-based survey, through the pilot. Can we determine, can we do this survey work within wind energy farms.

We feel that this is a possibility or probability, because as we know some of these areas that are already up and running, being developed in the southern New England region, do have vessel-specific monitoring, industry monitoring vessels in there. But keep in mind that those have different objectives, as opposed to what our industry-based pilot survey would be doing. Our focus is on looking at what we would need for stock assessment needs, you know so looking at indexes of abundance. Our plan was to use the same strata as what the Northeast Fisheries Science Center does for the Bigelow. Currently the stratification for the Bigelow is under review, and vetted changes come out of that, that would be applied to what we would do in this industry-based survey under the pilot. We feel that the focus of the industry-based survey, as we mentioned is for stock assessment needs.

This is not a full-blown ecosystem type of survey. We would be looking to truncate our depth strata to probably the 130 to 150 fathom max range, instead of going out to the 200 plus. It would really be an analysis of what is the bang for the buck? Where are we getting what we need for stock assessments, and kind of cutting it off, you know where we start losing that dataset that really doesn't add to the stock assessment needs.

Our survey focus, we are looking at multiple ages, it's not going to be just one specific area, so we are interested in looking in the Gulf of Maine area, the Georges Bank, the Southern New England and the Mid-Atlantic. Under the pilot survey we're looking to see what we can do between a five-to-ten-day window in each area, but not necessarily at the same time.

The reason why we're looking at maybe doing it in different timeframes, because this is probably even under a pilot, this is kind of a resource intensive, between equipment, humans, vessels. We're kind of looking to how we can do this on a cost savings approach as well. There has been discussion of what

type of vessels, how much survey, is it going to be daytime, 24 hours?

What we've settled on is looking at similar size paired vessels operating on a 12 hour per day basis over the 24 hours. To answer the question of, well day tows versus night tows. We figured we would split it up more along the noon to midnight, and the midnight to noon. For full effect those would be both surveying, the pairs would be surveying both nighttime and the daytime, to hopefully get away from some of the concerns of the bias of the day and night fishing.

The survey gear approach, we agreed on that we're going to use the same trawl gear that is used on the Bigelow, that is the 400 by 12 four seam net. But we're not going to use the same doors that are on the Bigelow. How we plan to approach the door question is using the Rhule rope or the restrictor rope that has gone through some study recently on the Darana R.

Basically, we're going to use that. It's a rope that is using to connect the two doors to kind of standardize the spread over multiple depths, and it also helps to standardize the gear across multiple platforms as well. It kind of gets to, well we know the gear should be doing the same thing regardless of who is towing it and where they are towing it.

One of the other things that we discuss is that we don't feel an otter trawl system is necessary. The otter trawl system, for those that don't know. This is what is used on the Bigelow to constantly ping and bringing in and putting out wire, to make sure that it's based on tension, to theoretically keep the gear in line.

But we feel that this is probably overkill, and this is also something that would potentially add to the cost of our pilot, and overall if we did move forward with an IBS Survey. What we're looking to collect. Under this pilot program we're trying to see what we can collect; how much we can collect. This not only includes the biological data, but we're going to be collecting net mensuration gear. All the electronics that are on the vessels, you know also looking at CTD tasks, plankton and the acoustic data. We're trying to get an understanding of what we're going to collect. But one of the things that we're also looking at is trying to use what is available, so what is on the vessels currently. You know if we would use their net mensuration gear, or whatever electronics they have on the vessel.

Some of the other objectives we're looking to under the pilot right now is we want to meet with other scientific survey crews in the region. Obviously, specifically we're referring to the VIMS NEAMAP Survey folks, the Science Center folks, also the Maine/New Hampshire Trawl folks, also the Massachusetts, to get an understanding of the sampling stations that are needed.

Obviously, we would want to have some kind of portable system that could move from vessel to vessel, and these things have already been developed across other platforms, so what does it take? Where could we save some time and energy and money in looking at what has already been created?

We're also looking to develop some workshops with those interested vessel captains/owners that would be interested in participating in the pilot survey, just to give them an understanding of what the expectations are, what would they be doing for us, and what we could be doing for them, to help them get this moving forward.

Those are the things that we've worked through already, and I think we have a good handle on. If we move to the next slide, this is where we're still lacking on what we need to kind of work through. These are the elements that we still need to kind of think about, and I think we'll probably be looking at this over the next couple months, between now and probably summertime, when NTAP has another full membership member leading.

One of the key questions is, who is going to manage the pilot, you know as we develop it and go through an implementation process? Will this be directly with the Science Center? Will there be a third party that is going to be brought onboard to do the pilot?

This is also kind of thinking not only just the pilot itself, but if we moved into a larger scale, you know there are resources that we need. Even if it's a third-party entity, we need to include that.

There still will be resources needed from the Science Center. We need to get a better handle on the management of the project. As I mentioned, these work sampling stations, we need to get an understanding of what is required for space, and also the electrical requirements. Keep in mind we're doing data collection.

Electronic data collection nowadays, you're talking about computers, not only on deck, for the link for the input of the tablets and what have you, but we're also having servers onboard on the vessel as well, so there are obviously some additional electrical requirements that go beyond what a normal commercial operation would need.

There is also the data management implication. You know we're going to be collecting a whole host of data. We'll be using multiple net mensuration gear, also multiple electronic type equipment. Will we be collecting that in the same format, same frequency? There is that question. Will we be able to kind of collate all that data across multiple platforms? Also, we're looking at what we need to kind of think through is, what is the biological sampling and how much data we're going to collect. We're looking at the industry-based survey, hopefully we'll understand what is the volume, and who is going to process all this stuff? Who is also going to do the data analysis?

Those are some of the questions that we're still thinking about data wise. There are certain parts of the survey, the pilot survey, that would probably be more of on the water type review and refinement, specifically talking the scope of the water. How far behind the boat is the gear going to be depending on depth?

Also, the tow speed and tow duration. You know that when the Northeast Fisheries Science Center went from the Albatross to the Bigelow, again some changes in those components. It's kind of understanding of where we would like to see this industry-based survey looking at a time duration component, to get an understanding of, are we collecting enough without going overboard.

Obviously, the cost is a big deal. We've had some back of the calculation calculations of what we feel that this will cost, and a rather conservative estimate, we came up with is 1 to 2 million. I know there have been some people looking around that are actually probably looking for more in the range of 3 million dollars, just to get this pilot survey up.

I think it's a good estimate, because we want to have a good robust pilot to inform, if we went further on in industry-based survey. Also, some of the other discussion points that we need to work through is the statistical design of what this industry-based survey would look like under the pilot. You know, do we want to capture some of those shallower depth ranges that were lost when the Bigelow came on?

The timing of the survey, obviously the highlight here is because, you know we talk about wind energy areas as one of the big elephants in the room when we talk about loss of survey strata. But other, as we saw in the last presentation. You know we're seeing climate change effects. Do we want to focus this survey to kind of focus on, do we want to address how climate change has affected the catches in our current surveys?

Do we want to look at maybe doing a survey at a different time period versus what is being conducted by the Northeast Fisheries Science Center? Also, we're thinking about, do we want to overlap with some of the other NEAMAP surveys? How far inshore do we want to cover into some of those state water strata? We also need to think about the design in itself when we're talking about the adaptability for the future loss of survey areas. Obviously, it is a Southern New England, Mid-Atlantic region.

What we're seeing now is a lot of these fixed-station wind energy areas. There is potential for these offshore aquaculture operations that we're going to lose, that we may or may not be to tow in and

around. But keep in mind in the Gulf of Maine, and even in the Southern New England/Mid-Atlantic regions, some of these further offshore areas, we're going to have floating ones, which is a whole different concern of how mobile gear type surveys will be able to operate in that. That is basically a lot, those are the things that we're still trying to work through. I think we have some good ideas. We have a very good panel. Hopefully we can get through that. We've gotten some really good feedback from the New England Council, the Mid-Atlantic Council, of how we can kind of proceed. But that is where we are right now. That is all I've got for you guys, open to any questions, concerns, comments and I'll definitely bring it back to the larger group as we move forward on the IBS Survey. Thank you.

CHAIR CIMINO: Thank you, Dan. I'll look around the room. I don't think it could be stressed enough how important it is to get this going. We appreciate the progress report, but there is still quite a bit left unanswered. I'm going to go to Pat Keliher first.

MR. KELIHER: Dan, thanks for that report, it was excellent, and a lot of really good background. One of your last slides you gave a cost for the industry-based survey for this pilot of 1 to 2 million dollars. ASMFC has highlighted within our appropriations priority the need for 3 million. I'm wondering what the disconnect there. Is it because we have potentially data analysis and processing built into our numbers that is not in that number? I just want to make sure that the numbers that we're using line up with what the need is as we're talking to Congress.

MR. SALERNO: I appreciate the question, Pat. I think you've hit on it pretty well; you know. I think when we were looking at the 1 to 2 million, we were thinking of hardware, software, you know the physical. But as you mentioned, we didn't think beyond of who is going to do this data? Who is going to do the management? Who is going to do the processing? I think you are in the ballpark there of closer to the 3 million, when you consider the overall, every component of the project.

CHAIR CIMINO: Other questions or comments? John Clark.

MR. CLARK: Yes, I'm just curious, Dan. Do you have any idea how many industry vessels would A. be eligible to do this work that are the right size and all that, and B. would have interest in doing this?

MR SALERNO: I can answer A, a lot easier than I can the B. We're trying to design the survey around being cost conscious, but also making sure we can have a larger pool than participants. Some of the things we thought about not having an otter trawl. I mean there are very few vessels in our region that have that, so by not having that, that opens up the pool of candidates.

By not going out to the 200-fathom depth, that also opens up a larger pool of candidates that could participate in this. We're probably thinking vessels in the 70-to-90-foot range, which as you know that is a pretty fair number of vessels in that range. Anything larger, you know if you were talking about the 24-hour sampling.

This kind of gets to our Part 3 of the Bigelow contingency plan. When you're trying to replace the Bigelow with something that could do what the Bigelow does, you're really shrinking that pool down. We're trying to make sure that we're having a program, a project that is getting what we need but that could be open to more people. I would turn to Chairman Reid, who has his ear to the ground more with the industry of who would be interested. But I would think that there would be definitely folks interested in participating in this, because as we know, we always hear that the industry is like, we want to help you with your survey methods, where can we get online and work through with this problem with you. I think there will be interest. We just don't know who the candidates are yet that would be interested.

CHIAR CIMINO: Thanks, Dan, for that answer. I believe Chairman Reid had his hand up, so Erick, if you want to go ahead.

MR. ERIC REID: Thanks for the question, Mr. Clark. You know we are not replacing the Bigelow with an industry vessel, because of what Dan said. There are maybe one or two vessels that are capable of that.

But in order to do it with industry vessels and accomplish the tasks. You know one of the reasons we went to the 12-hour day, noon to midnight, midnight to noon, was crew size. The horse power and the tow capabilities of a lot of boats are reasonably the same.

But when you're talking about a science crew of 15, 17, something like that people for a 24-hour day operation, nobody can carry that many people, or very few boats can carry that many people. That is why we went to the two-boat system, where you have room for the crew, you know four guys or five guys, and a room for a science group through four or five guys as well. That brings a lot more vessels into the pool of possible candidates. The other thing is, the use of the Rhule rope.

That stabilizes the gear regardless of the vessel effect, or reasonably without the vessel effect. You're only towing one mile at 3 knots, so the horsepower capability of those boats can cover a very, very wide range. There are a lot of reasons for the way we did things, mostly to get the data we need. But to get the industry one, to participate, and two, to buy-in, which they're all buying in already. I think we'll have plenty of willing participants.

CHAIR CIMINO: Thank you, Eric, any other questions or comment? Go ahead, Kris.

MR. KRIS KUHN: Yes, Dan, more of a clarification question. You said the intention, I guess the stated intention was that the continuation for the IBS would be essentially starting a new survey, so a continuation of the datasets. I'm thinking of the way we use stuff for stock assessments, and use the historical data going back in the Albatross/Bigelow combined, that we wouldn't really be able to get the continuation in the datasets for a lot of species that we currently use with the groundfish survey.

MR. SALERNO: Yes, because this is a new dataset, I mean and that is the approach that we're taking. This will be a new dataset, so using indexes of abundances, obviously we would take, you need a number of years before we could start using that. But I think there are other data components. You know some of the environmental data collection, or even some of the biological weight at age or maturity. That type of information could start feeding into the stock assessment sooner. But yes, anytime a new survey starts, we understand that it is going to take a while before at least the index of abundance type information can be used in a stock assessment process.

CHAIR CIMINO: All right, Dan, thanks again. We don't see any hands here, so I think that is going to wrap it for now, and we will appreciate continued updates on this.

MR. SALERNO: Okay, thank you.

CONSIDER REVISED GUIDELINES FOR RESOURCE MANAGERS ON THE ENFORCEABILITY OF FISHERY MANAGEMENT MEASURES

CHAIR CIMINO: Our next agenda item is Consider Revised Guidelines for Resource Managers on the Enforceability of Fishery Management Measures. For those newer Commissioners and those of us that are somewhat forgetful. Kurt Blanchard has promised that he'll give a little background on this. Without any other introduction, I'll turn it over to Kurt. Thanks.

MR. KURT BLANCHARD: Over the past year the Law Enforcement Committee has conducted a review of the guidelines for resource managers on the enforceability of fishery management measures. The Law Enforcement first prepared guidelines for resource managers on the enforceability of fisheries management measures for guidelines back in 2000.

In keeping with ASMFC direction, periodically review and update the guidelines, the LEC revised this document tin 2002, 2007, 2009, 2015, and now the Sixth addition in 2024. The LEC strongly encourages managers to consider the enforceability of all management regulations that are developed.

We believe the guidelines to support and strengthen the effectiveness of the Commission's efforts to conserve our marine fisheries resources. Compliance in natural resource regulations help to ensure

sustainable fisheries. Many factors contribute toward compliance, including but not limited to perceived legitimacy of the regulations and/or process, moral norms, voluntary compliance, enforcement and enforceability.

The guidelines were organized into five sections for ease of reference. Section 1 is the general enforcement operations. Section 2, enforcement tools, it's a new section. Section 3, general enforcement precepts, Section 4, enforceability ratings, and Section 5, the enforcement strategies and recommendations.

Under Section 1, this section provides a statement on the general enforcement operations that should be considered when implementing new management options or strategies. Available enforcement resources are maximized by enacting regulations that can be enforced at more than one point during fishing activity.

Law enforcement relies on state and federal partnerships for at-sea patrol inspection efforts. Officers work with these partners to provide effective at-sea enforcement of state and federal regulations, particularly those involving area, gear and prohibited species restrictions. Section 2, as we stated is a new section.

Enforcement tools are management measures that are not specifically designed to limit catch or effort, but to aid in the enforcement of other management measures that do so. Enforcement tools such as electronic reporting, prelanding notifications, and VMS have improved the effectiveness of certain regulations, by allowing enforcement staff to focus effort on high priority areas. These tools do not replace traditional enforcement, but rather complement patrol work and inspections. Requirement for some of these tools should be considered essential for affective enforcement of some management measures, for example, VMS for closed areas. Newer emerging technology such as cameras, ropeless fishing and others should continue to be explored. Section 3 are the general enforcement precepts.

These are kind of the backbone of the thinking of law enforcement in regulatory development. Simplicity, the most enforceable regulations are those that are simple, realistic, easy to understand, and presented in a acceptable way to the regulated community. Consistency, regulations should make every effort to minimize exceptions and exemptions.

Wherever possible, managers should adopt the same management measures among different fisheries management plans, across different state boundaries, and between state and federal waters. Stability, regulations should avoid frequent changes. When this occurs, there must be concerted outreach and educational effort to adequately inform the public.

Effectiveness, in general the most effective regulations for an enforceability perspective, are those based on controlling effort, closed areas and/or seasons and not the outputs, catch quota and/or trip limits. Most importantly, safety. Regulations should be designed so they do not create an unintended safety-at-sea issue.

Section 4 talks about the enforceability ratings. The 2024 Guidelines included a survey of 20 voting members of the LEC, who numerically rated the enforceability of 27 management measures based on three categories; dockside, at-sea and airborne. The enforceability of each management measure was rated on a scale of 1 to 5, 1 being the last enforceable, 5 being the most enforceable.

For each of the three categories, an average at-sea and dockside rating from the survey is also presented. It is important to note the survey indicated limited applicability for airborne resources in the enforcement of most management measures. Therefore, the airborne value was only included in the average ratings when it increased the average value of the management measures.

If the airborne rating increased the average rating, the inclusive average is indicated in parentheses. The results of the updated survey are presented below in a visual matrix. Management measures are arranged in descending order of their average ratings from the

survey. Responses receiving a score of greater than or equal to four are color coded in green.

Those with an average score greater than or equal to 3, but less than 4, are color coded in yellow, and those with less than 3 are color coded on red. Basically; green, slow down, stop. What you see before you now is the matrix. It's just for a quick reference snap shot on where Law Enforcement stands on different management measure.

As you kind of digest this a little bit, you'll see in the upper portion of the document, permits, slot limits, prohibited species, bag possession limit, low volume, minimum and maximum size limits, closed seasons and our latest or newest management measure that was added to this document is a tagging, labeling, marking of species. You'll see where those are basically 4.00 or higher, all in green, good to go. As you work down the document, you pick up on closed areas and gear restricted areas. Those have the dual values where the airborne applicability was added to it. You can see where the average of just dockside and at-sea fell for closed areas, for example at 3.26, with the added emphasis of the airborne, it rose to 3.58. Again, important to note on this document, as you go to the bottom of the document, where we get into the red zone.

Consistently over the last several editions of this document, and it continues to be, tagging prohibitions, limited drag and soak time always fall at the bottom. ITQs, IFQs, Limited Access programs, those still fall low, but I think that is based on the complexity of those types of programs. Section 5 talks about the enforcement strategies and recommendations.

This section provides information about each of the management measures that were considered in the Guidelines. Included is a brief definition of the measure, it's numerical ranking based on the survey results, and some thoughts for consideration when drafting regulations. For ease of organization, the management measures were listed alphabetically.

In 2009 the LEC evaluated 19 management measures, in 2015, 26 management measures. In 2015, 26 management measures, and now in 2024, 27 management measures. The tagging, labeling, marking of marine species. This was the added management measure for 2024. This slide to show you two pieces, one to talk about this new management measure, but also to show you the makeup of what each management measure is provided for within the document.

We defined what the management measure is. In this particular instance, the act of placing an approved manufactured tab, label or a manipulation/alteration of your perspective marine species, for the purpose of marking a marine species for management purpose. They include the overall rating of it, in this particular case, 4.00 in the green zone, you're good to go.

Recommendations that should be considered when adopting a regulation. Tags should be in an approved device that is identifiable, traceable and tamper proof. The tags should be placed in a marine species in a location that will cause least harm to the species, whether alive or dead. When any alteration to a marine species, (i.e., fin clipping, v-notching or other.) The requirement should be consistent among all jurisdictions.

Improved documentation in the labeling of fish and fish products, would enable the law enforcement to track such products back to the harvester and the initial purchaser, and to intercept unlawful seafood products at various points between harvest and final sale for consumption.

The LEC gratefully acknowledges some of our current and past members, who contribute time and expertise to the guidelines. We thank NOAA Fisheries Office of Law Enforcement, NOAA General Counsel, U.S. Coast Guard, Districts 1 and 7. This group being the authors of the enforceability precepts for the Northeast Regional Fisheries Management Councils, dated June, 2013.

For them sharing their publication with us, and allowing us to incorporate selected material from this document. I would like to thank the staff here, Toni Kerns, Tina Berger, Madeline Musante, for their

assistance in updating the document. We also acknowledge the opportunity afforded to our Committee by the Commissioners and staff at ASMFC to revise the guidelines, to make them available for routine use and reference. I'm available for any questions and I believe we need to ask for approval of this document.

CHAIR CIMINO: Toni says, correct. Let's start with any questions or comments. I'll look around the table. John Clark.

MR. CLARK: Yes, thank you for the presentation, Kurt. I was just curious. One complaint we hear often is individually marked gear, like in this case crab pots. I know from the enforcement side, counting them is very difficult, and yet there is a lot of concern that some might have too many out there. Has the LEC looked into something like drones and cameras on that for counting? Because I know how difficult that has got to be if somebody is allowed to have 300, 500 pots out there, to try to count everything.

MR. BLANCHARD: It's difficult to count fixed gear for trap and trap limits, based on a visual aerial type observation. We can detect where the gear is, but ultimately, you're not going to get a final count unless you're hauling that gear. To have those resources to do that, many states do have the resource to haul gear.

There are a lot of concerns in hauling of gear, liability concerns, things like that. Airborne, the interesting on airborne is only about 60 percent of the agencies have some type of airborne capability. We broke that out between traditional aircraft, drones, who has both, and who may not have any.

Basically, 36 percent of the Agencies had 0 use of aircraft. The other ones that did have, whether you're using drones, for example, are still working through some of the policy issues and all of that type of privacy concerns with drone use. Traditional aircraft, you're typically pretty good to go. But that is usually a shared resource, maybe from our federal partners, to a state partner or from a state-to-state partner.

CHAIR CIMINO: Other hands, Roy and then Craig.

MR. ROY W. MILLER: Thank you for the excellent report and the excellent visual. I noticed in that visual you used at the very end of your talk, where it ranked the various techniques. I couldn't help but notice that targeting prohibitions were ranked at the very bottom of that scale in the red zone, and yet we spent a great deal of time at yesterday's meeting and prior meetings, talking about targeting proposals, the very same thing that is ranked the lowest. I just wanted to highlight that. Thank you.

CHAIR CIMINO: Craig.

MR. CRAIG PUGH: I want to expand on what John's question was. I will listen, and that is why I'm asking you this, because I don't know what is really enforceable for a judge. If there was a time stamp with latitude and longitude of such gear, would that be admissible, and do you think that would be valid? Say, if you took that with a drone of a time stamp position from me to you, Pat Geer, boing, boing, boing. You take a latitude and longitude, apply that to that. I don't know if there is a certain calibration we have to do, like weight and measure. But wouldn't that be a reliable source in front of a judge, I would think? If I'm going to vote for that I think I would have a concern.

MR. BLANCHARD: Would a drone use some kind of stamp or location stamp on a drone or GPS use on the vessels, or whatever. Respective states and agencies have to prove the reliability of the device recording that. That type of information needs to be produced in prosecuting cases, so it does get a little bit complex on where you're trying to get that.

You could get into a situation, depending on the level of case, whether you might need industry manufacturers to come in and talk about proof of reliability of those devices. You know GPS in general has been more accepted within the courts, but it can rise to that level of complexity of having other experts come in.

CHAIR CIMINO: Jay.

DR. JASON McNAMEE: Nice presentation, Kurt. I also really liked the matrix. I bet that is shocking to you in particular. This is more of a comment, but I really did appreciate this, and I think it could be really useful as a guide, so as we're developing an addendum or an amendment or whatever. You know we are proposing different types of regulations.

We can use this as a guide to sort of flag, we often bounce back to Law Enforcement Committee to sort of have you guys verbalize what you now put together for us. I just offer that thought that we could use this as a guide, and maybe include it in some of the information that we are putting out for the public to see as well.

MS. KERNS: The resource is available on the website, right, so there is that tool. But we could also have staff, when we're pooling tools, remind the Board either in the PDT document, or in the staff presentation to say enforcement, this is a green or a red or a yellow on some enforceability guidelines. As Kurt said, some things have to be in context of what's going on. But the Law Enforcement Rep can also provide that context during the Board's discussion.

DR. McNAMEE: Right, just to follow up. I am in complete agreement. Yes, so however it lifts, we can sort of think about that. But I agree. Then I think it changes from what does enforcement think about this to now kind of digging into. We have this general statement of what enforcement thinks about this, put it in the context of this particular action, and how does it fair? I think it changes the conversation a little bit, makes it better in my head.

MR. BLANCHARD: Also, just to your point, and thank you for those comments. The discussion around the table with the final approval of this from the Law Enforcement Committee was that the representatives that sit at this Board table represent law enforcement, needs to reference this more. As you know, it's been around since 2000, and maybe anecdotally somebody might reference it. But we don't incorporate it typically in our response, and I think that is something we could do better.

CHAIR CIMINO: Pat, you had a comment?

MR. KELIHER: If a motion would be in order, Mr. Chairman, I would be happy to make one.

CHAIR CIMINO: I appreciate that, and I am so sorry to everybody, but I have a question. I know we're kind of behind on time here. We have the information on what is and isn't enforceable. Some of the stuff that really isn't so much, is stuff that is kind of really important to us, right. It's a way to manage. I'm just curious. I'm not going to put you on the spot, in the interest of time, so a yes or no. Has there been discussions around finding a way to do these things, say soak patterns, for example.

At least it's in there, or even targeting. For the most egregious cases, you absolutely know those nets have been there forever, and it's just a mess right now, but you can't pull it, because there is no regulation on it. Has there at least been a discussion on finding a way, that we're not asking you to enforce it at all times for everybody, but that there is something for the most egregious cases.

MR. BLANCHARD: The simple answer to that is, yes, we do consider it. We know that managers and these boards have a job to do and a mission to complete, and we want to support that. We don't discount any one of your management measures, it's just important to know, and we've mentioned on different occasions, like we use limited drag and soak time.

The amount is so manpower intensive to monitor that, because you will have to be there at time of set, you will have to be there at time of pull, things like that. To try to monitor those types of things. In a sense that is why we always talk about it. We talk more about use of technologies, because some of that can help us do our job better. It's an additional enforcement tool. It supports, it supports the management measure that you might be trying to facilitate. We actually now have the means to be more proactive in supporting that.

CHAIR CIMINO: Thank you, and I appreciate all the work that went into this. It was a great report. I'll look to Pat then for a motion. I appreciate that, Pat.

MR. KELIHER: Kurt, I really appreciate this report. It's clear that this is not a status report, you're making changes to this report based on the comfort level within the enforcement community about different things. I was able to witness some of those conversations a couple days ago. Appreciate the word on this, and with that thought I would **move to accept the modified report for usage by management.**

CHAIR CIMINO: Second by John Clark. The first one who had his hand up out of many. I'll read it into the record as written, Pat. The motion here with a second is, move to approve the Revised Guidelines for Resource Managers on the Enforceability of Fishery Management Measures. Any discussion on the motion? Go ahead, Adam.

MR NOWALSKY: No other discussion, just one other question about it. The enforcement element, I was surprised that out of the 27 management measures, prosecute or prosecution was only referred to for a half dozen of them, in the extended part here. At one end of the spectrum that says to me, well, 21 of these have a high percentage of being able to be prosecuted when used. When we bring it before a court the Court says, yes, this is good information. On the other end, I'm concerned that enforcement says we're throwing all these things out here, the courts don't really give a darn. Maybe there wasn't as much focus on the ability to prosecute here, because enforcement has just kind of thrown their hands up on the lack of prosecution that occurs. I'm hoping the answer is closer to my first part, but I would like to know your thoughts on why we didn't hear more about the success level of prosecution with these management measures.

MR. BLANCHARD: Maybe it's unintended in there, but I think the success level of prosecution comes from the values being rated higher. I don't have that right in front of me, as far as which ones had prosecution mentioned in each and every one of them. But I suspect that those were in the lower column, more in the red columns or the low yellows. I think it is implied that they are more enforceable. They are more enforceable. That prosecution element comes into that also. Thank you, Adam.

CHAIR CIMINO: Any further discussion? Not seeing hands. **Any objections to the motion? None, okay. I'll consider that passed by consent.** Once again, thank you, Kurt. Next up, and sorry for the delay. Dr. Katie Drew on the Stock Assessment Updates.

STOCK ASSESSMENT UPDATES

DR. KATIE DREW: I'll make this quick. We have a number of assessments going on right now, but I'm only going to provide an update on two that did not have board meetings this week, the River Herring Benchmark Assessment, we're still finalizing the dates for the peer review, but we plan to have that completed by the end of this month, so that it can be presented at the August meeting. Similarly, the sturgeon assessment update is well in progress, and will be ready for presentation at the August meeting as well. Thank you.

CHAIR CIMINO: Any questions for Katie? No, okay, great. Next item on this agenda is Review of Noncompliance Findings. There aren't any, and the good news there means that there will be no intra-business session after this.

OTHER BUSINESS

CHAIR CIMINO: We have two items for Other Business. I'm going to start with Toni Kerns, and then Pat, I'm going to go to you when we talk eel, and actually even on the other one.

LETTERS FOR CONSIDERATION ON BEHALF OF THE AMERICAN LOBSTER BOARD

MS. KERNS: We have two letters for consideration by the Policy Board on behalf of the Lobster Board, and Pat, I will introduce the first letter for you, and then you can talk about the second letter. The first letter was just a consent letter, so we don't have any physical motion on the Board for you all to read. But it's to send a letter to the New England Fishery Management Council highlighting the keys points of the Technical Committee's report on the conduct of

the lobster fishery on the northern edge of Georges Bank.

The Council is considering management action to open to potential areas to the scallop fishery, so the Lobster Technical Committee was tasked to describe the abundance and makeup of the lobster resource on the Georges Bank, and then potential impacts to the scallop gear for that lobster. The additional piece is that we are going to try, if we can, if we can find the available information to provide some economic data for that fishery that is occurring, and provide that to the Council in the letter as well.

CHAIR CIMINO: Cheri.

MS. CHERI PATTERSON: Would it be possible to add into that, any sort of, I'll just say it's possible, any sort of thought about offshore wind and any sort of displacement of gear that may occur in that area in the future, which would also be a consideration for the northern edge?

MS. KERNS: I think that we could express concerns for potential displacement into those areas, whether or not we would have that data available for us now, or we would express the desire to see if the Council can analyze that type of information in that letter, if that is the pleasure of the Board.

CHAIR CIMINO: Dan, you have a comment?

MR. DANIEL McKIERNAN: I would suggest we add a line to the letter that might say that if the lobster fleet is displaced from the area by the scallopers, you know bear in mind there is going to be additional displacement to the offshore lobster fleet when the offshore wind areas are developed. I think conceptually, I think Cheri is on to something that is a second level of stress on that, attributable to displacement on that fleet.

CHAIR CIMINO: Okay, with that addition, any objection by the Policy Board to moving this letter forward? Seeing none. Toni, do you want to introduce the second letter? Go right to Pat. Go ahead, Pat.

MR. KELIHER: Yesterday, I don't know, did you have that language you were going to put up? Yesterday also on, yesterday, several months ago it seems like now, the Lobster Board met to discuss some of the challenges we have with the gauge increase as it pertains to trade with Canada, and some of the timing issues.

A motion was made, which is up on the board right now that was recommended that it be sent to the Policy Board for consideration and approval. I would say, and I would look to the maker of this motion, that we did include in the full last sentence, the letter would request Canada increase the minimum size for lobsters in the Gulf of Maine.

But the trade issue also pertains to lobsters that would come from the Gulf of St. Lawrence as well, so we may want to just be, I'll look to the maker of the motion, but we may want to just be silent on the Gulf of Maine, and just say the minimum size of lobsters on the same schedule as the Commission.

MR. McKIERNAN: I concur with that.

CHAIR CIMINO: Seeing some other heads nod. Any other comments on the fine tuning of this yet? Let's get it up, let's get the motion corrected before we move forward.

MR. KELIHER: I'm being directed to read this. **On behalf of the American Lobster Management Board, move that the Commission to send a letter to Canada DFO and relevant Canadian industry associations, as identified by the Board Chair and the Executive Director**. **This letter would request that Canada increase the minimum size for lobster on the same schedule as ASMFC, or as soon as possible, as captured in Addendum XXVII.**

CHAIR CIMINO: This is moving forward on behalf of the American Lobster Management Board. I see a hand up, Mike Ruccio, go ahead.

MR. MICHAEL RUCCIO: Not to muddy the waters on this. I think as we've discussed before when we've had issues, where the Lobster Board in particular has discussed communications with Canada and DFO. I

would encourage the Lobster Board, certainly you are well within your rights to do as you please on this, but to engage NOAA and our International Trade Group.

We do have regular bilaterals that occur government to government, so however to loop those in, whether they are part of the letter, you might need to review or signatories, or whether they are just kind of looped in as a courtesy. I strongly encourage that. I think it can help in the overall messaging to have multiple fronts of communication on that. Thanks.

CHAIR CIMINO: Yes, go ahead, Pat.

MR. KELIHER: Yes, I appreciate Mike's comments on that, and I don't disagree at all. I'm not sure we need to capture it in the motion itself, as far as the letter is concerned, but I think from a Policy Board perspective, the record could clearly show that we would agree that we need to engage with NOAA on a continuous basis on this issue, as it relates to trade.

CHAIR CIMINO: Yes, I agree as well, and I think that as we continue to update the Lobster Board on this that we will reiterate that cooperation as well. With that; as I mentioned, you know we have a motion before us that doesn't need a second. Is there any further discussion? I see someone who thought better. Any other discussion on this? Okay, **is there any objection to this? Not seeing any, we'll consider this approved by Policy Board by consent**.

LEC UPDATE

CHAIR CIMINO: We do have one other agenda item, and that is the LEC Update. Kurt.

MR. BLANCHARD: I was thinking we might skip that based on time. I will keep it super-fast. We conducted s hybrid meeting this week with the spring meeting. The Committee welcomed Brian Scott of New Jersey Fish and Wildlife as a new LEC Representative from New Jersey, and Captain Scott Pierce, the Florida Fish and Wildlife Conservation Commission, transitioning to the role of Chair of the LEC.

Lieutenant Delayne Brown from New Hampshire Fish and Game was elected the position of Vice-Chair. We covered some species issues, we had discussions on striped bass, Atlantic cobia, spiny dogfish. I won't jump too far into the details on that, and American lobster. We had a really good presentation on the American lobster piece.

The LEC discussed the status of Addendum XXX of Amendment 3 of the lobster plan, this discussion centered around the Mitchell Provision and how the Addendum will interface with Addendum XXVII. The LEC will continue to follow development of this Addendum, and offer comments as appropriate. Some of our general business issues we discussed. We had a presentation on the North American Wildlife Law Enforcement Accreditation Program from John Cobb and Captain Rob Ham from Virginia Department of Wildlife Resources provided a presentation on new wildlife law enforcement accreditation, being implemented through SEAFWA. Created in 2022, NAWLEA offers a comprehensive accreditation program for wildlife law enforcement agencies.

Their team is composed of experts in the field who are dedicated to ensuring the highest standard of professionalism among member agencies. This is a credentialing program that is recognized by the U.S. Department of Justice. We had a good conversation and a good presentation from representatives of the Maine Marine Patrol and the U.S. Fish and Wildlife Service on the status of the elver fishery.

Information was shared about the Canadian elver fishery closure and its impacts on domestic fisheries, some shared success stories were discussed as a deterrent to illegal trade of the side value resource. We also discussed, or continued to discuss the interstate wildlife violators compact. The Committee continued to discuss how best to implement and use the Interstate Violators Compact, specifically state agencies share best practices among each state on how to model their respective programs.
As you know, I've jumped into trying to offer you guys some notable case works that is being done out there, so I'm going to jump through these pretty

quick. A federal grand jury in the District of Puerto Rico returned an indictment February 29, 2024, charging two Dominican nationals for smuggling goods from the United States. He got trafficking and failure to yield too.

During a morning patrol a customs and boarder protection aircraft detected suspicious vessel, approximately 39 nautical miles north of Arecibo, Puerto Rico. The United States Coast Guard responded to intercept the vessel, which was flagless and outfitted for smuggling. On approach, the defendants failed to heave to, obligating the United States Coast Guard to neutralizes the vessel. Strong words there, but yes, they shot up the motors.

The defendants were caught onboard in possession of approximately 22 bags of over 5,000 live American eels per bag that were being transported from Puerto Rico to Dominican Republic. This case is still under investigation through NOAA and U. S. Fish and Wildlife Offices of Law Enforcement and the case is being prosecuted through the Environmental Crime Section of the U.S. Department of Justice, and the U.S. Attorney's Office for the District of Puerto Rico.

Just a side note on this. The case is being prosecuted by the Environmental Crime Section of the U.S. Department of Justice. Wayne Hettenbach sits on our committee; he is such a high-level guy to have as an advisor and consultant in our deliberations. He is invaluable to us. A little closer to home. New Jersey officers charged North Carolina commercial fishing vessel owner and operator, after identifying violations against New Jersey's possession in excess of a daily limit license.

The license allows commercial fishing vessels to enter New Jersey ports with summer flounder and black sea bass that will eventually be landed in other states. The vessel must properly be licensed, and the excess fish must be lawfully landed and sold in the intended state. In this situation, the vessel operator landed a trip limit of New Jersey summer flounder in Cape May, and declares intention for the excess summer flounder onboard to be landed and sold in Virginia. When the vessel left New Jersey, it immediately transited to Massachusetts, landing in New Bedford. Jersey officers contacted Massachusetts authorities, who conducted an inspection of the vessel and determined the excess summer flounder was unlawfully filleted at sea, and concealed in various places onboard. The operator admitted to also discarding an additional amount of excess summer flounder on the way into port.

The vessel captain was also charged in Massachusetts for landing summer flounder without a permit, and for filleting at sea. The final case I would like to highlight, Connecticut Encon police, several regions of the state worked collaboratively to patrol the lower Housatonic River, from November 1st 2023 through April 9, 2024. This area is a known hot spot for striped bass poaching, especially during the winter months.

Fourteen officers voluntarily worked overnight shifts, utilizing Fish and Game detection canines, night vision and surveillance to identify violations to take enforcement action. This enforcement initiative accounted for the following documented activity, $32,343 dollars in fines levied for stripe bass violations, 385 counts of violations of Connecticut striped bass regulations were documented, 374 calls of service, 120 violators were issued an infraction or a warning, and 49 striped bass were located by the Fish and Game detection canine.

Additionally, one offender had his fishing license suspended. This was due to being cited for violations on four previous instances during this initiative. He was caught a fifth time, and charged again with fishing while suspended, along with new striped bass violations. Mr. Chair, that is my brief report. Thank you.

CHAIR CIMINO: Thank you, Kurt, and I'm going to ask a very specific question of the Policy Board here, and that is, do you have any urgent questions or comments? Otherwise, I would strongly encourage if you could reach out to him offline. Loren.

MR. LOREN W. LUSTIG: I'll certainly make this brief. Several examples of what you just said, Sir, related to something that is of concern to me. We've talked in the past about violators considering fines simply a

cost of doing business. Would the example of the person who had his license suspended, if he has been already caught four times, this is the fifth time. Wouldn't we need to increase the pain on that guy, to make sure that there was a cessation of this kind of activity?

MR. BLANCHARD: I appreciate that, Loren. In this particular case, this guy is egregious. He was paying fines of up to $2,000.00 for each of the previous offenses, so it was a cost of doing business. It is my understanding that Connecticut is moving forward with revocation of his privileges.

LETTER FOR CONSIDERATION ON AMERICAN EEL RESOURCE MANAGEMENT

CHAIR CIMINO: We'll move on to Other Business, and Pat, I'm going to start with you, since it was your request to put this item that Mitch brought to us on there. If you can give us a little bit of an intro, and we'll allow Mitch some time as well.

MR. KELIHER: Yes, I'll be brief, and maybe we can try to wrap this up very quickly. Mr. Feigenbaum raised some issues associated with Canada. I want the Policy Board to know that the Maine Department of Marine Resources have been heavily involved with DFO in Canada. We've had them down as guests, both Policy and Law Enforcement at very high levels within DFO, to understand how we manage our elver fishery in Maine.

We've gone over all of our laws and rules with them. I've met with the Fisheries Minister down at the Boston Seafood Show to stress the importance of the totality of these laws and rules, as they exist within the state of Maine, and how they have really helped subside all of the other illegal activities that we have on the east coast.

I think that was highlighted within the Law Enforcement reports that while we're never going to get rid of poaching of eels, the level of poaching up and down the east coast has certainly subsided, and I think our Law Enforcement Committee Rep could verify that. But what we have happening now in Maritime Canada is, what we were seeing when the price spiked in the United States and we didn't have these other rules in place.

I was invited to speak to the Parliament, the Senate Subcommittee Parliament for Fisheries and Oceans. I presented all of the information to them. It is clear that there is interest in trying to move forward within Canada. But I think it is really imperative upon us, as a body, to signal to DFO, in maybe not such an ordinary way that we would encourage them to act as quickly as possible. Because what is happening in Canada is impacting the domestic legal trade of elvers in the United States.

You can clearly see that with the price per pound issue that is being paid in Maine this year. With that, Mr. Chairman, I would recommend sending a letter to the U.S. Embassy in Canada, and to the Ambassador, to keep up to the United States to Canada, and request that he encourage the country to implement rules and regulations that would be protective of the resource, because ultimately this is a resource question. I'm not going to speak to the validity of what some report is saying that Mitch represented, but Maine Marine Patrol is directly engaged with Canada.

We're getting weekly updates on illegal activity there. The Law Enforcement Committee probably heard a lot of details in their closed session, as it pertains to what is happening in Canada, hundreds of arrests, 20 or 30 trucks have been seized. The amount of illegal activity is staggering, far beyond what we probably saw in this country, actually. I think it is imperative that we voice our concerns to them through appropriate channels.

CHAIR CIMINO: Okay, since we're starting off with a motion, I would like to get that motion up. I'll look for a second. I'll keep it for the Board first, Mitch, but I will allow you to speak on this as well. A second from Cheri.

MS. KERNS: Pat, can you help us a little, that was a lot, and so how do you want us to concisely put it in a motion?

MR. KELIHER: I **move to send a letter to the U.S. Ambassador in Canada encouraging Canada to implement rules and laws as quickly as possible, to ensure the protection of the American eel resource.**

CHAIR CIMINO: Cheri are you still okay with that? I realize we haven't gotten it up yet. But as Pat has worded it.

MR. RUCCIO: Mr. Chair, perhaps while they are perfecting the motion, I would make a similar comment, I think, on this level of correspondence. Again, you know I think the Policy Board is well within its rights to communicate how it sees fit. But looping in the federal agency that is a management partner could be of benefit here, so using IATC and just kind of looping in NOAA.

CHAIR CIMINO: Absolutely, thanks Mike. That is acknowledged and agreed to. Pat, do you feel that wording is appropriate here? Cheri, are you seconding this, okay. We have a motion with a second. Any discussion on this motion? I don't see any hands from the Board, so Mitch, do you have any comments? If you do, yes, quickly.

MR. FEIGENBAUM: I do, and it will be very quick. I just wanted to assure the Board that the Ambassador Cohen and his staff have been briefed on this issue. They voted resources to this issue. They have been very receptive to input on this issue. When the industry made a similar request to Ambassador Cohen's staff, please ask the Ambassador to make this outreach, and the response was rather supportive.

Except the fact that such a request really needs to come from official sources, not a constituent, which is why I brought this to my colleagues at ASMFC, including Pat and others. Thank you very much for the consideration. I think this will be a very meaningful step, and I would like to say to Mike, I look forward to meeting him and talking about some of the ways NOAA could actually play a helpful role in this matter as well. Thank you.

CHAIR CIMINO: No, very good, thank you. Not seeing any further hands for comment. Oh, go ahead, Cheri.

MS. PATTERSON: Mike, while I appreciate NOAAs involvement, but should we also be including U.S. Fish and Wildlife Service in that as a partner to this process, considering their management of eels?

CHAIR CIMINO: We'll acknowledge that as looping in our federal partners. With that, I'll just ask. **Is there any objection to this motion for this letter? No seeing any; approved by consent.** Hopefully that covers everything unless there is any other, again, urgent other items to come before the Board. Oh, Bob.

EXECUTIVE DIRECTOR ROBERT E. BEAL: More of a statement than a conversation provoking thing, I hope. We've been notified by a couple states that you may not have received your invoice for the annual Commission dues or appropriations. If your state did not receive that invoice, let us know. They should have been sent out March 29, I believe, but we have been told by a couple states they didn't get them. I don't know if this is part of our e-mail glitch, but if you didn't get yours, let us know. That's all, thanks, Joe.

CHAIR CIMINO: No problem, noted.

ADJOURNMENT

CHAIR CIMINO: With that I would like to adjourn our meeting. As mentioned before, there is no need for a Business Session, thank you.

(Whereupon the meeting adjourned at 12:15 a.m. on Thursday, May 2, 2024.)

ASSOCIATION of FISH & WILDLIFE AGENCIES

The voice of fish and wildlife agencies

1100 First Street, NE, Suite 825
Washington, DC 20002
Phone: 202-838-3474
Fax: 202-350-9869
Email: info@fishwildlife.org

Ms. Naimah Aziz
Division of Management Authority
U.S. Fish and Wildlife Service
International Affairs
5275 Leesburg Pike, MS:IA
Falls Church, VA 22041-3803

Reference: FWS/DMA/FISH 3-21

Dear Ms. Aziz:

Thank you for your letter of May 15, 2024, asking for the Association of Fish and Wildlife Agencies' (Association) preliminary assessment of a potential listing of American eel (*Anguilla rostrata*) in Appendix III pursuant to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

In developing this response, we consulted closely with the Atlantic States Marine Fisheries Commission (ASMFC) since their member agencies are the competent authorities concerning the management and conservation of American eel, in all its life stages.

Through the American Eel Management Board (Board), the ASMFC closely monitors commercial and recreational take of American eel throughout its range on the Atlantic Coast. Based on the most recent Benchmark Stock Assessment (2023), the Board established a new commercial quota for yellow eel (518,281 pounds), and maintained the glass eel quota in Maine (9,688 pounds). Eel harvest for both life stages is closely monitored. Maine's glass eel fishery is highly regulated, including meaningful penalties, to ensure sustainable and legal harvest.

There are two primary concerns about an Appendix III listing that are shared by the Association and ASMFC, which are based on the premise that an Appendix III listing must not have an adverse impact on the managed exports of American eel.

1. Since an Appendix III listing would require the development and implementation of a means of certifying legal acquisition by the competent authorities (the states), and such systems do not currently exist in all jurisdictions, a considerable amount of planning

would be required to ensure minimum disruption of trade. We ask that the USFWS provide the criteria for securing a Legal Acquisition Finding (LAF) for American eel to the Association and the ASMFC. The implementation of any new system may have considerable budgetary implications for the agencies, along with costs imposed on the harvesters. Understanding what a LAF will require is the first step in understanding the budget implications, as well as the process implication for harvest monitoring (e.g. daily electronic vs monthly reporting requirements).

For these reasons, the Association and ASMFC maintain that those legal acquisition systems must be conceptually planned then tested and agreed to prior to an Appendix III listing proposal. We request that the Office of Management Authority work with the Association and ASMFC to develop those concepts in advance of a formal listing proposal.

Moreover, the trade of eels often involves live specimens. Once eels have been packed for export the box cannot be unsealed without undergoing the complete intricate steps of re-packing and eel must be swiftly moved for shipment, or risk mortality. Once sealed most shipments make it to the destination within 36 hours. For this reason, it is crucial that CITES export permits be issued without delay, once a LAF is made. We have concerns regarding the timeliness of permit issuance, and request a discussion with the USFWS about how long they anticipate it taking to issue a permit.

2. The Association and ASMFC request confirmation of the process the USFWS would use to remove American eel from Appendix III if future trade data analysis demonstrates there are no significant conservation status concerns associated with exports of American eel. USFWS has stated it has the regulatory authority to remove any species from Appendix III. However, the criteria to remove them as outlined in the Code of Federal Regulations is that exports are fewer than 5 shipments per year or fewer than 100 individuals. It is our opinion that the criteria are so restrictive American eel would never be removed from Appendix III unless listed in Appendix II. For example, one pound of elvers contains anywhere from 2,000-4,000 individual eels. The Association believes that this is an important policy issue and would like to work collaboratively with the USFWS on resolving it.

In addition, the Association and ASMFC would like to better understand what additional conservation is being accomplished by with an Appendix III listing of American eel. Most US exports are known. The elver fishery, which was worth almost 20 million dollars in 2023 in Maine, is one of the most regulated and monitored fisheries in the country. The Maine elver fishery exports can be tracked back to the harvester through Maine's monitoring program which uses NFC tokens. The ASMFC is concerned a listing, without clarity of what the USFWS will require and advanced agreement on the process to receive a LAF, would significantly harm this highly valuable fishery.

The Association and ASMFC do not recommend the USFWS propose an Appendix III listing until the concerns raised in this letter have been satisfactorily addressed by all parties. We are prepared to engage on short notice to ensure a timely resolution of these issues and we look forward to hearing from you.

Sincerely,

Ryan Brown
AFWA International Relations Committee Co-Chair
Executive Director, Virginia Department of Wildlife Resources

Robert E. Beal
Executive Director ASMFC

Cc: Chuck Sykes, President, Association of Fish and Wildlife Agencies
CITES Technical Work Group

.....

(Original Signature of Member)

118TH CONGRESS
2D SESSION

H. R. _____

To require the Administrator of the National Oceanic and Atmospheric Administration to reform the Marine Recreational Information Program of the National Marine Fisheries Service, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

Mr. GRAVES of Louisiana introduced the following bill; which was referred to the Committee on _____

A BILL

To require the Administrator of the National Oceanic and Atmospheric Administration to reform the Marine Recreational Information Program of the National Marine Fisheries Service, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the ''Fisheries Data Modernization and Accuracy Act of 2024''.

SEC. 2. DEFINITIONS.

In this Act:

(1) ADMINISTRATOR.—The term ''Administrator'' means the Administrator of the National Oceanic and Atmospheric Administration, acting through the Director of the National Marine Fisheries Service.

(2) FISHERY.—The term ''fishery'' has the meaning given the term in section 3 of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1802).

(3) INDEPENDENT ENTITY.—The term ''independent entity''—

(A) means an entity that—

(i) is not a unit of the National Oceanic and Atmospheric Administration; and

(ii) has expertise in areas of science related to fishery stock assessments; and

(B) includes—

(i) the National Academies of Sciences, Engineering, and Medicine; and

(ii) an institution of higher education (as such term is defined in section 101 of the Higher Education Act of 1965 (20 U.S.C. 1001)).

(4) MRIP.—The term ''MRIP'' means the Marine Recreational Information Program of the National Marine Fisheries Service.

(5) NATIONAL ACADEMIES.—The term ''National Academies'' means the National Academies of Sciences, Engineering, and Medicine.

(6) PSE.—The term ''PSE'' means the percent standard error.

(7) PULSE SPECIES.—The term ''pulse species'' means a species that, due to regulatory constraints or the movement or availability of the species on a seasonal basis—

(A) is caught—

(i) on an intermittent or infrequent basis; or

(ii) only during an abbreviated timeframe; and

(B) is likely not sampled in a representative manner by data collected through the MRIP.

(8) REGIONAL FISHERY MANAGEMENT COUNCIL.—The term ''Regional Fishery Management Council'' means a Regional Fishery Management Council established under section 302 of the Magnu-

son-Stevens Fishery Conservation and Management Act (16 U.S.C. 1852).

(9) REGIONAL STATE FISHERIES COMMISSION.—The term ''regional State fisheries commission'' means each of—

(A) the Atlantic States Marine Fisheries Commission;

(B) the Gulf States Marine Fisheries Commission; and

(C) the Pacific States Marine Fisheries Commission.

(10) SCIENTIFIC AND STATISTICAL COMMITTEE.—The term ''scientific and statistical committee'' means a scientific and statistical committee established pursuant to section 302(g) of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1852(g)).

(11) SEASONAL FISHERY.—The term ''seasonal fishery'' means a fishery—

(A) that is subject to an annual closed season; or

(B) that may be affected by in- or post-season accountability measures that result in fishing or harvest closures.

(12) STANDING COMMITTEE.—The term ''standing committee'' means the standing committee established pursuant to section 2(b)(1).

(13) STOCK OF FISH.—The term ''stock of fish'' has the meaning given the term in section 3 of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1802).

(14) WAVE.—The term ''wave'' means the shortest period in which MRIP data are aggregated and reported for use in management decisions.

SEC. 3. RECREATIONAL FISHING DATA COLLECTION REFORM.

(a) IN GENERAL.—The Administrator shall reform the MRIP in effect as of the date of the enactment of this section to meet the unique needs of individual regions and States, taking into consideration the needs of State-level programs related to recreational fishing catch and effort surveys in effect as of the date of the enactment of this section to ensure that such reform does not unnecessarily dilute the effectiveness of such programs.

(b) NATIONAL ACADEMIES.—

(1) STANDING COMMITTEE.—

(A) IN GENERAL.—The Administrator shall enter into an agreement with the National Academies to establish a standing committee

within the National Academies that shall meet regularly to discuss issues related to recreational fisheries data collection and management.

(B) INDEPENDENCE.—In carrying out this subsection, the standing committee shall operate independently and without the influence of the Administrator.

(C) COMPOSITION.—The standing committee shall include individuals who are experts in recreational fisheries data collection and management, including representatives from State fish and wildlife agencies.

(2) CONSULTATION REGARDING PSE.—

(A) IN GENERAL.—If the PSE for data collected through the MRIP for a given seasonal fishery reaches or exceeds 30 percent in a given wave, or if a State submits a petition with respect to a given seasonal fishery under paragraph (4), the Administrator shall consult with the standing committee regarding options—

(i) to reduce the PSE of such seasonal fishery; or

(ii) if reducing the PSE is not practicable, to adjust the management of such seasonal fishery, including by using the management approaches described in section 302(h)(8) of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1852(h)(8)) or multi-year annual catch limits.

(B) REPORT.—After the Administrator consults with the standing committee under subparagraph (A) with respect to a seasonal fishery described in that subparagraph, the Administrator shall, not later than 6 months after the date on which either the PSE for data collected through the MRIP for such seasonal fishery exceeds 30 percent in a given wave or the Administrator receives a petition submitted by a State under paragraph (4), publish a report specifying—

(i) the options considered under that subparagraph (A);

(ii) the recommendation of the Administrator regarding how—

(I) to reduce the PSE for data collected through the MRIP for such seasonal fishery; or

(II) to adjust the management of such seasonal fishery in a manner that allows continued access and considers recommendations contained in the report submitted to Congress under section 102 of the Modernizing Recreational Fisheries Management Act of 2018 (Public Law 115–405); and

(iii) the reasoning, written in a manner easily understood by the public, for giving such recommendation.

(C) REGIONAL FISHERY MANAGEMENT COUNCIL.—If the Administrator publishes a report under subparagraph (B) with respect to a seasonal fishery described in subparagraph (A), the Administrator shall send such report to the relevant Regional Fishery Management Council for consideration.

(3) CONSIDERATION.—In carrying out paragraphs (1) and (2), the Administrator and the

standing committee shall consider issues including the following:

(A) Whether the data collected through the MRIP is appropriate and useful for management decisions, including options to improve data collection methods.

(B) The extent to which existing and potential data collection options are—

(i) burdensome to anglers; and

(ii) an efficient or appropriate use of resources.

(C) Whether and to what extent specific recommendations from the report published by the National Academies titled ''Data and Management Strategies for Recreational Fisheries with Annual Catch Limits'' (2021) and other relevant National Academies activities can and should be applied in light of the particular context of the fishery being considered.

(4) PETITION TO INITIATE CONSULTATION.—A State may submit to the Administrator a petition for the Administrator to initiate the consultation process under paragraph (2) with respect to a given seasonal fishery if—

(A) the PSE for data collected through the MRIP for such seasonal fishery is—

(i) significantly greater or less than the preceding 3-year average PSE for such seasonal fishery; or

(ii) substantially greater than the PSE for data collected through State surveys for such seasonal fishery; or

(B) data collected through the MRIP for such seasonal fishery is unreliable because the stock of fish of such seasonal fishery is—

(i) infrequently encountered through MRIP surveys; or

(ii) a pulse species.

(5) COMBINED REPORTS.—In carrying out this subsection, the Administrator may carry out a single consultation with the standing committee under paragraph (2) with respect to 2 or more species if the Administrator and the standing committee jointly determine the underlying issues that triggered the consultation are highly similar.

(c) RULE OF CONSTRUCTION.—Nothing in this section may be construed to override the role of the scientific and statistical committees in advising the Regional Fish-

ery Management Councils regarding recommendations developed pursuant to this section.

SEC. 4. STATE RECREATIONAL FISHERY CATCH AND EFFORT DATA COLLECTION.

(a) STATE RECREATIONAL FISHERY CATCH AND EFFORT DATA COLLECTION PROGRAM.—

(1) IN GENERAL.—A State may, subject to the approval of the Administrator, carry out a program within the waters of such State and Federal waters to collect recreational fishing catch and effort data for individual, or sets, of species that are federally managed.

(2) REQUIREMENTS.—If a State carries out a program under paragraph (1), the head of such program shall—

(A) ensure that such program complies with paragraph (3);

(B) collect recreational fishery catch and effort data with respect to such State;

(C) report such data that is necessary for Federal management to the Administrator in a manner and timeliness that complies with section 401 of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1881); and

(D) take into consideration the burden of such program to the average angler such that such program is not overly burdensome to the point that substantial noncompliance would be expected.

(3) DATA REQUIREMENTS.—The Administrator, in consultation with the regional State fisheries commissions, shall, with respect to data collected through a recreational fishery catch and effort data collection program of a State carried out under this subsection—

(A) establish universal standards regarding the collection of such data, including ensuring that such standards—

(i) allow for flexibility in the design of such programs to account for differences in recreational fishing activity between States; and

(ii) facilitate the collection of comparable data between States within a region for the purposes of stock assessments and management;

(B) establish such data as the baseline for the calibration of historic estimates of recreational catch; and

(C) use such data to establish catch limits and monitor landings without calibration to any Federal program, including the MRIP.

(4) USE OF STATE DATA.—

(A) IN GENERAL.—Data collected through a State program carried out under this subsection may be used in Federal stock assessments and regulatory actions.

(B) MRIP.—If a State collects data pursuant to this subsection that is collected pursuant to the MRIP, the Administrator shall use the data collected by the State in place of the data collected pursuant to the MRIP.

(5) SUBSEQUENT FUNDING.—Upon approval by the Administrator of a recreational fishery catch and effort data collection program of a State under paragraph (1), funding previously allocated to such State for the collection of recreational fishery catch and effort data through the MRIP shall continue to be allocated to such State for such State to carry out such program of the State.

(b) GRANT PROGRAM.—

(1) IN GENERAL.—Not later than 180 days after the date of the enactment of this section, the Administrator shall establish and carry out a grant

program to award amounts to States to develop, with respect to each such State, a new, or improve an existing, program described in subsection (a).

(2) APPLICATIONS.—To be eligible for a grant under this subsection, a State shall submit to the Administrator an application in such form, at such time, and containing such information as the Administrator determines appropriate.

(3) USE OF FUNDS.—A State that is awarded a grant under this subsection shall use such award—

(A) to support the development or improvement of a program described in subsection (a) of such State;

(B) to enhance the timeliness of reporting by such State of data collected by such State through such program; and

(C) to increase the accuracy and precision of the data collected by such State pursuant to such program.

(4) PRIORITY.—In awarding grants under this subsection, the Administrator shall give priority to applications—

(A) based on the ability of the award to reduce the uncertainty of data collected through the MRIP, including with respect to—

(i) economically or socially important species;

(ii) species a fishery of which is at risk of closure; and

(iii) species a fishery of which is at risk of closing another fishery because the management of both fisheries are intermingled; and

(B) that would alter or improve an existing State program carried out under subsection (a) to meet the requirements under subsection (a)(3).

(c) REPORT.—On the date that is 2 years after the date of the enactment of this section, and biennially thereafter, the Administrator shall submit to the appropriate congressional committees and make publicly available a report regarding the implementation of this section that includes—

(1) the number of States that have participated in the grant program established under subsection (b);

(2) a description of each State recreational fishery catch and effort data collection program;

(3) a description of how the Administrator incorporates data collected pursuant to each such program in fishery stock assessments, fishery management decisions, and catch monitoring; and

(4) an analysis regarding the improvement in data precision and the accuracy of data collected pursuant to each such program compared to data collected through the MRIP.

(d) RULE OF CONSTRUCTION.—Nothing in this section may be construed to negate, uncertify, or otherwise undo existing State programs to collect recreational fishing catch and effort data.

SEC. 5. HEALTHY FISHERIES THROUGH BETTER SCIENCE.

(a) DEFINITION OF STOCK ASSESSMENT.—Section 3 of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1802) is amended—

(1) by redesignating paragraphs (43) through (50) as paragraphs (44) through (51), respectively;

(2) by inserting after paragraph (42) the following:

''(43) The term 'stock assessment' means an evaluation of the past, present, and future status of a stock of fish, including—

"(A) a range of life history characteristics for such stock of fish, including, to the extent practicable—

"(i) the geographical boundaries of such stock of fish; and

"(ii) information regarding age, growth, natural mortality, sexual maturity and reproduction, feeding habits, and habitat preferences of such stock of fish; and

"(B) fishing for the stock of fish."; and

(3) by redesignating the second paragraph (33) as paragraph (52).

(b) STOCK ASSESSMENT PLAN.—

(1) IN GENERAL.—Section 404 of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1881c) is amended by adding at the end the following:

"(f) STOCK ASSESSMENT PLAN.—

"(1) IN GENERAL.—The Secretary shall develop and publish in the Federal Register, on the same schedule as required for each strategic plan required under subsection (b), a plan to conduct stock assessments for priority stocks of fish for which a fishery management plan is in effect under this Act.

''(2) CONTENTS.—Each plan described in paragraph (1) shall—

''(A) for each priority stock of fish for which a stock assessment has previously been conducted—

''(i) establish a schedule for updating the stock assessment that is reasonable given the biology and characteristics of the stock of fish; and

''(ii) subject to the availability of appropriations, require completion of a new stock assessment, or an update of the most recent stock assessment—

''(I) every 5 years; or

''(II) within such other time period specified and justified by the Secretary in the plan;

''(B) for each priority stock of fish for which a stock assessment has not previously been conducted—

''(i) establish a schedule for conducting an initial stock assessment that is reasonable given the biology and characteristics of the stock; and

"(ii) subject to the availability of appropriations, require completion of the initial stock assessment not later than 3 years after the date on which the plan is published in the Federal Register unless another time period is specified and justified by the Secretary in the plan; and

"(C)(i) identify data and analysis, including both data and analysis that is and is not available at the time the plan is prepared, that would reduce the uncertainty, improve the accuracy, and increase the efficiency of future stock assessments; and

"(ii) with respect to data and analysis identified under clause (i), determine whether such data and analysis could be provided by fishermen, fishing communities, universities, and research institutions, to the extent that the use of such data would be consistent with the requirements in section 301(a)(2).

"(3) WAIVER OF STOCK ASSESSMENT REQUIREMENT.—Notwithstanding subparagraphs (A)(ii) and (B)(ii) of paragraph (2), a stock assessment is not required for a stock of fish in the plan described in paragraph (1) if the Secretary determines that such

stock assessment is not necessary and justifies such determination in the Federal Register notice required by this subsection.''.

(2) DEADLINE.—Notwithstanding section 404(f)(1) of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1881c(f)(1)), as added by this section, the Secretary of Commerce shall issue the first stock assessment plan under section 404(f) of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1881c(f)), as added by this section, not later than 2 years after the date of the enactment of this section.

SEC. 6. FISHERY-INDEPENDENT SURVEYS BY INDEPENDENT ENTITIES.

(a) IN GENERAL.—The Administrator shall establish a program to enter into contracts with independent entities on a competitive basis under which such independent entities shall conduct fishery-independent surveys designed to estimate the absolute abundance of stocks of fish included in the Fish Stock Sustainability Index on behalf of the Administrator.

(b) APPLICATIONS.—To be eligible to enter into a contract under the program established under subsection (a), an independent entity shall submit to the Adminis-

trator an application in such form, at such time, and containing such information as the Administrator determines appropriate, including evidence of the following:

(1) Use by the independent entity of modern or cutting-edge science.

(2) The ability of the independent entity to handle data in a reliable manner.

(c) USE OF DATA.—Upon favorable peer review, the Administrator, in consultation with the relevant scientific and statistical committees and independent entity and with consideration of the report submitted under section 7, shall incorporate data collected pursuant to a fishery-independent abundance survey conducted by an independent entity under the program established under subsection (a) in management decisions.

(d) REPORT.—The Administrator shall annually submit to the Committee on Natural Resources of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate a report regarding the findings of surveys conducted pursuant to this section and the incorporation of the results of such surveys in management decisions pursuant to subsection (c).

SEC. 7. REPORT.

Not later than 1 year after the date of the enactment of this section, the National Academies, in consultation

with the Harte Research Institute for Gulf of Mexico Studies, shall submit to the Committee on Natural Resources of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate and make publicly available a report regarding—

(1) the incorporation of the results of the study titled ''Estimating the Absolute Abundance of Age-2+ Red Snapper (Lutjanus campechanus) in the U.S. Gulf of Mexico'' (August 16, 2021) in management decisions of the National Marine Fisheries Service; and

(2) recommendations regarding the incorporation of data collected pursuant to section 6 in management decisions of the National Marine Fisheries Service.

SEC. 8. TRANSPARENCY AND PUBLIC PROCESS.

(a) ADVICE.—Section 302(g)(1)(B) of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1852(g)(1)(B)) is amended by adding at the end the following: ''Each scientific and statistical committee shall develop such advice in a transparent manner and allow for public involvement in the process.''.

(b) MEETINGS.—Section 302(i)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (16

U.S.C. 1852(i)(2)) is amended by adding at the end the following:

"(G) Each Council shall make available on the Internet website of the Council—

"(i) with respect to each meeting of the Council and Council coordination committee established under subsection (l) that is not closed in accordance with paragraph (3), to the extent practicable, a Webcast, live audio recording, or live broadcast of each such meeting; and

"(ii) with respect to each meeting of the Council and of the scientific and statistical committee established by the Council under subsection (g)(1)(A) that is not closed in accordance with paragraph (3), by not later than 30 days after the conclusion of each such meeting, an audio or video (if the meeting was held in person or by video conference) recording or a searchable audio or written transcript of each such meeting.

"(H) The Secretary shall maintain and make available to the public an archive of each recording and transcript made available under subparagraph (G).".

Electronic Monitoring and Reporting Grant Program: 2024 Request for Proposals

Overview for Prospective Applicants

The National Fish and Wildlife Foundation (NFWF) is soliciting proposals for its Electronic Monitoring and Reporting (EMR) Grant Program, which will award grants that catalyze the implementation of electronic technologies (ET) for fisheries catch, effort, and/or compliance monitoring, and improvements to fishery information systems in U.S. fisheries. Examples of past projects funded through the program can be found here. NFWF anticipates awarding up to $4.8 million through this solicitation, with most awards falling between $200,000 and $500,000. Matching contributions from non-federal sources (cash and in-kind) must equal or exceed the requested amount (i.e., a 1:1 match). **Proposals are due on Monday, October 2, 2024 by 11:59 pm ET**. NFWF will host an informational webinar to provide details on this opportunity on Wednesday, July 31, 2024, from 3:00-4:00 pm ET: Register here.

Program Priorities:

The EMR Grant Program is focused on two major priorities:

1) ***Electronic technology in fishery data collection***: Improve reporting and monitoring of fisheries, including but not limited to assisting commercial and recreational fisheries with planning, developing, and executing effective EMR strategies.
2) ***Modernize data management systems*** in order to reduce costs and improve consistency, interoperability, quality, and/or usability of electronically-collected information.

Proposals should address these priorities by either: a) Scaling up proven electronic technologies/data management systems to broaden impacts; or b) Developing, testing, and/or piloting innovative solutions and approaches to known fisheries and data management challenges. ***Note:*** *The EMR Grant Program is not designed to fund ongoing administration of EMR programs to satisfy a fishery's regulatory requirements.*

An additional priority for 2024 focuses on implementing specific ET to collect fishing effort in Gulf of Mexico state-permitted shrimp fisheries. Please contact Gray Redding (gray.redding@nfwf.org) if interested in this new specific priority.

NFWF priority fisheries include the Gulf of Mexico reef fish fishery, the New England groundfish fishery, the West Coast groundfish fishery, and the Alaska halibut/groundfish fisheries; ***however***, other fisheries are fully eligible and have a strong history of receiving funding. If applicable, proposals should explain how projects will address NOAA Fisheries' regional ET priorities as outlined in the ET Regional Implementation Plans.

Eligibility:

- Eligible projects include those focused on U.S. state and federal fisheries, including tribal, commercial, recreational, or for-hire sectors.
- Eligible applicants include non-profit organizations, state government agencies/interstate commissions, local/municipal governments, Tribal governments/organizations, educational institutions, commercial (for-profit) organizations, and international organizations.
- *Ineligible* applicants include U.S. Federal government agencies, including Regional Fishery Management Councils, and unincorporated individuals.

Questions? Contact NFWF's EMR Program Liaison:

NFWF is working with **Willy Goldsmith of Pelagic Strategies** to assist prospective applicants with project scoping, identification of partners, and technical/logistical support through the grant application process. Please reach out to Willy by email at wgoldsmith@pelagicstrategies.com or by phone at (617) 763-3340 with any questions about this grant opportunity or the application process.

Anthropogenic Noise Impacts on Atlantic Fish and Fisheries: Implications for Managers and Long-Term Productivity

Prepared by: ASMFC Habitat Committee

With major contributions from:

R. Grant Gilmore, Jr., Michelle Bachman, Kate M. Wilke, Jessica Coakley, and Claire Enterline

Edited by: Brendan J. Runde

Contents

Report Objective

Many types of human-generated noise impact coastal and marine fishes through disruption of physiological processes and interruption of auditory communication. In turn, fish health and behavior can be affected. These impacts might be short-term or long-term and can lead to changes in spawning aggregations, habitat use, reproductive success, and mortality. The purpose of this report is to summarize the importance of the impacts of anthropogenic noise to fishes managed by the Atlantic States Marine Fisheries Commission.

While there is vast literature on the production and use of sound by marine mammals, including the effects of human-generated sound on these taxa, this is beyond the scope of this report, given ASMFC's fisheries management focus.

I. Introduction

The oceans are full of both natural and anthropogenic sounds. The auditory system is the most important sensory system for many aquatic organisms, including most fishes (Au and Hastings, 2008; Richardson et al., 2013; Staaterman et al., 2014, 2013; Stocker, 2002; Tavolga, 1980, 1960). Because water is denser and more viscous than air, the propagation of light and the diffusion of chemicals in water are both severely inhibited. In contrast, sound can move over four times faster and travel farther with less transmission loss underwater than it can through the air (Rogers and Cox, 1988; Ward, 2015).

Many human activities occurring in coastal and marine habitats add noise to the natural soundscape, and these noises affect aquatic organisms and their interactions with one another (Duarte et al., 2021). For example, as rates of sound production correlate to rates of spawning and reproductive success, any disruptions to the effective communication range for fish and invertebrate species has the potential to reduce reproductive output and recruitment.

This report aims to provide general information about the importance of sound to marine species, the impacts that anthropogenic noise can have on marine species, and the characteristics of natural sounds and anthropogenic noise. This document also describes mitigation measures for certain human-induced noise. Finally, the report provides references to a list of data gaps and research needs to improve our understanding of the impact of noise on marine organisms, including fish.

II. The natural soundscape and its importance to fishes

The natural soundscape of the ocean environment includes abiotic activity such as tectonic

activity, sea surface agitation, and sea ice activity. These sounds range from <10 Hz to >150,000 Hz with varying intensities and intermittency. Ocean waves and tectonic activity produce constant low frequency noises of a moderate intensity, while dramatic seismic events, such as earthquakes or volcanic eruptions, and glacier calving produce relatively short bursts of very loud sounds. Weather, such as precipitation or high wind speeds, contributes to surface agitation causing increased abundance of 100-10,000 Hz noise (Martin et al., 2014; Nowacek et al., 2007; Peng et al., 2015). Sea surface agitation results in secondary sources of noise such as bubbles or spray.

Some fishes and other marine animals produce sound intentionally as part of their communication, reproduction, predator avoidance, foraging, or navigation and orientation (Peng et al., 2015), as well as unintentionally while they move, forage, and release gas (Fine and Parmentier, 2015). Field and laboratory studies of fish physiology and behavior indicate that sound is a preferred sensory mechanism to detect predators or prey, find suitable habitat, orient, migrate, communicate, attract mates, and coordinate spawning (Putland et al., 2018). Not only do many species use sound to locate reproductive partners or indicate reproductive intent (Bass et al., 1997; Lamml and Kramer, 2005; Maruska and Mensinger, 2009; Montie et al., 2017), but some species, like the Pacific marine toadfish *Porichthys notatus*, become more sensitive to certain frequencies of their counterpart's sounds during periods of reproductive availability (Maruska et al., 2012; Sisneros, 2009). Rates of sound production correlate to rates of spawning and reproductive success. Territorial species use aggressive, threatening calls to delineate an individual's territory and intimidate or deter competitors or predators (Ladich, 1997; Maruska and Mensinger, 2009; Vester et al., 2004). Other uses of sound include navigation and orientation, especially for planktonic larval stages of fishes and invertebrates (Radford et al., 2011; Vermeij et al., 2010), avoidance of predators (Hughes et al., 2014; Remage-Healey et al., 2006), communication (Buscaino et al., 2012; Janik, 2014; Van Oosterom et al., 2016), and the determination of suitable habitats for settlement (Simpson et al., 2004).

Soniferous fishes managed by the ASMFC include most prominently members of the family Sciaenidae (e.g., Atlantic croaker *Micropogonias undulatus*, red drum *Sciaenops ocellatus*, and spotted seatrout *Cynoscion nebulosus*). However, evidence also exists of sound production from members of Clupeidae (e.g., Atlantic menhaden *Brevoortia tyrannus* and other shads and herrings), Acipenseridae (e.g., Atlantic sturgeon *Acipenser oxyrhincus*), Moronidae (e.g., striped bass *Morone saxatilis*), Serranidae (e.g., black sea bass *Centropristis striata*), Pomatomidae (e.g., bluefish *Pomatomus saltatrix*), and more (Fish et al., 1952; Fish and Mowbray, 1970; Johnston and Phillips, 2003; Rice et al., 2022; Wilson et al., 2004).

III. Sources of anthropogenic noise in the oceans

Noise generated from human activities covers the full frequency of sound energies used by marine fishes (Duarte et al., 2021). The contribution of human noise to the ocean soundscape has increased over time as activities such as shipping, mineral and oil mining, and coastal construction have grown in scale (Pijanowski et al., 2011). Novel and emerging human activities, such as offshore aquaculture and renewable energy development, also produce noise during construction, operation, maintenance, and eventual decommissioning.

Anthropogenic sources of ocean noise are acute (episodic) and chronic (ongoing or continuous). Both types may occur within estuaries, on the continental shelf, or in open-ocean regions. Acute sources include construction activities such as pile driving, dredging, cable laying, bridge removal, and seismic surveys. Chronic sources include vessel traffic (i.e., commercial and recreational boating and shipping activities) and energy production (e.g., operation of wind turbine generators, or oil and gas extraction).

Below, Figure 1 from Duarte et al. (2021) shows the duration and spatial scale of both natural sounds and anthropogenic noise in the ocean. It also compares the frequencies of marine animal sound production and hearing ranges with anthropogenic noise sources. These visual displays demonstrate that the scale, frequency, and extent of anthropogenic noise overlaps with the activity of marine animals' behavior in different ways.

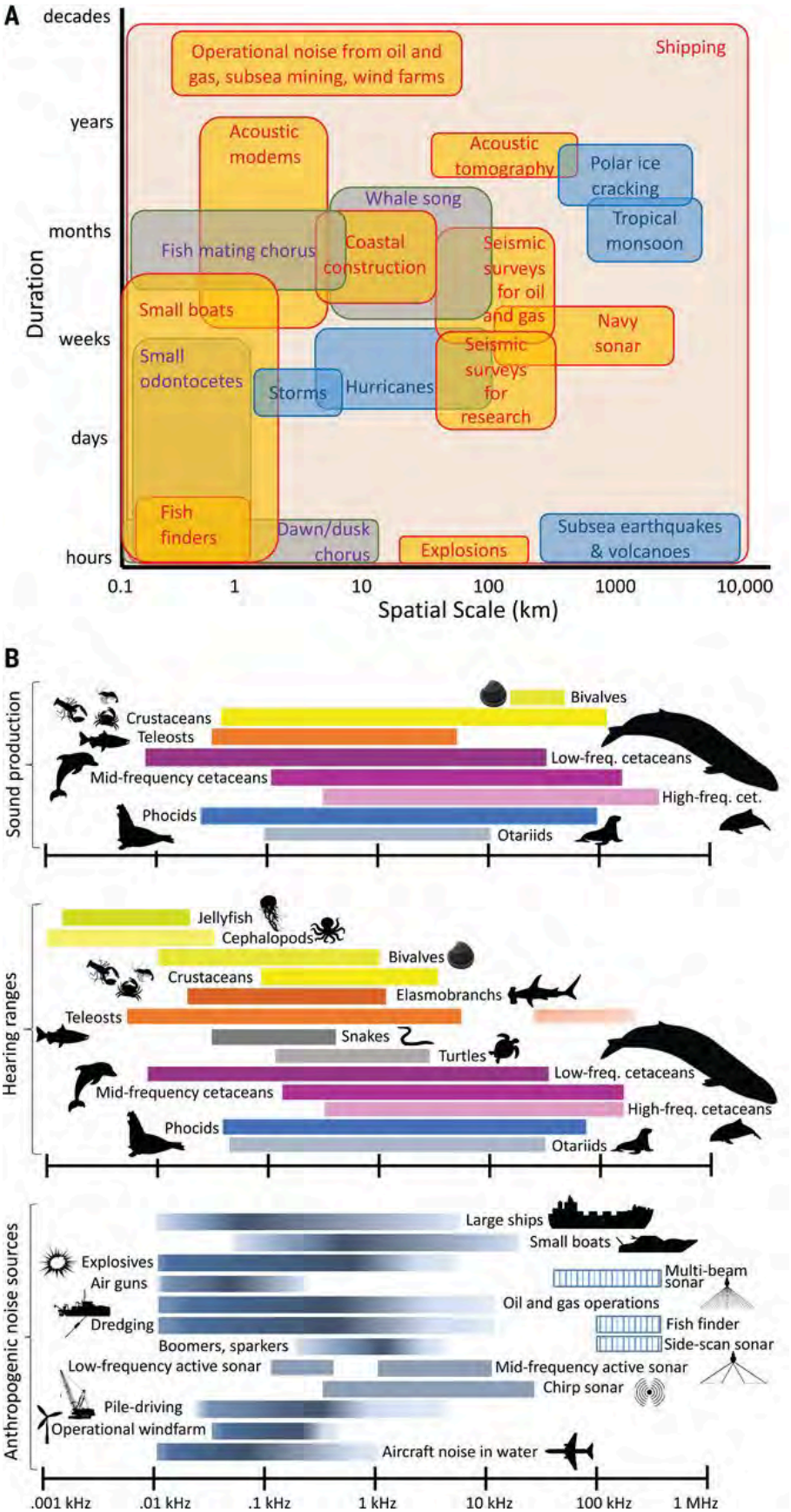

A
decades
years
months
weeks
days
hours
Duration
Operational noise from oil and gas, subsea mining, wind farms
Shipping
Acoustic modems
Acoustic tomography
Polar ice cracking
Whale song
Tropical monsoon
Fish mating chorus
Coastal construction
Seismic surveys for oil and gas
Small boats
Navy sonar
Small odontocetes
Storms
Hurricanes
Seismic surveys for research
Fish finders
Dawn/dusk chorus
Explosions
Subsea earthquakes & volcanoes
0.1
1
10
100
1000
10,000
Spatial Scale (km)
B
Sound production
Bivalves
Crustaceans
Teleosts
Low-freq. cetaceans
Mid-frequency cetaceans
High-freq. cet.
Phocids
Otariids
Hearing ranges
Jellyfish
Cephalopods
Bivalves
Crustaceans
Elasmobranchs
Teleosts
Snakes
Turtles
Low-freq. cetaceans
Mid-frequency cetaceans
High-freq. cetaceans
Phocids
Otariids
Anthropogenic noise sources
Large ships
Small boats
Explosives
Air guns
Multi-beam sonar
Oil and gas operations
Dredging
Fish finder
Boomers, sparkers
Side-scan sonar
Low-frequency active sonar
Mid-frequency active sonar
Chirp sonar
Pile-driving
Operational windfarm
Aircraft noise in water
.001 kHz
.01 kHz
.1 kHz
1 kHz
10 kHz
100 kHz
1 MHz

Figure 1 *(from Duarte et al 2021). Caption reproduced verbatim. (**A**) Stommel diagram showing the spatial extent and duration of selected biophony (rounded gray squares), geophony (rounded blue squares), and anthrophony (rounded yellow squares) events. Events (rounded squares) reflect the spatial and temporal period over which signals or bouts of signals typically occur. Although some sound sources, such as those used in hydrographic surveys, do not propagate particularly far, survey efforts can cover a large spatial extent (an entire Exclusive Economic Zone). "Dawn/dusk chorus" refers to the daily sounds produced by a collection of species (e.g., fish, snapping shrimp). Shipping noise encompasses the full range of spatial and temporal scales. (**B**) Approximate sound production and hearing ranges of marine taxa and frequency ranges of selected anthropogenic sound sources. These ranges represent the acoustic energy over the dominant frequency range of the sound source, and color shading roughly corresponds to the dominant energy band of each source. Dashed lines represent sonars to depict the multifrequency nature of these sounds.*

Vessel Activity

Watercraft of all kinds produce undersea noise and are the most common sources of anthropogenic noise in coastal waters (Stocker, 2002). These sources of noise can be amplified due to surface and seafloor reflections as well as scattering and reverberating because of the geography and geology of the submerged shoreline and bottom. Many watercraft generate low-frequency sound from propeller action, propulsion machinery, generators, and water flow over the hull (Hildebrand, 2005). The sounds generated from a large container vessel can exceed 190 decibels (dB) at the source (Jasny, 1999). Metropolitan areas and ports contain a diverse array of watercraft which constitute the dominant human-derived soundscape: commercial and private fishing boats, recreational watercraft, industrial vessels, public transport ferries, military craft, personal watercraft, and others. Significant underwater sound production can also be generated from bridge automobile traffic, particularly during peak traffic periods.

Additionally, most vessels have sonar systems for navigation, depth sounding, and "fish finding" that may cause acute or episodic noise disturbance. Some commercial fishing boats also deploy various acoustic deterrent devices to prevent negative interactions with dolphins, seals, and turtles (Stocker, 2002). There is little information on the effects of acoustic deterrent devices on fish, however.

Geological and Geophysical Surveys

Geological and geophysical (G&G) surveys are performed to gather information about the seafloor including bathymetry, surficial sediment, sub-surface sediment, and the topology of an area. These surveys are performed for a multitude of uses including resource extraction and wind power siting. Not all G&G surveys produce noise that is known to be within the

hearing range of marine animals.

Sonar systems are used for a wide variety of civilian and military operations. Active sonar systems send sound energy into the water column. Sonar systems can be classified into low (<1,000 Hz), mid (1,000 – 20,000 Hz), and high frequency (>20,000 Hz). Low and mid frequency systems emit sound that overlaps with the acoustic detection of many marine animals. Sub-bottom profilers are a type of high-resolution seismic system that produce imaging of the seafloor's sub-surface. These can be shallow penetration (2–20 m) or deep penetration systems and operate at a wide range of frequencies (400 – 24,000 Hz) and produce varying levels of peak sound (212- 250 dB; (Mooney et al., 2020)). Seismic air guns are used for a deeper penetration of acoustic sound into the seafloor and are used primarily for oil and gas exploration and siting of offshore cables. Air guns generally produce sound at 200-210dB at a range below 100 Hz. While morbidity of fish and other animals has not been associated with air gun exposure, changes in behavior have been observed. Following exposure in a laboratory setting, American lobster *Homarus americanus* changed their feeding levels, and physiological changes were also measured (Payne et al., 2007).

Studies investigating the effect of full-scale G&G surveys on wild fish populations have shown effects in some cases. Atlantic herring *Clupea harengus* schools in the wild were not observed to change their swimming speed, swimming direction, or school size during exposure to a full-scale seismic survey (Peña et al., 2013). However, other studies have found that trawl and long-line fish catches during full-scale G&G surveys decreased within the area of the seismic survey and at ranges of up to 33 km (Engås et al., 1996). When catch rates and behavior were observed to change during seismic surveys, fish were observed to return to the site of the survey within hours or days after the survey completion (Løkkeborg et al., 2012).

High frequency sonar telemetry is associated with vessel positioning, locating, steering, and remotely operated vessel control. Ultrasonic frequencies (generally 200,000 - 400,000 Hz), also known as multibeam echosounders, are used for sonar mapping. Multibeam echosounder surveys collect bathymetry and seafloor hardness information used for nautical chart updates, benthic habitat characterizations, fisheries habitat modeling, and surficial sediment analysis. These ultrasonic frequencies are generally outside of the known range of acoustic detection by marine animals.

Renewable Energy Construction & Operation

Renewable energy is a growing segment of the United States' electrical generation portfolio as we attempt to combat climate change and become more energy secure (Chow et al., 2003; Dincer, 1999; Pimentel et al., 2002; Valentine, 2011). While the nation's renewable energy

portfolio has to date been mainly composed of land-based technologies, coastal and marine energy sources in the form of tides, currents, waves, and especially offshore wind have the potential to provide a large amount of energy to the future power grid (Pelc and Fujita, 2002). These energy sources are not without impacts to marine fish welfare, movements, and behavior. The impacts of offshore wind development on the marine environment have been widely discussed in recent years, and monitoring of wind farms in Europe has generated some knowledge about long-term effects (e.g., Gimpel et al., 2023; Stenberg et al., 2015), from which we along the U.S. Atlantic coast can learn. Along the U.S. Atlantic only a handful of projects are built or currently under construction, although many more have been or will soon be permitted. The effects of offshore wind farms on this ecosystem are just beginning to be examined, thus it is likely we will learn more as construction continues and additional projects enter the operational phase. The impact of noise produced by wind farms can occur during construction, operation, maintenance, and decommissioning.

Of the studies performed to assess these impacts, construction noise, specifically pile driving, has produced high levels of sound pressure and acoustic particle motion in the water column and seabed (Nedwell and Howell, 2004; Thomsen et al., 2006; Tougaard et al., 2012). During pile driving for offshore wind construction, the broadband peak sound pressure level has been measured at 189 dB at 400 m and a modeled level of 228 dB at 1m with a dominant frequency of 315 Hz, however these levels depend on the size of the piles (Thomsen et al., 2006; Tougaard et al., 2012). These noise levels are within the perception ranges of Atlantic cod *Gadus morhua*, dab *Limanda limanda*, Atlantic salmon *Salmo salar*, and Atlantic herring *Clupea harengu*s (Thomsen et al., 2006). Documented behavioral reactions in Atlantic cod and sole *Solea solea* were observed up to tens of kilometers from the source (Andersson, 2011).

Planned wind turbine generator capacities are increasing, which will require ever larger pile sizes. Alternative foundation types such as gravity based or suction buckets reduce installation noise substantially, but these are less commonly proposed for U.S. east coast projects. To date, most offshore wind installations worldwide have used fixed turbines. Floating offshore wind technology, which will have substantially reduced installation noise and is required for deeper waters, is in its nascent stages (although sites that would require floating technology have been leased along the U.S. west coast) and thus little is known about differences in operational noise between floating and fixed turbines. There is some evidence that jacketing monopile turbines reduces the chronic noise from operation (Thomsen et al., 2015), however to date, actual noise levels emitted by floating platforms has not been documented. As this technology advances, there is a need to determine the noise levels and frequencies which different floating platform types emit and at what distances.

Operational noise at offshore wind farms includes sound produced by both the turbines (Tougaard et al., 2020) and increased vessel traffic (Nedwell and Howell, 2004). Underwater sound produced by turbine operation is generated by the moving mechanical parts within the nacelle (i.e., turbine housing) as well as possible wind-induced vibration of the tower (Tougaard et al. 2020). Operational noise of a 1.5MW turbine (at 110m distance) has been measured between 120 – 142 dB with dominant frequencies at 50, 160, and 200 Hz at wind speeds of 12 m/s (Thomsen et al., 2006). Distance from the noise source, wind speed, and turbine size all impact noise levels measured during turbine operation (Tougaard et al. 2020). Also, vessel noise in the Tougaard et al. (2020) analysis was louder than that of turbines, but distance from the noise source varied as did turbine size (max turbine size was 6MW). Noise produced during wind turbine operation was found to be detectable at a distance of several kilometers by fishes sensitive to sound pressure, however species sensitive to motion (as opposed to pressure) were found to be affected within only tens of meters (Andersson, 2011). It is estimated that operational noise of wind turbines is within the perception range of Atlantic cod and herring up to a distance of approximately 4 km, while for dab and Atlantic salmon up to 1 km (Thomsen et al., 2006).

Oil, Gas, and Mineral Extraction

Some of the loudest anthropogenic noises are generated by marine extraction industries such as oil drilling and mineral mining (Stocker, 2002). The most common source of sounds is from air guns used to create and read seismic disturbances (Hawkins and Popper, 2016; Popper et al., 2014, 2005; Popper and Hastings, 2009). Air guns are used to generate and direct huge impact noises into the ocean substrate. The sound pressure wave created aids in reflection profiling of underlying substrates for oil and gas exploration. Peak source sound levels typically are 250-255 dB. Following the exploration stage; drilling, coring, and dredging are performed during extraction.

Resource extraction in marine waters produces chronic noise disturbance including from vessel noise (the impacts of vessel noise are described above); noise is also produced by the operation of extraction machinery, depending on platform type. Spence (2007) reviewed research on noise generated by oil and gas extraction found that fixed platforms had lower underwater radiated noise levels than floating platforms, and gravel islands appear to have the lowest source levels of any oil and gas industry activity. Semisubmersible platforms were found to generate the most underwater noise, which was highest when thrusters were operating and drilling was occurring. Levels were measured at 20-50+ dB in the frequency range of 20 – 1000 Hz during drilling operations, with the dominant frequencies at 130, 200, 350, and 600 Hz (Spence, 2007). On all platform types, noise from large power generation equipment is likely to be a dominant cause of underwater noise, for example from the operation of turbines, compressors, and large pumps (e.g., mud pumps). This noise is

thought to be more significant when equipment is hard mounted directly to the platform (Spence, 2007).

Coastal and Marine Construction

Inshore industrial and construction activities drastically alter the aquatic soundscape and have caused documented mortality and severe behavioral change in fishes and other marine animals. Underwater blasting with explosives is sometimes used for dredging new navigation channels in rocky substrates, decommissioning and removing bridge structures and dams, and construction of new in-water structures such as gas and oil pipelines, bridges, and dams. The potential for injury and death to fish from underwater explosives has been well-documented (Hubbs and Rechnitzer, 1952; Keevin et al., 1999; Linton et al., 1985; Teleki and Chamberlain, 1978). Moreover, some construction (including that related to offshore wind) requires pile driving. This typically occurs at frequencies below 1000 Hz, and has been documented to cause negative or disruptive physiological and behavioral effects on fish (Mueller-Blenkle et al., 2010), including Atlantic cod (Thomsen et al., 2012) and sturgeons (Popper and Calfee, 2023).

IV. Impacts of anthropogenic noise on fishes

Sound energy is transmitted through both sound pressure and water particle motion. Thus, to understand whether and how noises are likely to impact fishes, it is necessary to understand their sensitivity to both sound pressure and particle motion. Fishes have very complex and diverse interactions with sound and how they perceive it. Hearing systems and capabilities vary based on anatomy, including presence of a swim bladder or other gas-filled organs and position relative to the inner ear, as well as other factors (Popper and Hawkins, 2018). Sensitivity varies by species and among larval, juvenile, and adult stages (Wright et al., 2010). Many species have the same hearing frequency sensitivity that humans do (10 to 20,000 Hz; (Fay, 2009; Fine, 1977a; Popper and Fay, 2011; Popper and Hastings, 2009; Tavolga, 1960, 1980), and most fish produce sounds below 200,000 Hz (Fay, 2009; Fine, 1977a; Tavolga, 1960, 1980). Sound frequencies below 100,000 Hz scatter and dissipate least, travel farthest underwater (Au and Hastings, 2008; Popper and Fay, 2011; Wenz, 1962), and are used for communication among fishes (Au and Hastings, 2008; Bass et al., 1997; Popper and Fay, 2011). Certain groups of fish, such as *Clupeidae* (herrings, shad, sardines, and menhaden), can detect ultrasound frequencies above 100,000 Hz (Fine, 1977b; Mann et al., 2001, 1997; Narins et al., 2013; Nestler et al., 1992), however the strongest response has been documented at 40,000 Hz (Wilson et al., 2009).

The frequency at which different species perceive sound is highly variable (Monczak et al., 2017), however for most fishes, sound production and habitat soundscape acoustic

signatures are at frequencies below 5,000 Hz (Fish and Mowbray, 1970; Myrberg and Fuiman, 2002). For example, black drum (*Pogonias cromis*) were found to have the highest neurological response to sounds at 82, 166, and 249 Hz (Monczak et al., 2017). This is also the range of frequencies where underwater sound propagates best. Most human-generated chronic noise is below 5,000 Hz (Au and Hastings, 2008; Richardson et al., 2013), which is of concern as fish are very sensitive to intense sounds below 1,000 Hz.

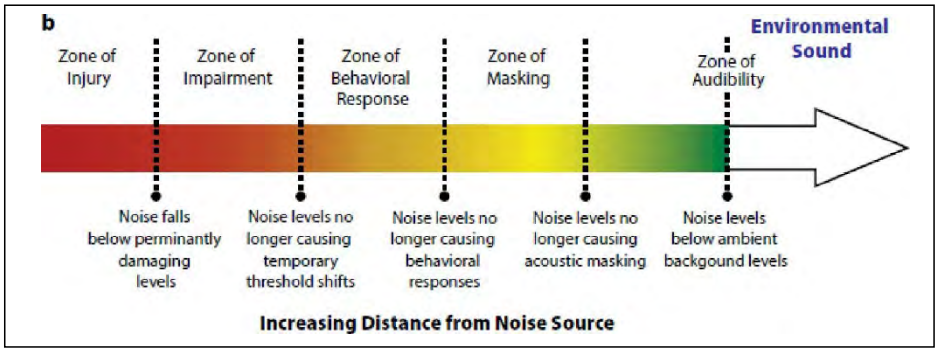


Figure 2. The potential effects of noise with distance from source. Generally, noise and impact on individual animals may be greater closer to the source. Effects change with increasing distance from the source because acoustic signals change, for example decreased dB. Figure from Mooney et al. 2012, modified from Dooling and Blumenrath (2013).

Particle Motion versus Sound Pressure

Although there is growing evidence that fish and invertebrates are sensitive to the particle motion caused by underwater noise (Casper and Popper, 2010; Hawkins and Popper, 2017; Mooney et al., 2020, p. 201; Mueller-Blenkle et al., 2010; Nedelec et al., 2016; Popper and Hawkins, 2018; Solé et al., 2017), particle motion itself is technically challenging to measure. This difficulty has led to poor assessments of the impacts of particle motion on fish and invertebrates (Popper and Hawkins, 2018). There is more information and research on effects of sound pressure in bony fishes and to a lesser extent invertebrates. As such, much of the information below describes the impact of sound pressure.

Physiological Effects

Physiological impacts of sound to fish include damage to ear, nerve, and lateral line tissue that can lead to sound sensing loss or threshold shifts in hearing (Hastings and Popper, 2005; Heathershaw et al., 2001; Jasny, 1999). Threshold shifts result from exposure to low levels of sound for a relatively long period of time or high levels of sound for shorter periods, which may be temporary or permanent. Recovery from threshold shifts appears to require more time for fish species that vocalize (Amoser and Ladich, 2003). Threshold shifts can impact a fish's ability to carry out its life functions. Any organ with a markedly different density than seawater (e.g., swim bladder) may be susceptible to pressure-related impacts. Some of the

resulting effects on fish include rupturing of organs and death (Hastings and Popper, 2005).

Near field (close proximity) percussion events produced by pile driving and explosions can have a lethal impact on fish through particle motion and sound wave compression. However, the distance from the disturbance and environmental setting (water density, turbulence, etc.) undoubtedly has major influences on potential physiological effects from particle motion and need further study before they can be treated in detail (Keevin et al., 1999; Thomsen et al., 2015). The lethality of underwater blasts on fish is dependent upon the intensity of the explosion; however, a number of other variables may play an important role including the size, shape, species, and orientation of the organism to the shock wave; the amount, type, and detonation depth of explosive; water depth; and bottom type (Linton et al., 1985).
Fish with swim bladders are the most susceptible to underwater blasts due to the effects of rapid changes in hydrostatic pressures on this gas-filled organ. The kidney, liver, spleen, and sinus structures are other organs typically injured after underwater blasts (Linton et al., 1985). Smaller fish are more likely to be impacted by the shock wave of underwater blasts than are larger fish, and eggs and embryos tend to be particularly sensitive (Wright and Hopky, 1998). However, early fish larvae tend to be less sensitive to blasts than eggs or post-larval fish, probably because the larval stages do not yet possess swim bladders (Wright and Hopky, 1998). Cephalopods can experience significant trauma to their statocysts, structures necessary for balance and position, at cellular and subcellular levels (André et al., 2011). Additionally, playback of seismic air gun recordings induced delayed development and malformation of New Zealand scallop larvae (De Soto et al., 2013).

Effect of anthropogenic noise on zooplankton is a relatively recent topic of interest, tangential to the main subject of the paper but relevant as physiological impacts to zooplankton indirectly affect fishes since many species feed on zooplankton. Abundance of dead larval and adult zooplankton increases two to threefold within one hour after passage of an active seismic air gun; elevated mortality extended at least 1.2 km from the air gun signal (McCauley et al., 2017). Simulations based on these findings estimate a 22% reduction of zooplankton population within the survey area and declining to 14% within 15 km and 2% within 150 km (Richardson et al., 2017, p. 201). In contrast, the copepod *Calanus finmarchicus* was only negatively affected when in close proximity (≤ 10 m) to an active seismic air gun (Fields et al., 2019).

Anthropogenic noise that falsely trigger fish responses may cause animals to expend energy without benefit (Stocker, 2002). Masking biologically significant sounds may compromise feeding, spawning, community bonding, and schooling synchronization. For species in which males broadcast calls to attract females to a spawning location (e.g., oyster toadfish *Opsanus tau*, silver perch *Bairdiella chrysoura*, black drum *Pogonias cromis*, spotted

seatrout *Cynoscion nebulosus*, red drum *Sciaenops ocellatus*), masking of these acoustic signals by noise may interfere with reproduction (Smott et al., 2018). Further, the effect of noise on each of these behaviors is compounded when considering that the behaviors are inter-related; for example, a change in the ability or desire to feed compounded with reduced communication may lead to a more severe reduction in spawning success.

Behavioral response of fishes to noise is varied and dependent on the species sound perception and the characteristics of the source of noise. While not a comprehensive list, the following provide some examples of behavioral responses.

- When exposed to noise from piling installation, Atlantic cod initially responded by freezing in place. Following the initial onset of noise, Atlantic cod and sole increased swimming speed for the duration of the piling installation activity. In contrast, other fish species appeared to habituate to the repetitive noise (Andersson, 2011).
- Elasmobranch species that are more active swimmers appear to be more sensitive to sound than more sedentary species. Elasmobranchs have been shown to be sound curious, often seeking out the source. Sudden noises that are ~20-30 dB above ambient sound can induce a startle response, but habituation over time has been known to occur (Casper and Popper, 2010).
- Turbine and tidal turbine noise can obscure sounds associated with mudflats resulting in delayed metamorphosis of estuarine crabs (Carroll et al., 2017).
- Increased ambient noise created by watercraft activity potentially reduces the ability of marine organisms, particularly larval forms, to receive the appropriate sound cues to settle in critical habitats (Hastings and Popper, 2005; Holles et al., 2013; Jasny, 1999; Lillis et al., 2016; Scholik and Yan, 2002; Simpson et al., 2016; Staaterman et al., 2014; Stanley et al., 2012).

Cumulative Effects

The most chronic and pervasive impacts on regional fish stocks occur when human generated sounds cause behavioral changes that affect critical life history activities required to maintain healthy populations. Several studies have indicated that increased background noise and sudden increases in sound pressure can lead to elevated levels of stress in many fish species (Hastings and Popper, 2005). Chronic noise levels ≥123 dB can elicit physiological (weight loss, decreased condition, and elevated and variable heterophil:lymphocyte ratio), behavioral (increased piping and tail adjustments and reduced stationarity), and vocal (increased clicking) stress responses in the lined seahorse *Hippocampus erectus* (Andersson, 2011). Similarly, Southern Australia scallops *Pecten fumatus* exposed to seismic air gun signals resulted in altered physiology (hemolymph biochemistry) and behavior (development of a flinch response and increased recessing

reflex) which intensified with repeated exposure (Day et al., 2017).

These examples, as well as others described in this report, demonstrate that noise impacts key life events (e.g., foraging, navigation, and spawning) in many species. This can produce cumulative impacts at many scales. For instance, individual animals that experience repeat exposure to acute noise impacts or experience chronic noise are most likely to have cumulative physiological impacts that reduce their individual fitness. Yet, population level impacts may occur if the acute or chronic noise impacts spawning aggregations or behavior over multiple occasions or locations. Either of these scenarios could lead to population level effects over time if, for example, spawning success or aggregations are interrupted. Examining these cumulative impacts at a range of scales is a priority for future research, especially as sound-producing ocean uses – including offshore wind construction – continue to intensify.

Effects on Biogenic Habitats

Alteration of the soundscape has the potential to impact biogenic fish habitats. Eastern oyster *Crassostrea virginica* larval settlement increased in the presence of oyster reef habitat sounds (Lillis et al., 2013). In response to sediment vibrations, blue mussel *Mytilus edulis* respiration rates decreased resulting in altered valve gape, oxygen demand, and waste removal (Roberts et al., 2015). Unlike shellfish, Scleractinian corals appear resistant to soft tissue and skeletal damage after repeated exposure to a 3D seismic survey (Heyward et al., 2018). Seagrass meadows, which provide not only a structural habitat for species to forage and avoid predators, but also act as an acoustic refuge for prey species including fishes by attenuating high frequency sounds (100,000 Hz) such as those used by bottlenose dolphin *Tursiops truncatus* (Wilson et al., 2013), may be impacted by noise. Submerged aquatic vegetation exposed to low frequency sounds (50-400 Hz at 157 ± 5 dB re 1 μPa^2) can develop physical damage to root and rhizome cellular structures, specifically amyloplasts responsible for starch production and storage, gravity sensing, and vibration reception (Solé et al., 2021).

Effects on Fisheries Catch Rates

Anthropogenic noise has been demonstrated to affect catch rates. Several studies indicate that catch rates of fishes decreased in areas exposed to seismic air gun blasts (Engås et al., 1996; Hastings and Popper, 2005); abundance and catch rates for Atlantic cod *Gadus morhua* and haddock *Melanogrammus aeglefinus* did not return to pre-disturbance levels during the five-day monitoring period (Engås et al., 1996). These results imply that fish relocate to areas beyond the impact zone (area of highest sound intensity), which have been corroborated with visual studies on fish abundance before and after seismic surveys (Paxton et al., 2017). One study indicated that catch rates increased 30-50 km away from the noise source, implying

that redistribution of fish populations may occur over broad areas (Hastings and Popper, 2005). Seismic surveys may have positive, no change, or negative effect on fishery catch rates due to variable responses among fish species such as no response, dispersal, avoidance, and decreased responsiveness to bait (Carroll et al., 2017). While fish abundance can decrease due to increased anthropogenic noise, such as from wind farm operation, it is unclear the extent to which the increased noise from wind farm operation affects individual behaviors (Mooney et al., 2020).

V. Mitigation

When noise cannot be avoided, measures could be implemented to mitigate certain anthropogenic acoustic impacts. New technologies continue to emerge that reduce vessel noise, rendering them less acoustically intrusive. For instance, the use of alternative propeller designs and propulsion systems such as diesel-electric hybrid, electric motors, liquid natural gas pumps, and rotor sails that are quieter than internal combustion engines can be employed. Ship generators are also a substantial source of vessel noise. Insulated or sound proofed ship hulls may be used aboard ships with generators to further reduce acoustic impacts. Furthermore, when in port, vessels could power down their generators and connect to onshore power systems when possible.

In addition to modifying hardware and ship practices, informed marine spatial planning can be used to manage location and timing of when harmful sounds are generated. Acoustic transects can be used to isolate and map specific sites based on sound production of fishery aggregations (Gilmore et al., 2003; Gilmore Jr, 1994; Luczkovich et al., 1999; Rountree et al., 2002) as well as the broader ambient soundscape (Chou et al., 2021). For example, critical spawning and aggregation sites can be designated as off limits to vessels, dredging, seismic, construction, and other sound generating activities at night which is when spawning chorus events typically occur. These sites can be remotely monitored with vessel tracking technologies such as automatic identification systems (AIS) to identify violating vessels. To mitigate episodic noise impacts, such as from offshore construction, seasonal restrictions on activities could be combined with spatial planning.

Novel seismic survey methods, including higher sensitivity hydrophones, benthic stationary fiber-optic receivers, parabolic reflectors, and non-impulsive, very low frequency marine vibroseis, may reduce the potential detriment caused by these activities (Chou et al., 2021). Continued study of these technologies and their relative impact on marine life should be prioritized.

The construction of some infrastructure types, including offshore wind turbine foundations,

generally involves pile driving at present. However, other foundation types including "quiet" technologies such as pulse prolongation, vibropiling, foundation drilling, gravity base foundation, suction bucket jacket, mono bucket foundation, and floating foundations, are all potentially viable alternatives (Koschinski and Lüdemann, 2020). When possible, one or more sound dampening measures such as bubble curtains, isolation casings, hydro sound dampers, dewatered cofferdams, and double/mandrel piles should be used in conjunction with pile driving.

Multiple sound exposure level metrics such as cumulative, peak, single-strike, and number of strikes should be considered when evaluating the potential effect of pile driving and other impulsive sounds and establishing allowable exposure criteria (Halvorsen, 2011). Furthermore, deterrence strategies such as soft-start and ramp-up are intended to scare away mobile species as noise levels are gradually increased (Andersson, 2011; Chou et al., 2021). Each of these are areas for continued research to better inform best practices, exposure criteria, and noise thresholds.

VI. Data gaps and research needs

There are still many unknowns about the impact of anthropogenic noise on the physiology and behavior of fishes. Some of these include species-specific effects, the impact on fishing catch rates, synergistic impacts of multiple sources of anthropogenic noise, and many other questions. In 2020, the New York State Energy Research and Development Authority (NYSERDA) convened a working group of over 40 stakeholders and experts who identified and prioritized data gaps and research needs specific to the effects of sound and vibration on fishes and invertebrates (Popper et al., 2021). We direct the reader to this document for more information on research needs.

References

Amoser, S., Ladich, F., 2003. Diversity in noise-induced temporary hearing loss in otophysine fishes. The Journal of the Acoustical Society of America 113, 2170–2179. https://doi.org/10.1121/1.1557212

Andersson, M.H., 2011. Offshore wind farms-ecological effects of noise and habitat alteration on fish.

André, M., Solé, M., Lenoir, M., Durfort, M., Quero, C., Mas, A., Lombarte, A., Van Der Schaar, M., López-Bejar, M., Morell, M., Zaugg, S., Houégnigan, L., 2011. Low-frequency sounds induce acoustic trauma in cephalopods. Frontiers in Ecology & Environment 9, 489–493. https://doi.org/10.1890/100124

Au, W.W.L., Hastings, M.C., 2008. Principles of Marine Bioacoustics. Springer US, New York,

NY. https://doi.org/10.1007/978-0-387-78365-9

Bass, A.H., Bodnar, D.A., McKibben, J.R., 1997. From neurons to behavior: vocal-acoustic communication in teleost fish. The Biological Bulletin 192, 158–160. https://doi.org/10.2307/1542593

Buscaino, G., Filiciotto, F., Buffa, G., Di Stefano, V., Maccarrone, V., Buscaino, C., Mazzola, S., Alonge, G., D'Angelo, S., Maccarrone, V., 2012. The underwater acoustic activities of the red swamp crayfish *Procambarus clarkii*. The Journal of the Acoustical Society of America 132, 1792–1798. https://doi.org/10.1121/1.4742744

Carroll, A., Przeslawski, R., Duncan, A., Gunning, M., Bruce, B., 2017. A critical review of the potential impacts of marine seismic surveys on fish & invertebrates. Marine Pollution Bulletin 114, 9–24.

Casper, B.M., Popper, A.N., 2010. Anthropogenic noise: Is this an issue for elasmobranch fishes? The Journal of the Acoustical Society of America 127, 1753–1753. https://doi.org/10.1121/1.3383688

Chou, E., Southall, B.L., Robards, M., Rosenbaum, H.C., 2021. International policy, recommendations, actions and mitigation efforts of anthropogenic underwater noise. Ocean & Coastal Management 202, 105427.

Chow, J., Kopp, R.J., Portney, P.R., 2003. Energy resources and global development. Science 302, 1528–1531.

Day, R.D., McCauley, R.D., Fitzgibbon, Q.P., Hartmann, K., Semmens, J.M., 2017. Exposure to seismic air gun signals causes physiological harm and alters behavior in the scallop *Pecten fumatus*. Proceedings of the National Academy of Science U.S.A. 114. https://doi.org/10.1073/pnas.1700564114

De Soto, N.A., Delorme, N., Atkins, J., Howard, S., Williams, J., Johnson, M., 2013. Anthropogenic noise causes body malformations and delays development in marine larvae. Scientific Reports 3, 2831. https://doi.org/10.1038/srep02831

Dincer, I., 1999. Environmental impacts of energy. Energy policy 27, 845–854.

Duarte, C.M., Chapuis, L., Collin, S.P., Costa, D.P., Devassy, R.P., Eguiluz, V.M., Erbe, C., Gordon, T.A.C., Halpern, B.S., Harding, H.R., Havlik, M.N., Meekan, M., Merchant, N.D., Miksis-Olds, J.L., Parsons, M., Predragovic, M., Radford, A.N., Radford, C.A., Simpson, S.D., Slabbekoorn, H., Staaterman, E., Van Opzeeland, I.C., Winderen, J., Zhang, X., Juanes, F., 2021. The soundscape of the Anthropocene ocean. Science 371, eaba4658. https://doi.org/10.1126/science.aba4658

Engås, A., Løkkeborg, S., Ona, E., Soldal, A.V., 1996. Effects of seismic shooting on local abundance and catch rates of cod (*(Gadus morhua)* and haddock *)(Melanogrammus aeglefinus)*. Canadian Journal of Fisheries and Aquatic Sciences 53, 2238–2249. https://doi.org/10.1139/f96-177

Fay, R., 2009. Soundscapes and the sense of hearing of fishes. Integrative Zoology 4, 26–32.

https://doi.org/10.1111/j.1749-4877.2008.00132.x
Fields, D.M., Handegard, N.O., Dalen, J., Eichner, C., Malde, K., Karlsen, Ø., Skiftesvik, A.B., Durif, C.M.F., Browman, H.I., 2019. Airgun blasts used in marine seismic surveys have limited effects on mortality, and no sublethal effects on behaviour or gene expression, in the copepod *Calanus finmarchicus*. ICES Journal of Marine Science 76, 2033–2044. https://doi.org/10.1093/icesjms/fsz126
Fine, M.L., 1977a. Communication in fishes: How animals communicate, pp. 472–518.
Fine, M.L., 1977b. Temporal aspects of calling behavior in oyster toadfish, *Opsanus-tau*. Fishery Bulletin 75, 871.
Fine, M.L., Parmentier, E., 2015. Mechanisms of fish sound production, in: ladich, f. (ed.), sound communication in fishes, animal signals and communication. Springer Vienna, Vienna, pp. 77–126. https://doi.org/10.1007/978-3-7091-1846-7_3
Fish, M.P., Kelsey Jr, A.S., Mowbray, W.H., 1952. Studies on the production of underwater sound by North Atlantic coastal fishes.
Fish, M.P., Mowbray, W.H., 1970. Sounds of western North Atlantic fishes: A reference file of biological underwater sounds. Johns Hopkins Press Baltimore.
Gilmore, G.R., Clark, A.M., Cooke, J., 2003. Technologies for sustained biological resource observations with potential applications in coastal homeland security. Marine Technology Society Journal 37, 134–141. https://doi.org/10.4031/002533203787537159
Gilmore Jr, R., 1994. Environmental parameters associated with spawning, larval dispersal, and early life history of the spotted seatrout, *Cynoscion nebulosus* (Cuvier), Final Program Review Contract No. LCD 347.
Gimpel, A., Werner, K., Bockelmann, F.-D., Haslob, H., Kloppmann, M., Schaber, M., Stelzenmüller, V., 2023. Ecological effects of offshore wind farms on Atlantic cod (*Gadus morhua*) in the southern North Sea. Science of the Total Environment 878, 162902.
Halvorsen, M.B., 2011. Hydroacoustic impacts on fish from pile installation. Transportation Research Board.
Hastings, M.C., Popper, A.N., 2005. Effects of sound on fish. California Department of Transportation.
Hawkins, A.D., Popper, A.N., 2017. A sound approach to assessing the impact of underwater noise on marine fishes and invertebrates. ICES Journal of Marine Science 74, 635–651. https://doi.org/10.1093/icesjms/fsw205
Hawkins, A.D., Popper, A.N., 2016. Developing sound exposure criteria for fishes, in: Popper, A.N., Hawkins, A. (Eds.), The effects of noise on aquatic life II: Advances in experimental medicine and biology. Springer New York, New York, NY, pp. 431–439. https://doi.org/10.1007/978-1-4939-2981-8_51

Heathershaw, A., Ward, P., David, A., 2001. The environmental impact of underwater sound.

Proceedings-Institute of Acoustics 23, 1–12.
Heyward, A., Colquhoun, J., Cripps, E., McCorry, D., Stowar, M., Radford, B., Miller, K., Miller, I., Battershill, C., 2018. No evidence of damage to the soft tissue or skeletal integrity of mesophotic corals exposed to a 3D marine seismic survey. Marine Pollution Bulletin 129, 8–13. https://doi.org/10.1016/j.marpolbul.2018.01.057
Hildebrand, J.A., 2005. Impacts of anthropogenic sound. Marine mammal research: conservation beyond crisis 101–124.
Holles, S., Simpson, S., Radford, A., Berten, L., Lecchini, D., 2013. Boat noise disrupts orientation behaviour in a coral reef fish. Marine Ecological Progress Series 485, 295–300. https://doi.org/10.3354/meps10346
Hubbs, C.L., Rechnitzer, A.B., 1952. Report on experiments designed to determine effects of underwater explosions on fish life. California Fish and Game 38, 333–366.
Hughes, A.R., Mann, D.A., Kimbro, D.L., 2014. Predatory fish sounds can alter crab foraging behaviour and influence bivalve abundance. Proceedings of the Royal Society B. 281, 20140715. https://doi.org/10.1098/rspb.2014.0715
Janik, V.M., 2014. Cetacean vocal learning and communication. Current Opinion in Neurobiology 28, 60–65. https://doi.org/10.1016/j.conb.2014.06.010
Jasny, M., 1999. Sounding the depths: Supertankers, sonar, and the rise of undersea noise. Natural Resources Defense Council.
Johnston, C.E., Phillips, C.T., 2003. Sound production in sturgeon *Scaphirhynchus albus* and *S. platorynchus (Acipenseridae)*. Environmental Biology of Fishes 68, 59–64.
Keevin, T., Gaspin, J., Gitschlag, G., Hempen, G., Linton, T., Smith, M., 1999. Twenty-fifth annual conference on explosives and blasting technique.
Koschinski, S., Lüdemann, K., 2020. Noise mitigation for the construction of increasingly large offshore wind turbines: Technical Options for complying with noise limits; The Federal Agency for Nature Conservation: Isle of Vilm, Germany.
Ladich, F., 1997. Agonistic behaviour and significance of sounds in vocalizing fish. Marine and Freshwater Behaviour and Physiology 29, 87–108. https://doi.org/10.1080/10236249709379002
Lamml, M., Kramer, B., 2005. Sound production in the reproductive behaviour of the weakly electric fish *Pollimyr us marianne* Kramer et al. 2003 (M*ormyridae,* Teleostei). Bioacoustics 15, 51–78. https://doi.org/10.1080/09524622.2005.9753538
Lillis, A., Bohnenstiehl, D., Peters, J.W., Eggleston, D., 2016. Variation in habitat soundscape characteristics influences settlement of a reef-building coral. PeerJ Life and Environment 4, e2557. https://doi.org/10.7717/peerj.2557
Lillis, A., Eggleston, D.B., Bohnenstiehl, D.R., 2013. Oyster Larvae Settle in Response to Habitat-Associated Underwater Sounds. PLoS ONE 8, e79337. https://doi.org/10.1371/journal.pone.0079337
Linton, T., Landry Jr, A., Buckner Jr, J., Berry, R., 1985. Effects upon selected marine organisms

of explosives used for sound production in geophysical exploration.
Løkkeborg, S., Ona, E., Vold, A., Salthaug, A., 2012. Sounds from seismic air guns: Gear- and species-specific effects on catch rates and fish distribution. Canadian Journal of Fisheries and Aquatic Sciences 69, 1278–1291. https://doi.org/10.1139/f2012-059
Luczkovich, J.J., Sprague, M.W., Johnson, S.E., Pullinger, R.C., 1999. Delimiting spawning areas of weakfish *Cynoscion regalis* (Family Sciaenidae) in Pamlico Sound, North Carolina using passive hydroacoustic surveys. Bioacoustics 10, 143–160. https://doi.org/10.1080/09524622.1999.9753427
Mann, D.A., Bowers-Altman, J., Rountree, R.A., 1997. Sounds produced by the striped cusk-eel *Ophidion marginatum* (*Ophidiidae*) during courtship and spawning. Copeia 1997, 610. https://doi.org/10.2307/1447568
Mann, D.A., Higgs, D.M., Tavolga, W.N., Souza, M.J., Popper, A.N., 2001. Ultrasound detection by clupeiform fishes. The Journal of the Acoustical Society of America 109, 3048–3054. https://doi.org/10.1121/1.1368406
Martin, B., Zeddies, D., MacDonnell, J., Vallarta, J., Delarue, J., 2014. Characterization and potential impacts of noise producing construction and operation activities on the outer continental shelf: data synthesis.
Maruska, K.P., Mensinger, A.F., 2009. Acoustic characteristics and variations in grunt vocalizations in the oyster toadfish *Opsanus tau.* Environmental Biology of Fishes 84, 325–337. https://doi.org/10.1007/s10641-009-9446-y
Maruska, K.P., Ung, U.S., Fernald, R.D., 2012. The African cichlid fish *Astatotilapia burtoni* uses acoustic communication for reproduction: Sound production, hearing, and behavioral significance. PLoS ONE 7, e37612. https://doi.org/10.1371/journal.pone.0037612
McCauley, R.D., Day, R.D., Swadling, K.M., Fitzgibbon, Q.P., Watson, R.A., Semmens, J.M., 2017. Widely used marine seismic survey air gun operations negatively impact zooplankton. Nature Ecology and Evolution 1, 0195. https://doi.org/10.1038/s41559-017-0195
Monczak, A., Berry, A., Kehrer, C., Montie, E.W., 2017. Long-term acoustic monitoring of fish calling provides baseline estimates of reproductive timelines in the May River estuary, southeastern USA. Marine Ecology Progress Series 581, 1–19.

Montie, E.W., Hoover, M., Kehrer, C., Yost, J., Brenkert, K., O'Donnell, T., Denson, M.R., 2017. Acoustic monitoring indicates a correlation between calling and spawning in captive spotted seatrout (*Cynoscion nebulosus*). PeerJ Life and Environment 5, e2944. https://doi.org/10.7717/peerj.2944

Mooney, A., Andersson, M., Stanley, J., 2020. Acoustic impacts of offshore wind energy on

fishery resources: An evolving source and varied effects across a wind farm's lifetime. Oceanography 33, 82–95. https://doi.org/10.5670/oceanog.2020.408

Mueller-Blenkle, C., McGregor, P.K., Gill, A.B., Andersson, M.H., Metcalfe, J., Bendall, V., Sigray, P., Wood, D.T., Thomsen, F., 2010. Effects of pile-driving noise on the behaviour of marine fish.

Myrberg, A.A., Fuiman, L.A., 2002. The sensory world of coral reef fishes. Coral reef fishes: Dynamics and diversity in a complex ecosystem 123–148.

Narins, P.M., Wilson, M., Mann, D.A., 2013. Ultrasound detection in fishes and frogs: Discovery and mechanisms, in: Köppl, C., Manley, G.A., Popper, A.N., Fay, R.R. (Eds.), Insights from comparative hearing research, springer handbook of auditory research. Springer New York, New York, NY, pp. 133–156. https://doi.org/10.1007/2506_2013_29

Nedelec, S.L., Mills, S.C., Lecchini, D., Nedelec, B., Simpson, S.D., Radford, A.N., 2016. Repeated exposure to noise increases tolerance in a coral reef fish. Environmental Pollution 216, 428–436.

Nedwell, J., Howell, D., 2004. A review of offshore windfarm related underwater noise sources. Collaborative Offshore Wind Energy Research into the Environment (COWRIE) Report 544, 1–57.

Nestler, J.M., Ploskey, G.R., Pickens, J., Menezes, J., Schilt, C., 1992. Responses of blueback herring to high-frequency sound and implications for reducing entrainment at hydropower dams. North American Journal of Fisheries Management 12, 667–683.

Nowacek, D.P., Thorne, L.H., Johnston, D.W., Tyack, P.L., 2007. Responses of cetaceans to anthropogenic noise. Mammal Review 37, 81–115. https://doi.org/10.1111/j.1365-2907.2007.00104.x

Paxton, A.B., Taylor, J.C., Nowacek, D.P., Dale, J., Cole, E., Voss, C.M., Peterson, C.H., 2017. Seismic survey noise disrupted fish use of a temperate reef. Marine Policy 78, 68–73.

Payne, J., Andrews, C., Fancey, L., Cook, A., Christian, J.R., 2007. Pilot study on the effects of seismic air gun noise on lobster *(Homarus americanus)*.

Pelc, R., Fujita, R.M., 2002. Renewable energy from the ocean. Marine policy 26, 471–479.

Peña, H., Handegard, N.O., Ona, E., 2013. Feeding herring schools do not react to seismic air gun surveys. ICES Journal of Marine Science 70, 1174–1180. https://doi.org/10.1093/icesjms/fst079

Peng, C., Zhao, X., Liu, G., 2015. Noise in the Sea and Its Impacts on Marine Organisms. International Journal of Environmental Research and Public Health 12, 12304–12323. https://doi.org/10.3390/ijerph121012304

Pijanowski, B.C., Villanueva-Rivera, L.J., Dumyahn, S.L., Farina, A., Krause, B.L., Napoletano, B.M., Gage, S.H., Pieretti, N., 2011. Soundscape ecology: The science of sound in the landscape. BioScience 61, 203–216. https://doi.org/10.1525/bio.2011.61.3.6

Pimentel, D., Herz, M., Glickstein, M., Zimmerman, M., Allen, R., Becker, K., Evans, J.,

Hussain, B., Sarsfeld, R., Grosfeld, A., 2002. Renewable energy: Current and potential issues: Renewable energy technologies could, if developed and implemented, provide nearly 50% of US energy needs; this would require about 17% of US land resources. Bioscience 52, 1111–1120.

Popper, A., Hice-Dunton, L., Williams, K., Jenkins, E., 2021. Workgroup report on sound and vibration effects on fishes and aquatic invertebrates for the State of the Science Workshop on Wildlife and Offshore Wind Energy 2020: Cumulative Impacts. 10.13140/RG.2.2.13130.49609.

Popper, A.N., Calfee, R.D., 2023. Sound and sturgeon: Bioacoustics and anthropogenic sound. The Journal of the Acoustical Society of America 154, 2021–2035.

Popper, A.N., Fay, R.R., 2011. Rethinking sound detection by fishes. Hearing Research 273, 25–36. https://doi.org/10.1016/j.heares.2009.12.023

Popper, A.N., Hastings, M.C., 2009. The effects of anthropogenic sources of sound on fishes. Journal of Fish Biology 75, 455–489. https://doi.org/10.1111/j.1095-8649.2009.02319.x

Popper, A.N., Hawkins, A.D., 2018. The importance of particle motion to fishes and invertebrates. The Journal of the Acoustical Society of America 143, 470–488. https://doi.org/10.1121/1.5021594

Popper, A.N., Hawkins, A.D., Fay, R.R., Mann, D.A., Bartol, S., Carlson, T.J., Coombs, S., Ellison, W.T., Gentry, R.L., Halvorsen, M.B., Løkkeborg, S., Rogers, P.H., Southall, B.L., Zeddies, D.G., Tavolga, W.N., 2014. Introduction, in: ASA S3/SC1.4 TR-2014 Sound exposure guidelines for fishes and sea turtles: A technical report prepared by ANSI-Accredited Standards Committee S3/SC1 and Registered with ANSI, SpringerBriefs in Oceanography. Springer International Publishing, Cham, pp. 1–3. https://doi.org/10.1007/978-3-319-06659-2_1

Popper, A.N., Smith, M.E., Cott, P.A., Hanna, B.W., MacGillivray, A.O., Austin, M.E., Mann, D.A., 2005. Effects of exposure to seismic airgun use on hearing of three fish species. The Journal of the Acoustical Society of America 117, 3958–3971. https://doi.org/10.1121/1.1904386

Putland, R.L., Mackiewicz, A., Mensinger, A.F., 2018. Localizing individual soniferous fish using passive acoustic monitoring. Ecological Informatics 48, 60–68.

Radford, C., Tindle, C., Montgomery, J., Jeffs, A., 2011. Modelling a reef as an extended sound source increases the predicted range at which reef noise may be heard by fish larvae. Marine Ecology Progress Series Ser. 438, 167–174. https://doi.org/10.3354/meps09312

Remage-Healey, L., Nowacek, D.P., Bass, A.H., 2006. Dolphin foraging sounds suppress calling and elevate stress hormone levels in a prey species, the Gulf toadfish. Journal of Experimental Biology 209, 4444–4451. https://doi.org/10.1242/jeb.02525

Rice, A.N., Farina, S.C., Makowski, A.J., Kaatz, I.M., Lobel, P.S., Bemis, W.E., Bass, A.H.,

2022. Evolutionary Patterns in Sound Production across Fishes. Ichthyology & Herpetology 110. https://doi.org/10.1643/i2020172

Richardson, A.J., Matear, R.J., Lenton, A., 2017. Potential impacts on zooplankton of seismic surveys. CSIRO Oceans and Atmosphere, Australia.

Richardson, W.J., Greene Jr, C.R., Malme, C.I., Thomson, D.H., 2013. Marine mammals and noise. Academic Press, San Diego, California.

Roberts, L., Cheesman, S., Breithaupt, T., Elliott, M., 2015. Sensitivity of the mussel Mytilus edulis to substrate-borne vibration in relation to anthropogenically generated noise. Marine Ecology Progress Series 538, 185–195. https://doi.org/10.3354/meps11468

Rogers, P.H., Cox, M., 1988. Underwater Sound as a Biological Stimulus, in: Atema, J., Fay, R.R., Popper, A.N., Tavolga, W.N. (Eds.), Sensory Biology of Aquatic Animals. Springer New York, New York, NY, pp. 131–149. https://doi.org/10.1007/978-1-4612-3714-3_5

Rountree, R.A., Perkins, P.J., Kenney, R.D., Hinga, K.R., 2002. Sounds of western north Atlantic fishes—data rescue. Bioacoustics 12, 242–244. https://doi.org/10.1080/09524622.2002.9753710

Scholik, A.R., Yan, H.Y., 2002. The effects of noise on the auditory sensitivity of the bluegill sunfish, *Lepomis macrochirus*. Comparative Biochemistry and Physiology Part A: Molecular & Integrative Physiology 133, 43–52. https://doi.org/10.1016/S1095-6433(02)00108-3

Simpson, S., Meekan, M., McCauley, R., Jeffs, A., 2004. Attraction of settlement-stage coral reef fishes to reef noise. Marine Ecology Progress Series 276, 263–268. https://doi.org/10.3354/meps276263

Simpson, S.D., Radford, A.N., Holles, S., Ferarri, M.C.O., Chivers, D.P., McCormick, M.I., Meekan, M.G., 2016. Small-boat noise impacts natural settlement behavior of coral reef fish larvae, in: Popper, A.N., Hawkins, A. (Eds.), The effects of noise on aquatic life II, Advances in Experimental Medicine and Biology. Springer New York, New York, NY, pp. 1041–1048. https://doi.org/10.1007/978-1-4939-2981-8_129

Sisneros, J.A., 2009. Seasonal Plasticity of Auditory Saccular Sensitivity in the Vocal Plainfin Midshipman Fish, *Porichthys notatus*. Journal of Neurophysiology 102, 1121–1131. https://doi.org/10.1152/jn.00236.2009

Smott, S., Monczak, A., Miller, M.E., Montie, E.W., 2018. Boat noise in an estuarine soundscape–A potential risk on the acoustic communication and reproduction of soniferous fish in the May River, South Carolina. Marine Pollution Bulletin 133, 246–260.

Solé, M., Lenoir, M., Durfort, M., Fortuño, J.-M., Van Der Schaar, M., De Vreese, S., André, M., 2021. Seagrass Posidonia is impaired by human-generated noise. Communications Biology 4, 743. https://doi.org/10.1038/s42003-021-02165-3

Solé, M., Sigray, P., Lenoir, M., van der Schaar, M., Lalander, E., André, M., 2017. Offshore

exposure experiments on cuttlefish indicate received sound pressure and particle motion levels associated with acoustic trauma. Scientific Reports 7, 45899.

Spence, J.H., 2007. A Summary of Existing and Future Potential Treatments for Reducing Underwater Sounds from Oil and Gas Industry Activities, in: OCEANS 2007. Presented at the Oceans 2007, IEEE, Vancouver, BC, pp. 1–15. https://doi.org/10.1109/OCEANS.2007.4449420

Staaterman, E., Paris, C.B., Kough, A.S., 2014. First evidence of fish larvae producing sounds. Biology Letters 10, 20140643. https://doi.org/10.1098/rsbl.2014.0643

Staaterman, E., Rice, A.N., Mann, D.A., Paris, C.B., 2013. Soundscapes from a Tropical Eastern Pacific reef and a Caribbean Sea reef. Coral Reefs 32, 553–557. https://doi.org/10.1007/s00338-012-1007-8

Stanley, J.A., Radford, C.A., Jeffs, A.G., 2012. Location, location, location: Finding a suitable home among the noise. Proceedings of the Royal Society B 279, 3622–3631. https://doi.org/10.1098/rspb.2012.0697

Stenberg, C., Støttrup, J.G., van Deurs, M., Berg, C.W., Dinesen, G.E., Mosegaard, H., Grome, T.M., Leonhard, S.B., 2015. Long-term effects of an offshore wind farm in the North Sea on fish communities. Marine Ecology Progress Series 528, 257–265.

Stocker, M., 2002. Fish, mollusks and other sea animals' use of sound, and the impact of anthropogenic noise in the marine acoustic environment. The Journal of the Acoustical Society of America 112, 2431–2431. https://doi.org/10.1121/1.4779979

Tavolga, W.N., 1980. Hearing and sound production in fishes in relation to fisheries management. Presented at the fish behavior and its use in the capture and culture of fishes. ICLARM Conference Proceedings, pp. 102–123.

Tavolga, W.N., 1960. Sound production and underwater communication in fishes. Animal Sounds and Communication 62, 93–136.

Teleki, G.C., Chamberlain, A.J., 1978. Acute Effects of Underwater Construction Blasting on Fishes in Long Point Bay, Lake Erie. Journal of the Fisheries Research Board of Canada 35, 1191–1198. https://doi.org/10.1139/f78-190

Thomsen, F., Gill, A., Kosecka, M., Andersson, M., Andre, M., Degraer, S., Folegot, T., Gabriel, J., Judd, A., Neumann, T., 2015. MaRVEN–Environmental impacts of noise, vibrations and electromagnetic emissions from marine renewable energy. Final study report RTD-KI-NA-27-738-EN-N prepared for the European Commission, Directorate General for Research and Innovation.

Thomsen, F., Lüdemann, K., Kafemann, R., Piper, W., 2006. Effects of offshore wind farm noise on marine mammals and fish. Biola, Hamburg, Germany on behalf of Collaborative Offshore Wind Energy Research into the Environment (COWRIE) Ltd 62, 1–62.

Thomsen, F., Mueller-Blenkle, C., Gill, A., Metcalfe, J., McGregor, P.K., Bendall, V.,

Andersson, M.H., Sigray, P., Wood, D., 2012. Effects of pile driving on the behavior of cod and sole. Presented at the the effects of noise on aquatic life, Springer, pp. 387–388.

Tougaard, J., Hermannsen, L., Madsen, P.T., 2020. How loud is the underwater noise from operating offshore wind turbines? The Journal of the Acoustical Society of America 148, 2885–2893. https://doi.org/10.1121/10.0002453

Tougaard, J., Kyhn, L.A., Amundin, M., Wennerberg, D., Bordin, C., 2012. Behavioral reactions of harbor porpoise to pile-driving noise. Presented at the effects of noise on aquatic life, Springer, pp. 277–280.

Valentine, S.V., 2011. Emerging symbiosis: Renewable energy and energy security. Renewable and Sustainable Energy Reviews 15, 4572–4578.

Van Oosterom, L., Montgomery, J.C., Jeffs, A.G., Radford, C.A., 2016. Evidence for contact calls in fish: Conspecific vocalisations and ambient soundscape influence group cohesion in a nocturnal species. Scientific Reports 6, 19098. https://doi.org/10.1038/srep19098

Vermeij, M.J.A., Marhaver, K.L., Huijbers, C.M., Nagelkerken, I., Simpson, S.D., 2010. Coral Larvae Move toward Reef Sounds. PLoS ONE 5, e10660. https://doi.org/10.1371/journal.pone.0010660

Vester, H.I., Folkow, L.P., Blix, A.S., 2004. Click sounds produced by cod (*Gadus morhua*). The Journal of the Acoustical Society of America 115, 914–919. https://doi.org/10.1121/1.1639106

Ward, R.J., 2015. Measuring the speed of sound in water. Physics Education 50, 727–732. https://doi.org/10.1088/0031-9120/50/6/727

Wenz, G.M., 1962. Acoustic ambient noise in the ocean: spectra and sources. The Journal of the Acoustical Society of America 34, 1936–1956. https://doi.org/10.1121/1.1909155

Wilson, B., Batty, R.S., Dill, L.M., 2004. Pacific and Atlantic herring produce burst pulse sounds. Proceedings of the Royal Society of London B 271, S95–S97.

Wilson, C., Wilson, P., Greene, C., Dunton, K., 2013. Seagrass meadows provide an acoustic refuge for estuarine fish. Marine Ecology Progress Series 472, 117–127. https://doi.org/10.3354/meps10045

Wilson, M., Montie, E.W., Mann, K.A., Mann, D.A., 2009. Ultrasound detection in the Gulf menhaden requires gas-filled bullae and an intact lateral line. Journal of Experimental Biology 212, 3422–3427.

Wright, D.G., Hopky, G.E., 1998. Guidelines for the use of explosives in or near Canadian fisheries waters. Fisheries and Oceans Canada Ottawa.

Wright, K.J., Higgs, D.M., Cato, D.H., Leis, J.M., 2010. Auditory sensitivity in settlement-stage larvae of coral reef fishes. Coral Reefs 29, 235–243. https://doi.org/10.1007/s00338-009-0572-y

Atlantic States Marine Fisheries Commission

Commission Business Session

August 8, 2024
10:00 - 10:30 a.m.

Draft Agenda

The times listed are approximate; the order in which these items will be taken is subject to change; other items may be added as necessary.

1. Welcome/Call to Order *(J. Cimino)*
2. Board Consent
    - Approval of Agenda
    - Approval of Proceedings from January 2024
3. Consider Noncompliance Recommendations, if necessary **Final Action**
4. Other Business/Adjourn

The meeting will be held at The Westin Crystal City (1800 Richmond Highway, Arlington, VA; 703.486.1111) and via webinar; click here for details.

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

DRAFT PROCEEDINGS OF THE

ATLANTIC STATES MARINE FISHERIES COMMISSION

BUSINESS SESSION

The Westin Crystal City
Arlington, Virginia
Hybrid Meeting

January 25, 2024

These minutes are draft and subject to approval by the Business Session.
The Board will review the minutes during its next meeting.

TABLE OF CONTENTS

INDEX OF MOTIONS

ATTENDANCE TO BE FILLED ON A LATER DATE

The Commission Business Session of the Atlantic States Marine Fisheries Commission convened in the Jefferson Ballroom of the Westin Crystal City Hotel, Arlington, Virginia, via hybrid meeting, in-person and webinar; Thursday, January 25, 2024, and was called to order at 10:45 a.m. by Chair Joe Cimino.

CALL TO ORDER

CHAIR JOE CIMINO: I'm calling to order the Commission's Business Session. We do have a couple agenda items that we need to cover here.

APPROVAL OF AGENDA

CHAIR CIMINO: I'm going to ask if there are any, excuse me, are there any additions to the agenda? Toni, do you want to do this formally as an addition?

MS. TONI KERNS: Yes.

CHAIR CIMINO: We have one from, Toni, go ahead.

MS. KERNS: During Policy Board we forgot about a letter that the American Lobster Board asked us to send to NOAA Fisheries on rulemaking, pertaining to Addendum XXI and XXII, so the Board Chair will bring that up.

CHAIR CIMINO: Yes, we'll cover that. Unless there are any other additions or concerns, I'm going to assume that we can approve the agenda with that addition. I don't see any hands up.

APPROVAL OF PROCEEDINGS

CHAIR CIMINO: We'll move on to approval of the proceedings from the annual meeting of October, '23. I see a hand, Doug.

MR. DOUGLAS E. GROUT: Just briefly. It indicates on the time page that we met there in 2022 instead of 2023.

CHAIR CIMINO: Well, thank you, that's a great catch. That was one of those Easter eggs that we just put out there every once in a while, make sure somebody is looking. You win the prize there, thank you. I appreciate that. We'll make that edit. If there are no other edits.

MR. GROUT: I'm glad to offer my services.

CHAIR CIMINO: I love it, I love it. The proceedings approved width that edit. It's a very important edit, I may add.

PUBLIC COMMENT

CHAIR CIMINO: Are there any public comments for the Business Session here? We do have some folks from the public, but I don't see any hands, and no online. Okay, great.

CONSIDER APPROVAL OF REVISION TO 2024 ACTION PLAN

CHAIR CIMINO: We'll move on. Toni will cover the Action Plan.

MS. KERNS: Thank you, Mr. Chairman, and I just have one slide and I'll talk while that slide gets put up. But the Commission Summer Flounder, Scup, and Black Sea Bass Management Board met with the Mid-Atlantic Council in December, to set recreational specifications.

ADDITION TO GOAL 1 TO DEVELOP AN ACTION WITH THE MID-ATLANTIC FISHERY MANAGEMENT COUNCIL FOR SUMMER FLOUNDER COMMERCIAL MEASURES

MS. KERNS: Also, during that time there was a discussion on the summer flounder flynet definition, and boundaries of the small mesh exemption area.

Both bodies agreed to take up this issue, or their intent to take up these issues immediately in 2024, in order to address changes in time for NOAA to promulgate regulations by November of this year. This issue was not included in the Commission's Action Plan, so we wanted to see if the Commission would consider adding it to the Action Plan, so we can have similar regulations if changes are made.

The reason why we would put these regulations in the Commission's FMP is because states have these

regulations in their definitions, in particular for the flynet definition, as well as some states reference the exemption areas, while the measures are pertaining to mostly federal water fisheries, it is important to have cohesiveness between the two FMPs.

The one thing to note for this, and this is something that we did not discuss at the Council meetings, because we weren't sure how it would impact the timeline of work that these two management bodies are doing, as well is that there is an amendment on sector separation and recreational accountability that the Policy Board is working on with the Mid-Atlantic Council.

Because of this work on the summer flounder commercial measures, that work would be pushed back, and would be addressed at the earliest in the fall of this year. That would be presenting a scoping document for recreational accountability and the sector separation, and I can take any questions.

CHAIR CIMINO: Questions for Toni. I realize not every member state is paying close attention to this, but you know although this is a longstanding issue, we feel like it is something that needs to be addressed. I was glad to see the Mid take action, and most likely doing the heavy lifting on this. I'll just ask if there is any objection to adding this to our Plan for 2024.

I don't see any objections. I personally really appreciate that. I would like to get this straightened out. With no objections we'll move forward on that. Well, let's cover the lobster letter that we have as an added agenda item. We have a motion on the board, so Jason, if you don't mind.

DR. JASON McNAMEE: **On behalf of the Lobster Board, move the Commission to send a letter to NOAA Fisheries to withdraw the Commission's recommendation to implement the measures of Section 3 and 4, except Sections 3.1.1 and 3.2.1; transfers of multi-LCMA trap allocation of Addendum XXI, and all of Addendum XXII.**

CHAIR CIMINO: Great, thank you, do we have a second for that motion? Cheri Patterson from New Hampshire, thank you. Any discussion on this motion? Yes, go ahead, Toni, sorry.

MS. KERNS: Just to add to the record that the Board, as Pat talked about at the Policy Board, did note the intention of us expressing to NOAA Fisheries how we intend the Mitchell Provision to apply to the minimum size. Oh, that is for a different letter, and I'm so sorry. Never mind.

CHAIR CIMINO: No problem. We're still going to have that on the record. We'll have that on the record as much as possible. However, yes, that does not necessarily apply to this motion. Any further discussion on this motion? **Any objection to this motion? Not seeing any. We'll consider that passed by unanimous consent**.

REVIEW AND CONSIDER APPROVAL OF 2024-2028 STRATEGIC PLAN

CHAIR CIMINO: With that I'm going to turn it over to Bob to go over the 2024 to 2028 Strategic Plan.

EXECUTIVE DIRECTOR ROBERT E. BEAL: Great, thank you, Mr. Chair. In the interest of time, and recognition of the fact that most folk around the table were here at the Executive Committee yesterday when I went over this in fairly high detail. I'm just going to go over some of the changes that were agreed to at the Executive Committee yesterday, then I'm happy to answer any questions.

But the idea is that we are seeking approval of this document at this point. It's been a couple iterations have gone past the Executive Committee; you know it was brought up at the Policy Board at the annual meeting. The suggested staff edits were included in briefing materials for the Executive Committee, and for this Business Session.

With that, there are a couple of highlights worth noting that were not reflected in the edits that are included here. At the top of Page 2 we're going to insert recognition that we also partnership and work with U.S. Fish and Wildlife Service and USGS. Then moving down along the majority of this was

approved, or recommended for approval as edited yesterday.

Then getting down into goals themselves. Goal 1, there were no recommended changes yesterday, and Goal 2, Jason McNamee brought up the notion that a lot of pieces of Goal 2 kind of look like MSE. But we're going to put a specific reference to Management Strategy Evaluations included as one of the bullets in Goal 2.

Then moving along, actually, I missed one item, two items. Okay, so on Page 8 there is a notion about, well the bullet reads, promote sustainable harvest and access to rebuild fisheries. There is a side note there about, this might take some further discussion. The Executive Committee felt that it was okay as written, so we're going to maintain that in Goal Number 1, as it's written.

Then in Goal 2, there is a note, same idea that this may warrant some more discussion for the bullet that reads, balance request from fishery management with finite assessment workload capacity. There was some good discussion on that yesterday, but ultimately, the Executive Committee recommended that we keep that the same.

Then no changes to Goals 3, 4, and 5. When we went down to Goal 6, there was a conversation about some of the sort of new approaches and strategies that some of our stakeholders have, as far as commenting and generating a lot of press and a lot of e-mail activity and social media activity that really isn't accurate, based on some of the science that the Commission has. There is a suggestion that we include a bullet there that really goes at, directly and proactively, engaging and commenting on some of the Commission management decisions and scientific information to prevent, or at least reduce some of the misinformation that is out there for some of these topics. Throughout the document there is also references to offshore wind/renewable energy. We're going to balance that out.

The offshore wind does take a lot of the bandwidth for a lot of the states, and some of the Commission activities, but there are also other renewable energy activities that are out there that may be emerging and may become an issue for the fish. We'll balance that out a little bit better throughout the document.

Other than the staff suggested edits, those few that I just mentioned really are all the other changes that we will weave into this document. The idea is, if the Commission is comfortable approving this today, you can do that. Staff will update the document and publish it on the website, and share it with all the Commissioners. Happy to answer any questions, but those are the highlights of the suggested changes.

CHAIR CIMINO: Thank you, Bob, any questions or comments for Bob? Not seeing any; as noted previously in our Policy Board discussions, we don't have any noncompliance findings.

ADJOURNMENT

Is there anything else to come before us today? Not seeing anything, any hands online? Well, it's great with that, I'll entertain a motion to adjourn. John Clark, second by Lynn Fegley. That is Delaware and Maryland. The folks closest to home are ready to go. Good for you, safe travels everyone.

(Whereupon the meeting adjourned at10:57 a.m. on Thursday, January 25, 2024)