Atlantic States Marine Fisheries Commission

Atlantic Menhaden Management Board

August 3, 2022
1:30 – 5:00 p.m.
Hybrid Meeting

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.
This meeting will include a 10 minute break.

1. Welcome/Call to Order (*M. Bell*)	1:30 p.m.
2. Board Consent • Approval of Agenda • Approval of Proceedings from May 2022	1:30 p.m.
3. Public Comment	1:35 p.m.
4. Consider Fishery Management Plan Review and State Compliance for 2021 Fishing Year *(J. Boyle)* **Action**	1:45 p.m.
5. Consider Draft Addendum I to Amendment 3 on Commercial Allocations, Episodic Event Set Aside Program, and Incidental Catch/Small-scale Fisheries for Public Comment (*J. Boyle*) **Action**	2:00 p.m.
6. Review 2022 Atlantic Menhaden Single-Species Stock Assessment Update (*A. Schueller*)	4:15 p.m.
7. Review and Populate Advisory Panel Membership (*T. Berger*) **Action**	4:55 p.m.
8. Other Business/Adjourn	5:00 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

Atlantic States Marine Fisheries Commission

MEETING OVERVIEW

Atlantic Menhaden Management Board
Wednesday, August 3, 2022
1:30 p.m. – 5:00 p.m.
Webinar

Chair: Mel Bell (SC) Assumed Chairmanship: 10/21	Technical Committee Chair: Josh Newhard (USFWS)	Law Enforcement Committee Representative: Robert Kersey (MD)
Vice Chair: Conor McManus (RI)	Advisory Panel Chair: Meghan Lapp (RI)	Previous Board Meeting: May 3, 2022
Voting Members: ME, NH, MA, RI, CT, NY, NJ, PA, DE, MD, PRFC, VA, NC, SC, GA, FL, NMFS, USFWS (18 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from May 3, 2022

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 should use the webinar raise your hand function and the Board Chair will let you know when to speak. 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 Board 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 Fishery Management Plan Review and State Compliance for 2021 Fishing Year (1:50-2:05 p.m.) Action

Background

- State compliance reports were due April 1, 2022
- The Plan Review Team reviewed each state reports and compiled the annual FMP Review.
- Pennsylvania, South Carolina, Georgia, and Florida have requested and meet the requirements for *de minimis*.

Presentations

- Overview of Atlantic menhaden FMP Review by J. Boyle (**Briefing Materials**)

Board Actions for Consideration

- Accept 2021 FMP Review and State Compliance Reports
- Approve *de minimis* requests for Pennsylvania, South Carolina, Georgia, and Florida

5. Consider Draft Addendum I to Amendment 3: *Commercial Allocations, Episodic Event Set Aside Program, and Incidental Catch/Small-scale Fisheries* for Public Comment (2:05-4:15 p.m.) Action

Background

- In August 2021, the Board initiated a draft addendum to consider changes to commercial allocations, the episodic event set aside (EESA) program, and the incidental catch and small-scale fisheries provision (IC/SSF) based on the Board work group report.
- The Plan Development Team (PDT) incorporated the Boards feedback from May into the Draft Addendum (**Briefing Materials**). Additionally, the PDT revised their recommendations for the Board's consideration in approving the document for public comment (**Briefing Materials)**.

Presentations

- Overview of Draft Addendum I to Amendment 3 by J. Boyle

Board Actions for Consideration

- Approve Draft Addendum I to Amendment 3 for public comment

6. Review 2022 Atlantic Menhaden Single-Species Stock Assessment Update (4:15-4:55 p.m.)

Background

- The 2022 Stock Assessment Update was completed in July **(Briefing Materials)**.
- The TC met via webinar on July 11th to review a draft of the Stock Assessment Update and provide recommendations to the Stock Assessment Subcommittee.

Presentations

- Stock Assessment Update overview by A. Schueller

7. Review and Populate Advisory Panel Membership (4:55-5:00 p.m.)

Background

- There is one new nomination to the Atlantic Menhaden Advisory Panel—Dr. Barbara Garrity-Blake, an Adjunct Associate Professor at Duke University (**Briefing Materials**).

Presentations

- Nomination by T. Berger

Board Actions for Consideration

- Approve Atlantic Menhaden Advisory Panel Nomination

8. Other Business/Adjourn

Atlantic Menhaden

Activity level: High

Committee Overlap Score: High (SAS, ERP WG overlaps with American eel, striped bass, northern shrimp, Atlantic herring, horseshoe crab, weakfish)

Committee Task List

- TC – April 1st: Annual compliance reports due

TC Members: Josh Newhard (USFWS, Chair), Corrin Flora (NC), Joey Ballenger (SC), Jason McNamee (RI), Eddie Leonard (GA), Jeff Brust (NJ), Matt Cieri (ME), Ingrid Braun (PRFC), Micah Dean (MA), Kurt Gottschall (CT), Caitlin Craig (NY, Vice-Chair), Shanna Madsen (VMRC), Chris Swanson (FL), Ray Mroch (NMFS), Amy Schueller (NMFS), Alexei Sharov (MD), Jeff Tinsman (DE), Kristen Anstead (ASMFC), James Boyle (ASMFC)

SAS Members: Amy Schueller (NMFS, SAS Chair), Matt Cieri (ME), Micah Dean (MA), Robert Latour (VIMS), Chris Swanson (FL), Ray Mroch (NMFS), Jason McNamee (RI), Alexei Sharov (MD), Jeff Brust (NJ) Kristen Anstead (ASMFC), James Boyle (ASMFC), Joey Ballenger (SC)

ERP WG Members: Jason Boucher (NOAA), Matt Cieri (ME,ERP Chair), Michael Celestino (NJ), David Chagaris (FL), Micah Dean (MA), Rob Latour (VIMS), Jason McNamee (RI), Amy Schueller (NFMS), Alexei Sharov (MD), Howard Townsend (NFMS), Jim Uphoff (MD), Kristen Anstead (ASMFC), Katie Drew (ASMFC), Sarah Murray (ASMFC)

DRAFT PROCEEDINGS OF THE

ATLANTIC STATES MARINE FISHERIES COMMISSION

ATLANTIC MENHADEN MANAGEMENT BOARD

The Westin Crystal City
Arlington, Virginia

May 3, 2022

Draft Proceedings of the Atlantic Menhaden Management Board Meeting
May 2022

TABLE OF CONTENTS

INDEX OF MOTIONS

ATTENDANCE

Board Members

Megan Ware, ME, proxy for Pat Keliher (AA)
Steve Train, ME (GA)
Sen. David Miramant, ME (LA)
Cheri Patterson, NH (AA)
Ritchie White, NH (GA)
Dennis Abbott, NH, proxy for Sen. Watters (LA)
Nichola Meserve, MA, proxy for Dan McKiernan (AA)
Raymond Kane, MA (GA)
Sarah Ferrara, MA, proxy for Rep. Peake (LA)
Conor McManus, RI, proxy for Jason McNamee (AA)
David Borden, RI (GA)
Eric Reid, RI, proxy for Sen. Sosnowski (LA)
Matt Gates, CT, proxy for J. Davis (AA)
Rob LaFrance, CT, proxy for B. Hyatt (GA)
Jim Gilmore, NY (AA)
Scott Curatolo-Wagemann, NY, proxy for E. Hasbrouck (GA)
Joe Cimino, NJ (AA)
Tom Fote, NJ (GA)
Kris Kuhn, PA, proxy for T. Schaeffer (AA)
Loren Lustig, PA (GA)
G. Warren Elliott, PA (LA)
John Clark, DE (AA)
Roy Miller, DE (GA)
Craig Pugh, DE, proxy for Rep. Carson (LA)
Lynn Fegley, MD, Administrative proxy
Russell Dize, MD (GA)
Allison Colden, MD, proxy for Del. Stein (LA)
Pat Geer, VA, Administrative proxy
Bryan Plumlee, VA (GA)
Chris Batsavage, NC, proxy for K. Rawls (AA)
Jerry Mannen, NC (GA)
Bill Gorham, NC, proxy for Sen. Steinburg (LA)
Mel Bell, SC (AA)
Malcolm Rhodes, SC (GA)
Chris McDonough, SC, proxy for Sen. Cromer (LA)
Doug Haymans, GA (AA)
Spud Woodward, GA (GA)
Hannah Hart, FL, proxy for J. McCawley (AA)
Marty Gary, PRFC
Karen Abrams, NMFS
Rick Jacobson, USFWS

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

Ex-Officio Members

Joshua Newhard, Technical Committee Chair
Amy Schueller, Stock Assessment Subcommittee Chair

Staff

Bob Beal
Toni Kerns
Lisa Carty
Tina Berger
Pat Campfield
Kristen Anstead
James Boyle
Katie Drew
Maya Drzewicki
Emilie Franke
Lisa Havel
Chris Jacobs
Jeff Kipp
Sarah Murray
Mike Rinaldi
Deke Tompkins

Guests

Mike Armstrong, MA DMR
Pat Augustine, Coram, NY
Russell Babb, NJ DEP
Rachel Barales, CCCFA
Robert Beal, ME DMR
Alan Bianchi, NC DENR
Colleen Bouffard, CT DEEP
Karen Bradbury, Ofc. of Sen. Whitehouse
Bill Brantley, NC DENR
Delayne Brown, NH F&G
Michael Brown, ME DMR
Jeff Brust, NJ DEP
Andrew Button, VMRC
Benson Chiles, Chiles Consulting
Heather Corbett, NJ DEP
Nichole Lengyel Costa, RI DEM
Caitlin Craig, NYS DEC
Maureen Davidson, NYS DEC
Monty Deihl, Ocean Fleet Svcs.
Chris Dollar

Guests (continued)

John Duane
Dawn Franco, GA DNR
Tony Friedrich, SGA
David Frulla, KDW, LLC
Alexa Galvan, VMRC
Shaun Gehan, Gehan Law
Lewis Gillingham, VMRC
Angela Giuliano, MD DNR
Pam Lyons Gromen, Wild Oceans
Marin Hawk, MSC
Helen Takade-Heumacher, EDF
Jocelyn Higgins, TRCP
Peter Himchak, Omega Protein
Carol Hoffman, NYS DEC
Harry Hornick, MD DNR
Jesse Hornstein, NYS DEC
Jeff Kaelin, Lund's Fisheries
Julia Kaplan, MA DMF
Pat Keliher, ME (AA)
Ben Landry, Omega Protein
Tom Lilly
Carl LoBue, TNC
Brooke Lowman, VMRC
Mike Luisi, MD DNR
Shanna Madsen, VMRC
Jason McNamee, RI DEM
John Maniscalco, NYS DEC
Genine McClair, MD DNR
Dan McKiernan, MA (AA)
Steve Meyers, Williamsburg, VA
Mike Millard
Drew Minkiewicz, Kelley Drye
Chris Moore, CBF
Clinton Morgeson, VA DWR
Kathy Rawls, NC (AA)
Kirby Rootes-Murdy, USGS
Thomas Newman
Jeff Nichols, ME DMR
Derek Orner, NOAA
Willow Patten, NC DENR
Michael Pierdinock
Will Poston, SGA
Jill Ramsey, VMRC
Harry Rickabaugh, MD DNR
Mike Ruccio, NOAA
Brendan Runde, TNC
Chris Scott, NYS DEC
Tara Scott, NOAA
David Sikorski, CCA MD
Ethan Simpson, VMRC
Melissa Smith, ME DMR
Somers Smott, VMRC
Chris Uraneck, ME DMR
Kate Wilke, TNC
Angel Willey, MD DNR
John Page Williams
Dan Zapf, NC DENR
Erik Zlokovitz, MD DNR
Jordan Wisecup, *Congressional Sportsmen*
Chris Wright, NOAA
Phil Zalesak, Tall Timbers, MD
Erik Zlokovitz, MD DNR
Renee Zobel, NH F&G

The Atlantic Menhaden 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; Tuesday, May 3, 2022, and was called to order at 12:45 p.m. by Chair Robert E. Beal.

CALL TO ORDER

CHAIR ROBERT E. BEAL: Well, good afternoon, everyone. It's 12:45 by my clock. My name is Bob Beal; and I would like to call the Atlantic Menhaden Management Board meeting to order. As the agenda notes, Mel Bell is the actual Chair of this Board, but Mel was unable to make it today, but he's online and may chime in with some comments as we go along.

The Vice-Chair of this Board is Conor McManus, and Conor wanted to sit as part of his state's delegation, and participate in the discussion today, so that leaves me. I'm going to Chair the meeting this afternoon. Before we get too far into the meeting, I want to give one quick presentation. As everyone knows, we're about two plus years behind on awards and recognitions and all sorts of other things at the Commission.

RECOGNITION OF PAT KELIHER AS COMMISSION'S PAST CHAIR

CHAIR BEAL: I want to try to dig out of that hole a little bit with one fairly quick but very important presentation and recognition of someone. Pat Keliher, can you come up from the very back of the room up here, if you don't mind. He's reluctantly and slowly getting up, let the record show. As Pat wanders up here. I just want to thank Pat for the previous two years as the Commission's Chair.

You know as Spud likes to note, Pat only actually presided over one in-person meeting, so we still got him a full-sized recognition, even though he only did one of the meetings. But actually, the fact that Pat wasn't here, we weren't here for a number of those meetings, actually made his job a lot harder to Chair. He helped a whole lot shepherd all of us through COVID, which was a bit of an experience for all of us. We made it up as we went along, but I called Pat a lot and frequently at odd hours, and all kinds of different times to ask for advice and guidance, and he was always there to help out. I just want to thank him for that and really appreciate everything he did for the Commission, to keep us moving along.

We weren't able to get together in person, but with Pat's guidance and working with Spud as Vice-Chair at the time, he was able to get us through a lot of confusing times, and keep the Commission working and get everybody together virtually. A lot of the sort of protocols and practices for our virtual meetings all went through Pat, and we really appreciate his guidance and his thoughtfulness in making sure that we all stayed productive during our two years apart from each other. With that help me in thanking Pat for his time as Chair. (Applause)

MR. PATRICK C. KELIHER: Thank you very much, Bob. I appreciate it. It certainly was a different time being Chair. I really did enjoy every moment of it. It's a privilege to be voted in by your peers to sit in the chair up front. Bob is right, we did talk at a lot of very odd hours, every time he was on vacation or I was on vacation, or early in the morning or late at night.

There was a lot of juggling to do, but I was pleased to do it, and very pleased that Spud stepped up into the role that he's in now. The best part about COVID is, I told Bob and Laura right from the beginning, I didn't want a hospitality suite in my room, and then COVID hit. Worked out great, worked out great. Thank you very much.

CHAIR BEAL: Pat, before you run off, I want to present this commemorative clock recognizing your time as Commission Chair, and something you can keep to remember the COVID years, apparently. Here you go. Congratulations. All right, while he figures out the box to put his clock in, we'll go ahead and get started with the Menhaden meeting.

With that we'll go ahead. Again, before we get into the agenda, just a reminder we've got a hard stop at about six o'clock tonight. I know that seems like a long way off, but this is the Menhaden Board meeting so you never know. We'll take some breaks as needed during this meeting. At a minimum we're going to have a break at 2:30, because the desert from lunch is being brought out, and we can get a little sugar to energize us, and carry us through the rest of the meeting.

Plan on a break at 2:30, but if we all feel that we need one before then, or it seems appropriate we might do one, or after that. We'll just sort of play that by ear.

APPROVAL OF AGENDA

CHAIR BEAL: With that let's jump into the agenda. Are there any changes or additions to the agenda that was provided in supplemental or in the briefing materials? All right, seeing no hands we'll approve the agenda by consent.

APPROVAL OF PROCEEDINGS

CHAIR BEAL: Same question for the proceedings from January of 2022. Any changes or additions or modifications to the proceedings that were provided in the briefing material? Yes, Nichola.

MS. NICHOLA MESERVE: A point of clarification, potentially for the minutes. At one point Mr. Geer had noted that the menhaden fleet had lost a certain number of days, and I believe the minutes say 39. I've since heard 59, and I just was hoping that I wanted to make sure I knew the minutes properly reflected the number.

MR. PAT GEER: Thanks for bringing that, it was 59.

CHAIR BEAL: Thanks for that catch, Nichola, and clarification. Pat, we will make that change in the minutes going forward. Any other changes? Seeing none; the minutes will stand approved by consent.

PUBLIC COMMENT

CHAIR BEAL: Now we get into the Public Comment portion of the meeting, and again this is for items that are not on today's agenda.

I know of two individuals, Phil Zalesak and Tom Lilly both would like to make a comment. Are there any other individuals in the audience here or online that would like to make a comment to the Board during this public comment period? I don't see any other hands in the room or online, is that correct, Toni? Okay, so no other hands. We'll give Phil and Tom each three minutes, and take it away, Phil.

MR. PHIL ZALESAK: Thank you very much. I'm going to talk about the striped bass dependency on Atlantic menhaden, and all you have to do is follow the science. This Board and the Striped Bass Board can actually solve this problem. Why worry about striped bass? Well, it's a 7.7-billion-dollar GDP for the Atlantic coast. That's a lot of coin, plus there is 104,000 jobs associated with it.

In the state of Maryland, it's 10,000 jobs and 800 million dollars. That's for one fishery. All right, so you may say well, I don't live in Maryland, and I don't really like striped bass, you know, I don't really care, I live in Maine, or something like that. Well, according to Dr. David Secor, 60 percent of the ocean stock of striped bass comes from the Chesapeake Bay.

We might want to be concerned with that. From Amendment 7, for the striped bass, here is some data. We've gone from 2010 up to about 5.5 million fish down to about 1.7 fish. That is over 60 percent drop in recreational harvest across the Atlantic coast. Well, how about Maryland? Maryland had gone from about 2.3 million fish down to 787,000 fish. That is about a 62 percent drop in recreational harvest.

Well, that's all right, Phil, there are plenty of fish in the Chesapeake Bay, let's not worry about it, a lot of little guys out there. Not so. Here is the October graph, showing the long-term index for the Maryland portion of the Chesapeake Bay at 11.4.

What do you think it was last year? It was 3.2, and it's been three straight years of very low juvenile productivity, if you will. It kind of looks like the early eighties.

We've been talking about overharvesting Atlantic menhaden in the Chesapeake Bay since 2004. To the credit of this Board, you funded a study by Dr. Matt Cieri in January of 2020. He reported out and said, you know the higher mortality rate for Atlantic menhaden, the higher the mortality rate for striped bass. Here's a nice little graph that shows it.

You go below the mortality rate, you go past the threshold, and you go all the way up to the target, and you can get there. You have the data. Well, that's all right, Phil, we'll just move on. What did this Board do? To the Board's credit, you cut the total allowable harvest for the entire Atlantic coast from 216,000 metric tons down to 194,400 metric tons. You said, we've got to cut it by 10 percent. But you really did nothing about the Chesapeake Bay.

CHAIR BEAL: Phil, let's go ahead and wrap it up.

MR. ZALESAK: I'm almost done. The press release says the Board will be accounting for the species role as an important forage fish. I haven't seen it, and this is the key Board right here. Almost done. The ERP Committee reported out last year, it said, you know it will take five to seven years to determine what the biomass of Atlantic Menhaden in the Chesapeake Bay. We don't have time. We've got to make a decision now, so here is a recommendation. Prohibit the commercial reduction fishery of Atlantic menhaden in the Chesapeake Bay, specifically push out that reduction three nautical miles off the Atlantic coast.
CHAIR BEAL: Great, thanks, Phil, appreciate the comment.

MR. ZALESAK: Well, I have one other recommendation, sir, and that is to put this on the agenda for August, and I want to hear a discussion on it, and I want to see a vote on it, because we're out of time and there is no more science to be reviewed. Thank you for your time.

CHAIR BEAL: Thanks, Phil, and Tom Lilly go ahead, you have three minutes, please.

MR. THOMAS LILLY: A lot of Marylanders supported the Maryland State Resolution that asked this Board to decide whether factory fishing should continue in Chesapeake Bay. That was in the Maryland Senate this year. These concerned Marylanders include 70,000 Sierra Club members, 3,000 Shore Rivers members, the leaders of 10 state-wide fishing clubs, the charter captains, scientists, and importantly the Maryland senators and delegates who make up what they call the Maryland Legislative Sportsmen's Caucus.

These are the senators and delegates in Maryland concerned with protecting our conservation and fishing interests. I guess the question for the Board is, will you do what over a million Marylanders are requesting? Maryland, keep in mind, is the state most affected by what you allow in Virginia.

The amount of menhaden in the Bay has a direct impact, as you know, on our striped bass and nesting ospreys, and it directly affects the quality of life and experience 8 million days that Maryland friends, family and children spend out of doors fishing and enjoying Chesapeake Bay. Eight million days a year. Every one of those days is affected by your decisions.

Just moving the factory fishing into the U.S. Atlantic zone would get 50,000 tons of menhaden forage to our fish and wildlife when they need it the most. Increasing days fishing, and enjoying the wonders of Chesapeake Bay, as Sierra Club put it, by just 15 percent. Fifteen percent would add over a 1,200,000, more days for Marylander's fishing and enjoying the Chesapeake Bay.

Repeat, 1,200,000 additional days a year, and the physical and mental health benefits, which have been scientifically proven, and given to you in the things that we have submitted, which follow. Those million plus days as a generator, would be a generator of hundreds of millions of dollars of economic impact. The question again, will this Board place these essential issues on the agenda for

the August meeting. Thank you all very much, have a great meeting.

CHAIR BEAL: Thanks, Mr. Lilly, appreciate the comment. All right, any other public comment either online or in the room? Seeing none; we'll go ahead and jump into the agenda.

REVIEW OF THE 2021 LANDINGS DATA

CHAIR BEAL: The next agenda item is a Review of the 2021 Landings Data, and James Boyle is going to give that presentation.

I don't think many of you guys have met James, he's a new FMP coordinator. He's unable to be here today, but hopefully in August you'll get to meet him actually in person. But he'll be giving that update and available for questions at the end of it. With that go ahead, James, if you are ready to go.

MR. JAMES BOYLE IV: Thank you very much, and yes, nice to virtually meet everybody. I hope to see you all in person in August. As he has mentioned, I'm going to be giving an update on the 2021 landings data ahead of the full FMP review process plan for the next Board meeting in August. This way you'll have the most up to date information going into the discussion of the Draft Addendum today.

Just a quick overview of the presentation. Essentially, it's a pared down version of the FMP Review to focus just on landings, with a quick reminder at the beginning of what are the current status of the FMP. I have that quick reminder, Amendment 3, which was approved in 2017 and implemented in 2018, is the most current management document that the fishery operates under.

For notable changes, as most of you I'm sure are still aware. The Chesapeake Bay cap was exceeded in 2019, and to account for that overage, the cap was adjusted for the 2020 fishing season down to 36,000 metric tons. But after 2020, where the reduction fishery finished below that cap, it was returned to 51,000 metric tons, as outlined in Amendment 3. For 2021 it is back at the normal level. Just another reminder that the new TAC for the 2021/2022 fishing season is 194,400 metric tons, based on the Board approved ecological reference points or ERPs.

Moving on to 2021 landings. The total commercial Atlantic menhaden landings, including directed - incidental catch/small scale fisheries and episodic event set-aside or ESA landings, are estimated at 195,092 metric tons, or about 430 million pounds, which is an approximate 6 percent increase relative to 2020, and 0.36 percent over that new TAC, which as mentioned is 194,400 metric tons, or about 428.6 million pounds.

However, the non-incidental catch fishery landings, so that would be directed landings plus ESA landings. Total is estimated at 189,343 metric tons, or 417 million pounds, which is also a 6 percent increase from 2020, and represents about 97 percent of the coastwide commercial TAC. Landings from the incidental catch fishery are estimated at 5,750 metric tons or 12.7 million pounds, which is a 9 percent decrease from 2020, and do not count towards the coastwide TAC.

Next to look at the reduction fishery, the 2021 harvest for reduction purposes is estimated at 136,690 metric tons, or 301.3 million pounds, which is a 10 percent increase from 2020, and 0.06 percent or less than 200,000 pounds above the previous 5-year average of 136,614 metric tons. Omega Protein's plant in Reedville, Virginia is still the only active menhaden reduction factory on the Atlantic coast.

In the Chesapeake Bay, Amendment 3 implemented a 51,000 metric ton harvest cap, as I mentioned. The reported reduction landings from Chesapeake Bay in 2021 was about 50,000 metric tons, or under the cap by approximately 1,000 metric tons. This figure shows landings from the reduction bait sectors through time.

Reduction landings are using the left-hand access, and bait landings on the right-hand access, so please know that they are different scales. Reduction landings are an order of magnitude larger

than bait landings. But generally, reduction landings have been declining over time, and relative to last year bait landings had a slight drop, and reduction landings had a slight uptick. But the overall trend remains fairly consistent. Next is a breakdown of the incidental catch or small-scale fisheries landings. As I mentioned previously, incidental catch landings in 2021 are estimated at 5,750 metric tons, or 12.7 million pounds, which is a 9 percent decrease relative to 2020. Maine, Massachusetts, Rhode Island, Connecticut, New York and New Jersey all reported incidental catch landings, about 88 percent of which were for purse seines, and 9 percent from gillnets.

Maine counted for 96 percent of the total incidental catch fishery landings in 2021, and incidental catch trips were lower than trips in 2020, but still higher than from 2016 through 2019. For the EESA, landings were 2,213 metric tons, or 4.9 million pounds. Maine, Massachusetts and Rhode Island were the only participating states.

Their combined landings were over the total set-aside by about 592,250 pounds. But transfers or donations to the EESA in November and December of last year and April of this year were enough to cover the overage, so there will be no overage going into 2022 fishing season. This last slide is just to demonstrate the quota performance, in terms of number of transfers.

Quota transfers remain high for the 2021 fishing season. There were 17 instances of quota transfers, sometimes involving multiple states, which was one more than last year at 16. That is all I have. Are there any questions before we move on to discussion of the Addendum?

CHAIR BEAL: Great, any questions here in the room or online? I've got one question. Allison Colden, go ahead.

DR. ALLISON COLDEN: I just want to clarify; I have a clarifying question. James, you said the total landings were over the TAC by 0.36 percent, and that the incidental catch does not count towards the TAC. However, the directed harvest was below the TAC. Can you tell me where exactly the overage is coming from?

MR. BOYLE: Yes, so the overage, because it doesn't count toward the TAC maybe it's not quite right to use the word overage, because it is the incidental catch that puts it over the TAC. Technically, the directed landings plus the EESA are under the TAC.

DR. COLDEN: Okay, so it's the addition of the incidental catch that puts the total landings above the TAC for this year.

MR. BOYLE: Yes, that's correct.

DR. COLDEN: Thank you, for the clarifying question.

CONSIDER DRAFT ADDENDUM 1 TO AMENDMENT 3 FOR PUBLIC COMMENT

CHAIR BEAL: Great, other hands either online or here in the room. All right, seeing none, we will jump into Draft Addendum I to Amendment 3. Good news, we only have one more agenda item, so we're in good shape. With that, Toni is going to give the majority of the presentations on the status of things. Essentially a report out from the PDT. With that, if you're ready to go, Toni, it's all yours.

MS. TONI KERNS: Thank you, Mr. Chairman, and I thought I would give James one meeting reprieve before I put him into the thick of things for Draft Addendum I. Please bear with me as I go through the document. What we're going to do is go through it piecemeal today for our discussions.

In your meeting materials you have a memo from the PDT with some recommendations, and I'm going to include those in my recommendations. We'll start with an overview and a timeline. The first piece we'll get to is considering what years of data to include in the Draft Addendum. We'll review the draft options themselves, and then consider action today on what years of data we're going to include.

We'll talk about hopefully removing some options from the Draft Addendum, and then determine

whether or not we're going to consider it for approval for public comment, and the deciding factor of that will actually be the first decision that we make today, on whether or not we include 2020 or 2021 data in the document.

The current timeline for the draft document right now is we have provided some feedback from the PDT from the January, 2022 meeting. The PDT made additional edits based on the Board's feedback over the winter/early spring, and we are considering that feedback and approval for public comment today.

If we do that, then we would have hearings this summer, and consider the document for final approval in August of 2022, which would put us in time for an implementation in 2023, if that is the pleasure of the Board. The first thing that we want to discuss is the landings, and what years of landings that we're going to use in the document.

REVIEW 2020 LANDINGS PROPOSAL

MS. KERNS: In March, additional information was brought forward to the PDT regarding whether 2020 landings were representative, due to the impacts of COVID-19. Specifically, the PDT had heard a proposal from the state of Virginia to allow for adjusted 2020 landings, to account for lost fishing days due to the pandemic.

The PDT was concerned that all states fisheries may not have been impacted by COVID-19, to the extent of which is unknown and possibly variable across the states. Therefore, if the Board was going to allow for adjusted data, then all states should have that opportunity to bring forward proposals. The PDT did not specifically discuss Virginia's proposals, but instead crafted some options for the Board to consider.

But Virginia's proposal had presented the PDT with evidence that their 2020 landings were atypical of the recent time series. Not all states experienced impacts to their fisheries in 2020, and the impacts were disproportional across the states. The PDT noted that addressing this issue could set a precedent for 2020 data for allocation, as well as set a precedent for not using it.

The Menhaden Board may want to consider recommending to the Policy Board considering the utility of 2020 data in management decisions across all species. The Policy Board can consider an overarching policy, although such a policy may be difficult, due to the differing degrees of data collected for each species harvest. The first option would be just to remain status quo, keep the data as is, and use the data through 2020. It would not have any impacts to the timeline, and we could have possible implementation in 2023. Based on discussions with PDT members who have reviewed their state's 2020 data, the PDT has determined that it is an abnormal year for more than one state.

Option 2 is to allow for the adjustment of 2020 data. All states would have the opportunity to present proposals for adjustments to their 2020 landings. This would delay the addendum process, and could impact the Board's ability to implement in 2023. The PDT is concerned about the precedent that this would set for other species, as well as the process to develop standards to review the proposals, and the time to draft and review proposals would be very complicated and a very time-consuming process.

The PDT did not recommend this option. Then the Option 3 is to remove the 2020 data from the time series, because there are concerns with 2020 data it could be dropped, and not be used for any menhaden allocation decisions. This could delay the Draft Addendum by one meeting cycle, but the PDT doesn't anticipate it would delay implementation for 2023. Final action could be taken on the document at the annual meeting, and by removing the 2020 data the PDT is concerned that the data time series would not reflect recent fishing activity.

The most recent year in the document would then be 2019, and that would not be representative of the goals and objectives of the Draft Addendum as currently written. The PDT did not recommend this option. The final option is Option 4, it would be,

remove the 2020 data and add 2021 to the time series. This could delay the Draft Addendum as well by one meeting cycle, while the 2021 data is validated.

But the PDT doesn't believe that this would delay implementation for 2023. By adding 2021 in the time series, it would alleviate the concerns that the PDT has with dropping 2020 data, and adding an additional year in the time series would help reflect the current fishing activity, and this is the preferred option of the PDT. I'm going to pause here to see if there are any questions, and then see if we can have a motion on this to help us move forward with the document.

CHAIR BEAL: Great, thanks. Yes, let's dispense with this decision on how to handle the 2020 data, because it will affect kind of everything else carrying forward in this meeting. We'll tackle this one first. I saw Pat Geer's hand up.

MR. GEER: Yes, I just want to thank the Commission leadership and the PDT for considering this. It was never our intent to delay the implementation of this, but as Toni pointed out, there is more than one state that 2020 was an abnormal year. My personal feeling is that we have to look at those 2020 data for allocations very carefully.

I mean because different states and different sectors within states got impacted differently, it was highly variable. I would hope that we can support Option 4, which seems to be the most straightforward. I am not supportive of delaying this implementation at all, and Option 4 would also give us the most up-to-date data. Again, I would like to just thank the PDT for all the work they did on this.

CHAIR BEAL: Great, thanks, Pat. Other questions on Toni's presentation or the options and sort of process moving forward. Yes, Jim Gilmore.

MR. JAMES J. GILMORE: I understand that logic, Pat, and really the question comes down to, you know we can make arguments about what the best dataset is based upon our personal circumstance. We're once again going down this road that have gone many years before, and we're going to pick some numbers. How are we going to fix it later on if it turns out it disadvantages one state? That is my concern.

I mean what's in here right now will really need to go out to the public. But we're going to get into some sort of allocations that are based upon really, I mean we're talking about data during COVID, and we're making some pretty significant decisions. Let me go back to a statement that was made by my predecessor a year ago. While we'll agree to it now, as long as we can get out of it later, and we never were able to get out of it later. There is my concern.

I'm not that concerned about which one we pick, but when we get new data, we've got to be able to change this, and I don't know if that's how we would do that other than trying to do another addendum. But I don't want to get us into a situation where we make decisions now, and then we have the haves and the have nots and back into that same fight we get into all the time. Anyway, thank you.

CHAIR BEAL: Great, thanks, Jim. Other comments or questions about the options on the board now. Seeing none online and none here. Oh, sorry, Lynn, I didn't see that.

MS. LYNN FEGLEY: That's okay, just really quick. I just feel compelled to put on the record that I think, and certainly COVID is extraordinary, but if next year we have an issue where we have a large hurricane that runs up the coast and it blows closed inlets across the south, because they can't get their fishing fleets out.

You know that is also an extraordinary circumstance. I would just suggest that maybe whatever we decide today, maybe the Policy Board would want to take up some sort of conversation on guardrails going forward, so we're not always in this sort of wondering what is extraordinary and what is not for data impacts.

CHAIR BEAL: Other comments, or are we ready for a motion? Megan.

MS. MEGAN WARE: Yes, I wasn't sure if we were questions or comments right now, because we don't have a motion yet. But I can predict maybe what the motion is going to be, so I'll try and work off of that. I understand why Virginia is putting this forward. I'm not at all disagreeing with the statement that COVID probably had some impacts on that state.

I guess maybe to piggyback off of Lynn's point here, I think COVID may have been atypical, but I don't think it's atypical for a state to not be able to harvest its full quota for one reason or another, whether that's as Lynn mentioned a hurricane, or market conditions, or whatever. I think there is a lot of situations where states can point to an allocation where they said that year in the allocation isn't representative for a reason X, Y, or Z. That is why we use averages. I think if we are going to change the data, I think it's really important for the Board to be clear how this is different than Hurricane Sandy or name some other situation the state has had that's impacted their ability to harvest quota. I'll also say, and maybe this is a question for Virginia. But I guess I'm a little confused about the timing of the proposal. We've been working on the document for, I don't know a year and a half at this point.

I would be curious maybe why it's coming forward now. I think the challenge is states now have both 2020 and 2021 landings. I think it provides an opportunity for states to compare their landings against those two years, and make a decision based for that. I think if we had had the proposal earlier, we wouldn't have had 2021 landings, and it would be a very different context for the discussion. I'm curious to hear more about that, if Pat can answer that.

CHAIR BEAL: Mr. Geer, go ahead, please.

MR. GEER: If you go back to the minutes from any Board meeting or any PDT meeting, we have brought this up at every single meeting. We've talked about our concerns with the 2020 data. It wasn't until I went on a tirade at the last Board meeting in January that leadership, Bob and Spud, approached me and said what is this, what is going on? That's why we put forward the proposal then. We have been bringing this up time and time again, so it wasn't the first time it got brought up.

CHAIR BEAL: Ms. Meserve.

MS. MESERVE: If we're on to comments, I guess I would say that I agree completely with Option 2 and Option 3 not being the path forward for us here. I struggle a little bit with changing the data, because we haven't, the Board at least, didn't see a proposal from Virginia and any of the specifics to justify the reduction in landings.

I guess my question, other than yes, it was COVID, and many states had impacts. They were disproportionate. But I guess my question would be to Toni, perhaps, if the PDT had any discussion about other elements that play in 2020 that could have impacted Virginia's 2020 landings, weather or the reduction of the Bay cap for example, and whether they looked for correlation between those lost days and the landings that resulted.

MS. KERNS: The PDT did not dig too deep into the Virginia proposal, because they one, didn't have a directive from the Board to review the proposal, and two, they were thinking about it more on okay, so if Virginia brings a proposal forward then do we expect proposals from other states.

How do we think about it in the context of the full coast versus the actual proposal itself? I don't recall us asking specifically any of those questions, because again, we didn't even start to dig into the proposal. I don't think that any of that information, I'm trying to remember, was in the proposal that would have sparked those questions right away anyway.

CHAIR BEAL: Tom Fote, please go ahead.

MR. THOMAS P. FOTE: I can understand the problem. When we had Sandy and basically the following spring, when we opened up the fishery

and none of the marinas were open, our numbers were crazy. We were told live with it. I mean we go through the years. But the other problem is you open up that can of worms, where do you start?

We have hurricane events every year, we close ports down, we close inlets down. I mean it's like bluefin tuna has gone through this. We caught the biggest catch of bluefin tuna during a hurricane one year. The numbers are the numbers. The bad numbers, we always know they're bad numbers and we deal with them. But I don't want to start changing in the middle of a thing. I think we should stay where we are.

CHAIR BEAL: Ms. Patterson.

MS. CHERI PATTERSON: I don't like to see any delay of this decision-making process. I understand Virginia's concerns. However, as stated already, there has been other concerns due to natural events that have caused various states issues in the past, in regards to their data or their statistics. I agree.

I think that this needs to go back to the Policy Board, and have a discussion if we do move forward with Option 4, have a discussion how 2020 data can be used in the future, and have the PDT take a closer look at some of these issues that Nichola came up with, to see if there could be some moderation to 2020 data. I don't like the thought of it disappearing.

CHAIR BEAL: Other comments. Yes, Conor.

DR. CONOR McMANUS: There has been a lot of discussion on the removal of 2020 as it pertains to Option 4. I just didn't want to lose sight of the other element of adding 2021 data for the Board's consideration, given that in many ways this aligns with, in my mind, the mission of the Addendum to try and be contemporary of where fish abundance is, and the current fisheries activities. I just would like to have the Board be thinking about both elements, to think about them independently or not may be a different discussion.

But within Option 4, I think adding 2021 data really furthers the Addendum in trying to be consistent with what we're looking at now as a 2023 implementation date. I think adding the data further connects us between the data we're using and reality of when the Addendum could be in effect. I just wanted to bring that to light again in the midst of the holistic Option 4.

CHAIR BEAL: Great, thank you. Other comments, questions. Seeing none; is anyone ready to make a motion? Mr. Clark, go ahead please.

MR. JOHN CLARK: Toni, I submitted the motion up there, and very simple, just want to approve Option 4 for inclusion in the Draft Addendum. Based on the PDT recommendation, I'm assuming, is that the only option that would be in the Addendum, or just in addition to status quo?

MS. KERNS: John, it's not inclusion in the Addendum, **it's how we would actually change the Addendum. I would say just move to approve Option 4: Remove 2020 data and add 2021 data into the Draft Addendum.**

MR. CLARK: Sounds like a plan, that works.

CHAIR BEAL: Is there a second to this motion? Mr. Abbott, thank you. Mr. Clark, do you want to provide any additional background on your motion?

MR. CLARK: Sure, I think the document itself from the Plan Development Team says it all. I think 2020 was extraordinary, and obviously there are problems every year, but this was a first time in 100 years we've had a pandemic like this that has so affected every part of the country, every part of the economy. In particular for a fishery like this, which is not a sport fishery, it's entirely an industrial and bait fishery.

That much more dependent on supply chains and other things happening in the economy. I just think that it just makes a lot of sense for menhaden to go with the 2021 data, and just remove 2020. I understand the precedent it's setting, and that is certainly something that I agree should be discussed

at the Policy Board. But I just think for menhaden in particular that this is the way to go.

CHAIR BEAL: Mr. Abbott, you're all set? All right, David Borden had his hand up online and it's gone down. Mr. Borden, would you like to make a comment now? Your hand is back up, David, so go ahead if you're ready. We'll try to get the microphone sorted out.

MR. DAVID V. BORDEN: I would just like to support the motion. I think John Clark, I won't repeat his points, but I think he made a good point. We're dealing with a one-off event that happens once every hundred years. I also agreed with the point that was made by others about the variable impacts on the states.

The final point I would make is that I have not objections to approving this motion, but then also having the Policy Board take up the general discussion, because I think there is going to be a lot of discussion on some of the other Policy Board matters and species management matters that are going to relate to this. It might be a useful exercise to have a more inclusive discussion of that.

CHAIR BEAL: Just so everyone knows. If this motion were to pass, functionally the way it would operate is, any of the options that are in the draft document 2020 data is pulled out, and 2021 data is plugged in. It doesn't change the range of options, other than just swapping out those two years' worth of data as it functionally will be applied. Senator Miramant, did you have your hand up?

SENATOR DAVID MIRAMANT: Yes, thank you, Mr. Chair and folks. The problem I see with starting that is that with the climate change we're seeing in the Gulf of Maine affecting so many things. Places like Maine or other states could start to say, well we had this affect us. Those incidents seem to be more frequent and more severe. Unless we think that we should start adjusting to every storm that comes along or other issues societally that affects the fisheries, we better just stick with a path that is pretty even handed. If we find real problems with it, we can adjust, but this isn't a real problem to start adjusting for, so thank you.

CHAIR BEAL: Mr. Train, do you have your hand up?

MR. STEPHEN TRAIN: I guess I have a question, and most of you know I spend most of my time on the water, 59 days is a lot of days. Is this, 59 boat days? Was the whole fleet in? Did the factory shut down? I mean there was six months and you were shut down two of them.

MR. GEER: The factory did not shut down. Mr. Diehl is here, if you want to hear from him directly.

MR. TRAIN: I'm just trying to figure out the 59 days is huge.

MR. GEER: It was 59 vessel days.

MR. TRAIN: Vessel days, so one boat 59 days out of the eight, well not all eight boats.

MR. GEER: Out of a 200-day season.

MR. TRAIN: Thank you.

CHAIR BEAL: I'll kind of move down the line. Mr. Pugh, go ahead, please.

MR. CRAIG D. PUGH: The discussion is not necessarily about weather events. They do come and go often. This is a one-off, because we were instructed not only federally, but by our states also to shut our businesses down. That is what the COVID start was in 2020, was to shut things down. The proof of that is in the pudding, the amount of days that Virginia states. It was a one-off, it is 100-year anomaly. I support the motion.

CHAIR BEAL: Lynn Fegley, go ahead, please.

MS. FEGLEY: I would support the motion. But I do want to make sure that we have had sufficient conversation on the record that this will go forward to the Policy Board to review the concept of how we're going to use 2020 data going forward across

the board, and also how we're potentially setting guardrails on this idea of just removing years.

CHAIR BEAL: I don't want to relate it to this motion, necessarily, but based on the comments around this room, it sounds like bringing something to the Policy Board and having a conversation later this week, or at least starting a conversation, is appropriate. I think that should happen regardless of what happens with this motion.

I don't want to link those two together, but Toni and I will bring that forward to the Policy Board. With that, other comments on the motion? Seeing none; are we ready to caucus? All right, we'll do a two-minute caucus, because I realize some folks aren't necessarily in the room. Does anyone need more time to caucus, is everybody all set? Massachusetts, are you guys, okay? You're all set. Okay, I just wanted to make sure. Since we are in this kind of hybrid format here, voting is going to be a little bit different than standard in-person voting. What we're going to do is I'll call on hands in favor. Keep those hands up.

Toni is going to read off the state and names associated with each hand, just so the people that aren't here know who is voting in what direction, and then we'll lower those hands and go through the rest of the voting. All those in favor please raise your hand, and keep them up until Toni calls your state name, please.

MS. KERNS: Rhode Island, Commonwealth of Massachusetts, Connecticut, New York, Pennsylvania, Florida, Georgia, South Carolina, North Carolina, Virginia, Potomac River Fisheries Commission, Maryland, Delaware, New Hampshire.

CHAIR BEAL: I counted 14 in favor. Hands down.

MR. CHRISTOPHER WRIGHT: And National Marine Fisheries Service, Bob.

CHAIR BEAL: Okay, I'm sorry, Chris, which way is National Marine Fisheries Service voting, Chris, in favor?

MR. WRIGHT: Yes, please.

CHAIR BEAL: Great, thank you. All right, with that vote I counted 15 in favor. Any states or jurisdictions in opposition, please raise your right hand.

MS. KERNS: Maine.

CHAIR BEAL: Any others, seeing no other, any null votes, n-u-l-l?

MS. KERNS: New Jersey.

CHAIR BEAL: Any abstentions? Seeing none; that motion carries 15 in favor with 1 vote in opposition and 1 null vote. Thank you, and Toni, are you ready to carry on to the next elements of the Addendum?

MS. KERNS: Yes. As it stands the document has 48 options in the Addendum, 27 of those options are allocation options, 5 of them are episodic events options, and 16 are incidental catch, small scale fishery options. Several of you have been on webinars that we've had recently for striped bass and summer flounder, scup, and black sea bass, where the public has noted that the length of the document or the notions that are being contained in the document have been difficult for the public to follow along, and comment on our documents.

With 48 options, 27 of those being allocation, I fear that we will continue the pattern of making it difficult for the public to follow along. The PDT is very concerned with the number of options that we have in the document, and is hopeful that the Board will remove some of the options, in particular some of the allocation options, so it makes it easier for the public to follow and understand and make comments on the Addendum. Staff also pleads for that from the Board. Thank you for my indulgence of my double-duty of staff and PDT member. Moving forward.

As a reminder of the objectives of the allocation section of the document, it's to align with recent availability of the resource, to enable states to maintain current directed fisheries with minimal

interruptions during the season, and to reduce the need for quota transfers and to fully use the annual TAC without overage.

The PDT used the same two-step approach as outlined in Amendment 3. We first consider the fixed minimum allocation, and then second allocate the remaining TAC based on timeframes. Just as a reminder to the Board that when we do the allocation, the episodic event allocation comes off the top, and then we set the individual state allocations, just as a quick reminder. That got a little confusing last time.

Thinking about the fixed minimum approaches. The PDT developed the options to reduce the amount of TAC that was reserved for the minimum allocation, while still allowing states to acquire the necessary allocation when combined with the second step allocation. At the last meeting the Board moved Florida and Delaware from Tier 1 into Tier 2 of Option 3, but they left those states in Tier 1 in Option 2.

These states were placed in the lowest Tier by the PDT, because the 0.1 percent minimum, when combined with Step 2 and the incidental catch/small scale fishery options would provide sufficient coverage to the minimal amount of landings these states have landed over the last 12 years. In addition, by altering these options it results in no significant difference in the minimum allocation between the two options.

The PDT is recommending either restoring the original options or removing one of the two. The other thing that the Board moved was New York went from the second tier into the third tier of Option 3. The PDT is concerned that the Board misunderstood the overall outcome of the fixed minimum approach.

Under the original options there were very few instances of lower tiered states exceeding their allocations at the end of the allocation process. However, those states that did come up short, which is very minimally short, would be made whole under the additional provisions of the Plan, so thing like the incidental catch/small scale fishery.

The states that do come up short do not have high volume landings, thus would be able to land using incidental catch and small-scale fisheries, even if they were restricted by this document. Then for the second step of the allocation, we have the first option is status quo, and Option 2 are pretty straightforward.

It's just the average landings from the timeframes listed, status quo is using 2009 to 2011, and Option 2 is just using the most recent three years. It will be 2018, 2019, and 2021, based on the action just taken by the Board. It reflects recent landings stock distributions, but obviously does not take into account historical. For the weighted timeframe allocations, the PDT is recommending removal of Timeframe Number 2. The Board had previously requested two versions of the weighted allocation timeframe be developed. While the state allocations vary slightly between the two options, they are conceptually the same. By having two options it increases the number of options in the document, and so the PDT reiterates its recommendation that Timeframe 2 be removed, because it achieves the same objective, and Timeframe 1 utilizes the original time series from Amendment 3, plus the most recent three years.

The bright yellow circle is the one the PDT is recommending removal, 3B. Then the other option for the second step of allocating is the moving average. In response to the Board's concern about the types of landings that can affect the moving average, the PDT split Option 4 into three sub-options, 4A through C. The PDT drafted two new options based on the Board feedback.

Option 4A represents the original moving average method that includes all catch types, including the episodic events and the incidental catch/small scale fishery landings to most accurately reflect the distribution of the stock and effort. The PDT continues to support the retention of this option, as it is the most responsive to the current fishery.

But if the TAC is exceeded it could impact the states that utilize their full quota. Option 4B, which is a new option for the Board, only uses landings under or equal to the TAC in the moving average calculation. It recognizes the importance of incidental catch/small scale fishery and episodic landings, and a state's total landing where there is extra fish available, such as when a state does not achieve its allocation due to low availability or low market demands.

However, it doesn't reward states for activities that could lead to overfishing, meaning exceeding the TAC and/or damage, existing markets and other states, by shifting quota from states that fully utilize their allocation. Proportional allocations of those two types of landings, the incidental catch, small scale fishery and episodic, among participating states eliminates concerns about differences in timing and availability of the extra fish when it might be available.

The PDT supports retention of this option, as it adds protection for states that fully utilize their fishery. But it doesn't represent the current fishery as well as Option 4A does. Option 4C is an option that the Board asked the PDT to put together. It eliminates incidental catch, small scale fishery landings and episodic landings from the calculation of the moving average.

This limits the average to landings acquired under state's annual allocation or quota transfers only. As written the option no longer achieves the purpose of the moving average by inaccurately representing a state's landings. Using such a limited amount of data in the calculations would not allow for movement of quota in any meaningful way, and would not meet the goal and objectives of the Addendum.

In addition, the PDT sees the three-year timeframe of the average as sufficient in eliminating the outside influence of a single year, and presenting a race to fish. That was one of the concerns that the Board had raised for putting this option together at the last meeting. The PDT recommends removal of Option 4C. I can go through, if the Board would like, all the tables that go along with this document. But I recognize they are pretty hard to see. They are in the document, and so I think I'm going to skip it and just see if we have any questions for me on the allocation part of the Addendum.

CHAIR BEAL: I guess first question is, given how hard these numbers are to see, you know is there value in going through step by step through all these different options? They really are unchanged from the January meeting. They are in your document probably a lot easier to read in your document, and if we don't have to go through them it would save us a lot of time. But if there is a need, we can do it.

MS. KERNS: In addition, they will change now the 2020 data is out and '21 data will be in.

CHAIR BEAL: Yes, exactly. In the slides that Toni just presented, anywhere it said 2020, view that now as 2021. Not seeing any hands or any interest in going through slide by slide, we'll go ahead and Toni, can you go back to your slide with the tiers on it? Are there questions on how this works, and what the Plan Development Team has recommended, as far as changes and/or removals? All right great, so this is a starting point. Mr. LaFrance, go ahead, please.

MR. ROBERT LaFRANCE: I just have a question. If you could go back to the slide where you had the objectives. Could you just go back to that slide for a second? You had the objectives of what we were trying to do with this Addendum. I just want to get clarification on Number 4, fully utilize the annual TAC without overage.

I think it kind of comes into what this question is going to be about. The way we have it currently is incidental catch and the incidental catch numbers are not included in the TAC. I guess I'm trying to understand how that relates to some of the other things you're taking out. In other words, given that the TAC. When we talk about fully using the annual TAC, are we also including in that bullet there the TAC that is associated with the incidental catch?

It's kind of an in the weeds question, but I'm just trying to make certain when we're talking about the TAC, we're talking about all landings being underneath the TAC. Right now, incidental catch is out, and it may impact some of the other questions is my point. I just raise that as a question, to make certain. I believe when that was put forward as an objective, it was to make certain that all landings were considered under the TAC. That is my point of view, sitting on the Working Group that was our understanding of the TAC.

MS. KERNS: Rob, I think that that could be in the eye of the beholder of the Board member. I will say that the PDTs objective of making changes to the fixed minimum was to turn a lot of the incidental catch/small scale fishery landings into TAC landings, into directed fishery landings. Previously, roughly 8 percent of the quota was allocated under those fixed minimums.

Under the new options I think it's closer to like 5.2 percent would be under the fixed minimum. It does shift some of those landings into directed landings. It is the pleasure of the Board to determine whether or not incidental catch/small scale fisheries are counted in that TAC or not.

MR. LaFRANCE: That's why I raised the question.

CHAIR BEAL: Before I go to the next questions or comment, I had a request to make sure everybody gets pretty close to the microphone when they're speaking, just so everybody in the back of the room and online can hear you. We are broadcasting out, and we want to make sure everybody can hear, so pull the microphones pretty close and speak directly into them if you can.

Other comments or questions, starting with the Tiers probably is a reasonable place, as well as the placement of the states within those Tiers. Any other comments, please? All right, seeing none. There was a PDT recommendation to restore or remove Option 2 or 3. Any takers on that one? Yes, Megan.

MS. WARE: I had sent a motion to staff if they are able to get that up. Awesome, thank you, Maya. **Move to remove Option B, which is the two-tiered fixed minimum approach from Section 3.1.1 in Draft Addendum I**, and if I get a second, I'll provide some rationale.

CHAIR BEAL: Okay, John Clark is that a second? John Clark seconds that, and I'm back to you, Ms. Ware, please.

MS. WARE: I didn't really agree with the PDT that the two-tiered approaches that are left are basically equal in their objective. I don't think we need both, and I'm leaning towards keeping the three-tiered option, because in my mind I think there is a difference between states which have had no commercial fishery to date, and states which have had small commercial fisheries to date.

I think the three-tier option better distinguishes between those two different categories of states. Then I also think at their last Board meeting the Board spent a lot of time working on that three-tier option, so I would rather preserve that work of the Board moving forward.

CHAIR BEAL: John, do you have any follow up comments on the motion?

MR. CLARK: No, Mr. Chair, Megan covered everything well, thank you.

CHAIR BEAL: Super, thank you. Roy Miller, you had your hand up a moment ago online. Do you still want to make a comment, or it was on a different subject?

MR. ROY W. MILLER: No, I had my hand up to second Megan's motion.

CHAIR BEAL: All right, excellent, thank you, Roy. Other comments on the motion that is on the board to remove Option B. All right, seeing none in here or online, is everyone ready to caucus? Maybe a one-minute caucus. We'll see if that's enough time, and then we'll vote on this. All right, any additional time needed to complete your caucuses?

Seeing no hands here or online, let me try this. Is there any opposition to the motion that is on the board? All right, seeing no hands online or here in the room, there seems to be no opposition. Are there any abstentions to the motion that's on the board? All right, seeing no opposition or abstentions, the motion carries by consent. We're making progress. We'll get up the slide with the next issue here in a second. The next two slides kind of relate to each other. The Plan Development Team is recommending removal of Option 3B and 4C, and then there is some consideration for Option 4B as well. It's probably easier to work through these individually, is that right? Let's go back to Option 3B. Is there any appetite for following the recommendation by the Plan Development Team, and considering removal of the Option 3B with the slightly different timeframe from Option 3A is the only difference? The only difference is 2011 and 2012 is included or excluded. Any thoughts or motions relative to Option 3B. Yes, Mr. Cimino.

MR. JOE CIMINO: You could call me Joe, Bob. I have to respectfully disagree with the PDT on this. I think having a longer historical period in a time before we had quotas is important. There is some interannual variability in this fishery. Now with our recent decision, where we're going to have options to include 2021.

Albeit dropping a year, we are bridging a four-year period for the more recent years as well. I still would prefer to see Option 3B, and I do agree that they are very close, so I would be willing to drop 3A. I wanted to put that out there for discussion before a motion comes up.

CHAIR BEAL: Thank you, Joe. Any other comments relative to 3A versus 3B, removing one or keeping both. Ms. Meserve, please.

MS. MESERVE: My preference would be to follow the PDTs recommendation here. I think that the first weighted option clearly builds upon Option 1 and Option 2. Going back to 2012 feels to me like we're re-litigating the decision made in Amendment 2 with those years, and I think that the objective to incorporate more recent history, and that 3A better achieves that.

CHAIR BEAL: Other comments on the difference between these two options? One of the things that is going to complicate the discussion throughout the rest of this meeting is, okay, you don't necessarily know what these options look like, because we don't have the 2021 data included in these two options. Between this meeting and the August meeting, the plan seems to be staff and PDT will put the 2021 data in here.

That is going to change some of the percentages in the associated tables and associated Option 3A and 3B. Not that I want to defer anything until August. But if the Board is not ready to decide between 3A and 3B at this point until they see exactly what the 2021 data does to those different options. One approach would be to wait until the August meeting, see what that looks like and then the Board can go from there. It's up to the group, but just wanted to get that on the record. Ms. Fegley.

MS. FEGLEY: I really appreciate that, and I'm just going to be perfectly honest. Maryland does a little better if we leave 3A and it does a little better if we do the reverse than what we're trying to do. But it's not substantial, but I think it might be helpful to see. It's' nice to make a decision based on the facts, and not necessarily on the numbers. But I think in this case some numbers might just be helpful to keep us all in good faith negotiations.

CHAIR BEAL: Is there another hand? Dennis Abbott, go ahead, please.

MR. DENNIS ABBOTT: Option 2 is an example will read 2018, '19, and 2021 when we revise?

CHAIR BEAL: Yes, that is what it will be, 2018, 2019 and 2021 will be what Option 2 is.

MS. KERNS: I'll, as staff from my original request is just because the PDT did not ask you all to remove something, it doesn't mean that you cannot remove something, because again, even with the few options that the PDT does recommend taking out of

the document. There still are a ton of allocation options in this Addendum.

As you ponder the '21 data when we get it over the summer, I would just suggest thinking really hard about whether or not all of the options are viable options in your minds, and really think about what we're going to take to the public for comment. Even with removing some of the ones that we will, we'll still have, I think at least 15 options in the document, which is still a lot of allocation options.

CHAIR BEAL: Great, Toni, thanks for that reminder. Mr. LaFrance, go ahead, please.

MR. LaFRANCE: Just a question on process. If in fact the staff were to run these both 3A and 3B, at our next meeting we could decide after the numbers were in front of us whether or we would include these to go to the public. I just wanted to get that clarification.

CHAIR BEAL: Yes, that is correct. The Board still has that latitude in August. I guess to follow up Toni's point about paring this down anywhere and any way the Board feels is appropriate. Anything we could take out today will save the PDT some work between now and August. Anything you take out after August will save some confusion and complication at the public hearings.

That's kind of a two-step process here to follow up on Mr. LaFrance's comment. Kind of reset when we get to August, and once you see the final document things can be changed at that point. With that understanding, is there any appetite for a motion on 3A, 3B or Option 1 and 2 at this point, or do you want to see what the final numbers look like when we get back in August?

MR. BOYLE: Sorry to jump in here. I just want to make a quick comment that for Option 3B the later, more recent time series is 2017 to now 2021, was 2020. The length of time series for the old and recent data is the same. It's four years.

CHAIR BEAL: Great, thanks for doing that reminder, Jim, a typo on the slide. I appreciate that. With that, that probably even means more that you want to see what those numbers look like coming forward. I didn't see any hands when I asked for motions. I'm going to assume we'll get the PDT to crunch the new numbers, come up with different tables, and come back in August and do that. Seeing no opposition to that. Toni, do you want to give a quick summary of where we are with Option 4 again, just so everybody is fresh in their mind?

MS. KERNS: Will do. Again, this is just thinking about the moving average. At the last meeting the Board requested an option that took out incidental catch, small scale fishery and episodic landings from the moving average in total. The PDT felt by doing that it no longer achieved the objective of the moving average, so they created a middle ground option, which becomes 4B, which allows for the episodic, incidental catch and small-scale fishery landings to be used up until the TAC, and then anything over the TAC would not count.

States that had incidental catch/small scale fishery landings and episodic landings would be proportional that's below the TAC to be included in their three-year moving average. I recognize that we don't have '21 data, but conceptually if you wanted to remove an option here we could, or not. The PDT has one option for removal, but it doesn't mean that you can't remove more than one option.

CHAIR BEAL: With that; Ms. Fegley, please.

MS. FEGLEY: I have a question about how this might work, 4B. It says that it's only going to consider landings up until the TAC. Maryland, this is a year that is stationary. It doesn't move. We have no ability in our state to go where the fish are. If we get a slug of fish through the Bay, and into our pound nets in October, and the TAC has already been met. Does that mean that we don't get, there is no acknowledgement that we had an appearance of fish in our stationary gear?

MS. KERNS: No, the reviewers, I'll call it the Plan Review Team, would look at all landings that occurred under episodic, incidental catch and small-scale fisheries. Then we would look at each state's

catch proportionately, and then reduce those landings down to whatever the TAC was, and you would get your proportion up to the TAC to count towards your three-year moving average.

MS. FEGLEY: It's poundage, not anything to do with timing.

MS. KERNS: Say the last part of your question.

MS. FEGLEY: It doesn't have anything to do with timing when the fish are.

MS. KERNS: Correct, yes.

MS. FEGLEY: Okay, thank you.

CHAIR BEAL: Other questions or comments on Option 4 or the sub-options, or motions to adjust these.

MR. LaFRANCE: I would just like to be heard in favor of keeping 4C. I recognize that it may be something we want to take out when we go to public. But I do think it's going to be helpful for us to understand the analysis, in terms of the information, to basically take a look at the moving average, just as it relates to the allocations without including the EESA and the IC/SSF. My sense is that that data would be helpful to us in better understanding what we go to the public with.

MS. KERNS: Rob, just so that the PDT understands. I'm trying to see maybe if the PDT can provide you with additional information, because the moving average is trying to reflect the availability of the fish and what states are actually harvesting. That is the goal and objective of the moving average itself. The 4C Option does not meet that goal and objective at all. I'm trying to understand what you are trying to get out of it by keeping it in the document, so the PDT can make sure that they bring that information to you.

MR. LaFRANCE: What I see happening is the information that you have for each state's individual allocations will be what's moving. What I guess I'm trying to make certain is that we understand what the EESA is, it's a percentage. But we don't know what the IC/SSF is in terms of actual poundage.

By taking them out and then comparing those to the actual allocations, we can get a sense as to how that's playing out, and how the moving average would be impacted. What I guess I'm trying to say is the moving average is going to calculate how people catch up with everything, as well as transfers.

The point here is you're capturing, I believe in 4C, any of the transfers that are happening between states, because they are now from one state to another, in terms of how they look. I think it also gives me some sense as to how large, for example we have some data in the report showing how big the incidental catch is in a state like Maine. I want to make certain that we're capturing that as we understand that before we go to public.

MS. KERNS: We won't be able to show you individual incidental catch small scale landings by state, because some states are confidential. I'm not sure we'll be able to achieve the objective that you're looking for. But I guess we'll do our best. I just want to make sure that the Board recognizes that 4C does not achieve the objective of the moving average.

CHAIR BEAL: I've got one comment online, Allison Colden, then I'll come back to the table.

DR. COLDEN: Toni, I'm trying to understand for Option 4B, you know you ran through these options and brought up some of the concerns with the moving average that the Board brought up and the PDT brought up, particularly with respect to incentivizing a race to fish, to possibly bump up a moving average for landings that are included that are above and beyond the directed allocation for a state.

States that remain within their directed allocation and quota transfers losing out over time. I'm looking at 4B and relating back to Lynn's question. Even if it's based on a proportion of landings, it's

still the proportion of landings above and beyond an individual state's directed allocation. I guess my question is, I'm not quite understanding how 4B addresses the Board's concerns about "race to fish" and equity concerns between the states. Could you elaborate on that a little bit more?

MS. KERNS: The PDT felt that by being a three-year moving average, a "race to fish" doesn't come into play. If Nichole is online when I'm done answering the second part of your question, if you want to add to that I would be happy to have you do so as my PDT member backup. Then in terms of the equity for the incidental catch/small scale fishery landings, every state would still have the opportunity to catch fish under the incidental catch/small scale fishery through the end of the year, and then it's just proportionately counting the poundage to the total of incidental catch/small scale fishery that would be included in your three-year moving average that is under the TAC. Equity wise, every state would still have the opportunity to catch those fish, and then your landings are just reduced proportional to how much you caught. Well, relative to everybody else.

DR. COLDEN: Just a quick follow up, Mr. Chair.

CHAIR BEAL: Yes, please go ahead.

DR. COLDEN: Thanks for that, Toni. I guess I don't want to beat a dead horse here. I'm trying to imagine this playing out. Say for example you have a state that consistently fully exploits its directed allocation, but has little to no incidental catch or small-scale fisheries landings. At the end of the day the TAC is the TAC, and I guess this again gets to the question of whether or not we're going to land on the incidental catch becoming counted towards the TAC or not.

It's all one pie, and it all has to come out of somewhere. Does that mean that states that are consistently landing under the incidental catch and small-scale fisheries above and beyond their directed allocation would be taking quota away from states that stay within their directed allocation over time?

MS. KERNS: If a state does not fully utilize their TAC, then one may argue that they don't have availability of fish to utilize them. Therefore, a state that now has fish available to them would be getting those fish, which is reflecting the moving average then as the PDT put most accurately reflects the current availability of the fish. Obviously, it would change over time, as each state either does or does not fully utilize their TAC. I don't know if I said that straightforward.

CHAIR BEAL: That's good. All right, other follow up questions. I had Jim Gilmore, Joe Cimino and then Steve Train.

MR. GILMORE: Toni, your response back to Rob before, so I understand that it essentially said that well, the incidental catch in the small-scale fishery, really, we can't get that information. It goes back to the initial objectives of the Addendum was we were supposed to try to really characterize what the actual landings are.

But if we can't get that, so if we can't get it 4C makes no sense, because essentially, we're not going to put data in that. I don't know, that just concerns me, because there has always been that discussion about, well really, what are the landings from that? Are we going to at some point be able to figure that out?

MS. KERNS: We can tell you the overall. It depends on the year. Some years states have confidential data and some years they don't. It depends on the year. We can give you the total coastwide amount. Maybe we might be able to break it out by regions, it depends. But specific to, I can't give you poundage for each state currently.

CHAIR BEAL: Joe Cimino.

MR. CIMINO: I hope James appreciates you sitting on the hot seat all day, Toni. I was first looking at 4C as really being dependent on quota transfers, but then your comment about if a state wasn't able to utilize their entire quota that would suggest something about the moving averages. Then that put 4C kind of back into play for me, unfortunately.

I think overall I could support its removal. But I guess what you were trying to explain in 4B is the importance of a state's percentage of the coastwide landings. Is that really what's going to be the overall formula? It will go beyond TAC; it will be back to sort of how we see these tables with a state's percentage of the coastwide landings.

MS. KERNS: If you're looking at what is the heart of the moving average, and you want it to be at its most optimal use, let's call it. Then you would choose 4A, because that takes all landings from the states and moves quota around on an annual basis, based on where the availability of the fish is.

That takes the TAC, transfers, episodic, and incidental catch/small scale fisheries into play, and it really tells you what a state's quota is based on availability and the current fisheries, 4 B is going to do that kind of, but it keeps it in check to the TAC, and it's going to proportionally adjust the incidental catch/small scale fishery landings and episodic landings for each of the states. It's almost there but not quite totally there.

CHAIR BEAL: Follow up, Joe, or are you all set? All right, great, thanks. I had Steve Train and then Lynn Fegley.

MR. TRAIN: I have to simplify these things in my mind to make them work. To me this all goes back to the Baltimore meeting, when we started trying to figure out where the fish were going to be and who was going to get it, what it was going to be. No state every wanted to give up quota in any fishery that it had, any more than any fisherman ever wants to give up quota he had, even if he's not catching a fish. What I see is 4A and 4B are the same thing, as far as redistribution of quota, except 4A does it more aggressively, 4C is stay where we are.

We'll have to keep trading stuff, as was just said. I think it's very important to understand that these incidental catch fisheries and episodic event fisheries allow us to show the reflection of the shift in the fishery, and allow us to shift that quota. To lose that option and stick with something like 4C totally doesn't reflect everything we talked about back at the Baltimore meeting when we started. I think it's important that 4C is eliminated and we look at 4A and 4B. Unless I've totally got confused in this discussion.

CHAIR BEAL: How could anyone get confused in this discussion, Steve? Lynn, go ahead please.

MS. FEGLEY: I think Steve and I were going to the same place. First of all, with 4C, I think the issue there is that particularly for these gears that are fishing that don't move, which are incidental. They should be considered almost a sampling gear in this case. They are, you know when the fish are showing up in those gears the fish are there. When the fish are not showing up in those gears they are not there. If you remove those gears from this calculation, you're removing your signal, and what's telling you that the stock is shifting. I just want to be sure that when we're thinking about this that everybody understands, and that is something Mr. LaFrance said that under the incidental, those fish are counted and there is a full accounting of what is being caught. We just might not have the exact information because of confidentiality issues.

But we do know if we're catching fish under the incidental catch provision in Maryland, there is a very clear accounting of every fish that goes into that net. I want to follow that through with, if we're in a situation where we're closing something like a pound net fishery, what we're not going to be starting to count is all of the dead fish that are released from those nets, because we have to shut down.

I just kind of want to make that clear that 4C, and I really do like this idea, because I think it's creative. It's something we haven't done, and it could actually get us into a new place with allocation. I mean these are sort of brutal arguments that we have to have over and over again. If we can figure out a way to get this in here and help the public understand it, I think it would be worth our time.

CHAIR BEAL: Good, thanks, Lynn. Nichola, go ahead please.

MS. MESERVE: I really agree with Lynn's comments. I also see Option 4C as making the fight for transfers a real food fight among the states. There is already a lot of states in the last year who have been trying to negotiate and do things collectively. But if we're relying on solely transfers to document and show moving the distribution, I think 4C may have some unintended consequences for cooperation among the states. **Based on this discussion thus far, I would be willing to make a motion to remove Option 4C. Let's see, it's Option 4C from Section 3.1.2.**

CHAIR BEAL: Great, thank you, Nichola. Is there a second? Steve Train seconded the motion. Any additional support or comments, Nichola?

MS. MESERVE: I don't believe so, thanks, Bob.

CHAIR BEAL: Steve, you're all set as well. Great, comments on the motion. Allison, do you have your hand up on this one or is that left from previous comment?

DR. COLDEN: No, I had my hand up, but it was up before this motion, so I can save it until after you dispense with this motion if you would like.

CHAIR BEAL: You were going to make a comment on a different topic, not relative to this motion?

DR. COLDEN: Yes, a comment on Option 4, but not specific to this motion.

CHAIR BEAL: Okay, let's tackle this motion. Then we'll come back to you. Mr. LaFrance, go ahead.

MR. LaFRANCE: I appreciate everyone's comments, but I would say that I believe that the Option C brackets this question in a way that is worthwhile for further discussion, so I'll probably be a vote no.

CHAIR BEAL: Other comments in favor or in opposition? Ms. Ware.

MS. WARE: Yes, I'm going to support this motion. I agree with Nichola that specifically for Maine, 4C is just a barometer of how successful I am at calling you all to get transfers. It is really not a metric of our landing in any way, and unfortunately those calls tend to happen on July 4th weekend, so depending how patriotic people are feeling sometimes, I'm less successful.

I just don't see how this is really solving our issue. To Lynn's point about small scale landings and incidental being kind of a barometer of changes in the distribution of fish. I think if the menhaden leave New England, the first place we're going to see that is in our small-scale landings. I actually think it's really important to include those in the moving average, because that is going to give us the first tip off that something is really changing in New England.

CHAIR BEAL: Other comments in favor or in opposition. Seeing none in the room and none from the virtual participants, are we ready to caucus? It looks that way. One minute caucus please. All right, any additional time needed for a caucus? Seeing no hands; let's go ahead and vote. Since there were a couple comments that may not necessarily all vote in favor, we'll go ahead and same plan, raise your hands and keep them up until Toni calls your state. All those in favor, please raise your hand.

MS. KERNS: I'll start at the other side to give their arms less time up. New Hampshire, Maine, Delaware, Maryland, Potomac River Fisheries Commission, Virginia, North Carolina, South Carolina, Georgia, Florida, Pennsylvania, New Jersey, New York, Commonwealth of Massachusetts, Rhode Island and Fish and Wildlife Service, I'm sorry and NOAA Fisheries, wrong agency.

CHAIR BEAL: That's 16 votes in favor, like sign votes in opposition.

MS. KERNS: Connecticut.

CHAIR BEAL: Any null votes, n-u-l-l? Seeing none, any abstentions? Seeing none; the motion carries 16 in favor and 1 vote in opposition. Before I go

back to Allison, Toni has a comment to make, and then Allison I'll come right back to you.

MS. KERNS: As my backup, Nichole just reminded me. It's just that for the moving average is that the Board is thinking about how they're reallocating all of the landings. Right now, you're thinking about reallocating all the landings, and the moving average allows you to continue to do so through time, without doing another addendum. That is what one might say the beauty of the moving average, if that is something that you're interested in doing throughout time, without coming back to the table.

CHAIR BEAL: Great, thanks. Allison, go ahead now, please.

DR. COLDEN: I think Toni's comments, just to put another point on this before we move on. Obviously, a lot of these options in this document are intimately connected and dependent upon one another, and this one in particular I think how well it works and what kinds of incentives it creates, and how it will work in reality is based a lot on the options that we will consider later on in the document for incidental catch in small scale fisheries.

There has been a lot of discussion on this option about how this better reflects the distribution of the fish. But I do think there is a distinction to be made between directed fisheries and non-directed fisheries, with respect to reflecting solely the distribution of the fish versus the capitalization of the fisheries.

I do think this is a creative option. I do think it provides an interesting amount of flexibility, which is kind of rare in the allocation context. But I just wanted to flag for the Board that how this will work in reality is going to depend upon a lot of the decisions that we make further along in the document.

CHAIR BEAL: This is kind of a natural break point. I think there are some snacks in the back of the room. It's a couple minutes before 2:30. Let's take about a ten-minute break or so, grab some snacks and get up and stretch, and we'll come back at 2:40.

(Whereupon a recess was taken.)

CHAIR BEAL: All right, we'll go ahead and bring the Atlantic Menhaden Board back together, and Toni is going to jump into the episodic event set aside section of the Draft Addendum. Go ahead, Toni, when you're ready.

MS. KERNS: Thank you, Mr. Chairman. As a reminder to the Board, the objective of the episodic even set aside program, or the options in the Addendum for episodic, is to ensure sufficient access to the episodic changes in regional availability, in order to minimize in-season disruptions, and reduce the need for quota transfers and incidental catch/small scale fishery landings.

For clarity, the options related to the timing of establishing the episodic set aside have become sub-options in this management section. The sub-options would allow the Board to decide how the set aside could be adjusted, either as a static value during final action of this Addendum, or dynamically during specification proceedings.

There are only two main options here, one status quo, the set-aside would be 1 percent. The other option is that the Board could increase the set-aside up to 5 percent. You would either set a value through final action, it could be anywhere between 1 and 5 percent or the Board would dynamically set them during specifications.

That could range between 1 and 5 percent each time specifications came up. It can be set either on an annual basis for specifications or on a multiyear basis. Before I noted that this note only applies if a tiered minimum approach, as I had said previously, the minimum allocation under Amendment 3 allocated 8 percent of the TAC to the timeframe, based on the allocation of state quotas. I said before the new three-tiered approach allocates 5.53 percent of the TAC to the minimum allocation. The amount of quota left by selecting this Tier as

2.47 percent and that would be reallocated to the states.

But if we increase the episodic to 2.47 or less that would result in a similar value in pounds being removed from the TAC, prior to the timeframe-based allocations. In Amendment 3, 9 percent of the TAC either went to the episodic or the fixed-minimum approach, if that makes sense. These are the new options. The PDT did not make any recommendations for changes.

CHAIR BEAL: All right, any questions or comments for Toni on these two options under episodic event set aside and/or the comments she made at the end, sort of the interrelationship between the tiers and the episodic event set aside, and how the minimums may change depending on how much is set aside for episodic events.

Any questions on these options, or is everyone comfortable with these two options and two sub-options going forward in the document. Seeing no comments or no hand either real or virtual. I will assume everybody is comfortable with these two options going forward, and the two sub-options for Option 2. With that Toni, carry on to the next topic.

MS. KERNS: Then moving on to the incidental catch and small-scale fisheries. As a reminder, the objective for the options in this document are to sufficiently constrain landings to achieve an overall management goal of meeting the needs of existing fisheries, reducing discards, and indicating when landings can occur and if those landings are part of the directed fishery.

The first part is looking at the timing of the incidental catch and small-scale fishery provisions. This looks at when a state begins fishing under the provision, since it impacts the duration of landings that occur. Right now, Option 1 is status quo, no change, no specific direction on when they occur, except for after the state fishery closes.

As we have noted, in some states they will divvy up their quota to certain gear types, and when that gear type catches its full quota, that gear type can then move into the incidental catch, so they call that a closure under their state regulations, which we do allow for in the plan. Option 2 sort of looks at that and addresses it, so it's clearer and more specific in the FMP.

It looks at allowing states to further divide their state allocations into sector and gear type specific allocations, and then the provision would confirm that once that sector, fishery or gear type specific allocation is reached that sector, fishery or gear type can begin landing under the incidental catch small-scale fishery provision. Option 3 looks at the entire state's allocation has to be met before you can start landings incidental catch small-scale fisheries, regardless if a state allocates their quota out in any way.

Then there is also Option 4 looks at full closure when allocation is met, and no incidental catch small-scale fisheries can occur. Then moving on is the permitted gear types of the incidental catch small-scale fishery. For this we are trying to address the volume of landings under the provisions by removing some gear types that are allowed to catch incidental catch and small-scale fisheries. Option 1 would be no change, continue to allow all the current gear types that are catching IC/SSF landings. Option 2 is to not allow purse seines. All other small-scale and non-directed gears could be maintained. The provision would apply to both small-scale directed gears and non-directed gears, but exclude purse seines. This option is included due to the growth of directed landings from small scale purse seine gears in recent years. Landings from purse seine gears would count against a state's directed fishery quota.

Option 3 would be to only allow non-directed gears in the incidental catch/small scale fishery landings. This provision applies to non-directed gears only. Under Amendment 3 this includes pound nets, anchored bait gill nets, drift gillnets, trawls, fishing weirs, fyke nets and floating fish traps. Then moving on looking at the trip limits for the directed small-scale fisheries and incidental catch.

The goal of these options is to limit the annual volume of incidental catch small-scale fishery landings by reducing the trip limit. Option 1 is status quo. We would maintain the 6,000 pounds for all gear types. It still includes the 12,000-pound provision when you have two people on the vessel. For both options 2 and 3, the proposed change in the trip limit would only apply to small scale directed gears.

Those gear types are listed in the document, but as a reminder they are cast nets, traps, excluding the floating fish traps, pot, haul seines, fyke nets, hook and line, bag nets, hoop nets, handlines, trammel nets, bait nets, and purse seines, which are smaller than 150 fathoms long and 8 fathoms deep. Non-directed gears and stationary multi-gears would still be able to land up to 6,000 pounds of menhaden per trip per day, with two individuals working from that same stationary multispecies gear, and together they can land up to 12,000 pounds.

That could still apply for Options 2 and 3, but the total pounds would just be double what the trip limit is listed. Option 2 being 4,500, double that you get 9,000 pounds. For Option 3, 3,000 pounds. Double that you get 6,000 pounds. I'm going to pause here and see if we have any questions, before we get into the PDT recommendations for the next set.

CHAIR BEAL: Questions on incidental catch/small scale fishery provisions up to what Toni has presented. Jim Gilmore, go ahead please.

MR. GILMORE: Can you go back to the first slide under this?

MS. KERNS: The objective one?

MR. GILMORE: I'm sorry, the next one.

MS. KERNS: Timing.

MR. GILMORE: Yes. Okay that one's fine, go to the next one. Option 3, and I won't put up a motion to take it out yet. For New York we don't have a purse seine. Purse seines are prohibited by law now, so we can't even use them. Our entire fishery is by seine, and now if seine is a non-directed gear, I don't have a fishery anymore. My preference clearly would be to move to take that out, but I would like to have some discussion, to see if there are other states that have a strong opinion about leaving that in.

CHAIR BEAL: Other comments or questions, or response to Jim's comment? I've got Roy Miller online, go ahead, Roy.

MR. MILLER: I have a relatively small point to make concerning the definition of trammel net where they are characterized. I used trammel nets many years ago we used them interchangeably with gillnets. I don't understand why trammel nets aren't listed as SSF type gears along with gillnets.

MS. KERNS: Roy, it was a little difficult to understand. Are you asking why trammel nets were not included in the directed or non-directed fishery?

MR. MILLER: I would classify them the same as anchored or staked gillnets, fixed or floating gillnets.

CHAIR BEAL: Roy, we're having trouble understanding you. Your comments earlier in the meeting were really clear, this one is kind of, it sounds like you're under water a little bit.

MR. MILLER: Let me try again. It's a minor suggestion, but I just wondered why trammel nets weren't classified the same as gillnets, because I used them interchangeably many years ago.

CHAIR BEAL: Roy, you're saying trammel net and what other net?

MR. MILLER: Trammel nets and gillnets are pretty much used for the same purposes.

CHAIR BEAL: Okay, great. No, we were just having trouble hearing you. We will take that question back to the PDT and bring back a response in

August. Is that right, Toni? Thanks, Roy, for that. I've got Lynn Fegley and then Allison Colden.

MS. FEGLEY: Just in response to Jim's query about Option 3. You know that really goes back to the original spirit in 2012 of this provision, which was to figure out a way to handle these gears that are not specifically directed on menhaden, but they are encountering menhaden, and it might be hard to get the menhaden out of those gears if you catch them.

Then you're just going to wind up with a bunch of floating fish, which doesn't do anybody any good at all. I think the reason to leave it in, is because it is sort of the original spirit. But I'm curious about what you said. You said your fishery is now just seine, and if this is chosen then you won't have a fishery. Could you help me understand what you mean by that, how that would play out?

MR. GILMORE: The entire fishery has turned into a shore-based beach seine fishery, and it is completely a beach seine. In fact, we had some out of state permits that would come in, but again, the legislature banned any kind of purse seining. The entire, at least the targeted fishery comes down to being a beach seine. Because of the definition under non-targeted gear, the majority, there is some extra landings, but the vast majority of the landings come from the purse seine. If that option went through, it would close New York's fishery.

MS. FEGLEY: Because you don't have enough quota to cover that fishery, because they would be fishing under your quota, right? I'm just trying to understand how.

MR. GILMORE: Yes, they are fishing under our initial quota or whatever, and then they can go to, yes, it's essentially, they are fishing under our base quota or whatever, and it's the only gear we have, well primary gear. Like we do get some catch I think in gill nets, whatever, but the bait fishing industry in New York that is targeting it is all doing it by beach seine.

CHAIR BEAL: Are you all set, Lynn? All right, great. Allison Colden, go ahead please.

DR. COLDEN: Lynn covered some of this. I have the same question for Jim, because I originally had written down that seine was non-directed gear. I got that clarified, thank you, Jim. You know I think to reiterate Lynn's point, the non-directed gears only is sort of a direct mirroring of Amendment 2, and where this provision initiated or originated.

I think that with respect to the objectives of this Addendum, the whole goal that we talked about previously in today's conversation is to get more of those landings included under the TAC through reallocation to the states in their directed landings. If that is the case then we should be minimizing the amount of landings that are occurring under incidental catch and small scale fisheries, by moving those landings into directed allocations to the states.

Personally, I think there is precedent for Option 3 in Amendment 2 for this fishery, and I think that by keeping it in we can achieve our goals of reducing any regulatory discards, while also achieving the other objectives of the Addendum by working on the directed allocations in other parts of the document.

CHAIR BEAL: Tom Fote.

MR. FOTE: Jim, I'm just curious what the bycatch is. Any observers looking at the bycatch of when they haul seine from the beach? Historically there are a lot of fish sitting underneath it. Usually, they get a chance to escape when you're basically doing it out in the boat and you're purse seining, but when you're just pulling everything on the beach. Because I used to go out to Montauk years ago when I live in New York, and watched when they haul seined for striped bass. There was a lot of bycatches in that. Any idea what the bycatch is in the purse seine fishery?

MR. GILMORE: Again, we don't have a purse seine fishery.

MR. FOTE: I mean a seine fishery.

MR. GILMORE: The seine fishery again, they are targeting. The problem with this is that they are the only gear we have targeting, and so we go through our quota. Then they get to incidental catch, the only gear they have left is beach seine. Maybe a suggestion, instead of eliminating it is to essentially non-directed gears, and beach seines, you know add that in, because we went through this a while ago with our official definitions of gear being targeted versus non-targeted, and we had some kind of squirrely things we did. But if we added that in, then I think that would solve the problem.

CHAIR BEAL: Great, thanks, Jim. See if there are other questions then, you can see if you want to try a motion to do that. Other questions or comments on incidental catch/small scale fisheries. Toni has some additional slides that will summarize the Plan Development Team's recommendations relative to this issue. Any other comments? I don't see any. Jim, I don't know if you want to do it now or you want to hear what else Toni has to say, and then come back to your idea of Section 3.3.2, Option 3.

MR. GILMORE: Why don't we finish Toni's, and then maybe we can do, if we've got another piece, we can do it in one motion.

CHAIR BEAL: All right with that I don't see any other hands here or there, so Toni, you're up.

MS. KERNS: I'm going to start with the PDT recommendations on this one, and it's relative to the section that I'll go over on catch accounting for the incidental catch/small scale fisheries. As a whole the PDT believes that catch accounting options for these fisheries are not effective or efficient, and the goal of the catch accounting approach can be achieved through a combination of the reallocation alternatives and the incidental catch small-scale fishery subtopics, such as gear restrictions and trip limits.

Even after editing the options in this topic, based on the Board direction from the February meeting, the PDTs concerns still remain, and they urge the Board to remove this section in its entirety. Options 2 through 4 would need to operate under considerable time lag, as the landings are not finalized until the fall of the following year.

Under Option 2, the Board would be unable to make timely decisions and take action until two years after the management trigger is tripped. For example, if landings have exceeded the cap, more than 10 percent in 2022, the Board would take action in 2023, and implementation would occur in 2024. Under Options 3 and 4, the proposed adjustments to the TAC or set-aside would similarly not be addressed until two years after an overage occurred.

Additionally, Option 3 could result in more latent quota if the set-aside is not fully used. The Board has indicated that latent quota is an issue that should be addressed through this Addendum, and this option may exasperate that issue. Finally, both Options 3 and 4 could result in overages caused by a minority of states that impact many.

If there is an overage by one or a few states in one year, it would reduce the available set-aside, Option 3, that all states could access, or potentially reduce all state's quotas in Option 4. Additionally, these options could therefore potentially result in constant overage payback cycle, creating a new management problem for the Board. As a reminder, here are the options themselves. The goal of these management options was to create a system where annual incidental catch and small-scale fishery landings are limited, and there is accountability for overages. Under Option 2, landings under this provision shall have a catch cap equal to 1 percent of the TAC. The cap is not a set aside, and landings would still not count against the TAC. Landings are reported by states as a part of the annual compliance reports, and if reported, landings exceeded the cap by more than 10 percent in a single year, or exceeds the cap two years in a row, which would be the trigger.

Regardless of the percent overage, the management trigger is reached, and the Board must take action to reduce the incidental catch/small

scale fishery landings. Option 3, landings under the provision shall count against a 1 percent set aside of the overall TAC set annually at the beginning of the fishing season.

If the set aside is exceeded in a given year, the overage will be deducted on a pound for pound basis from the next subsequent year set aside. For Option 4, the total landings under the provision would be evaluated against the annual TAC. If the total landings exceeded the TAC, the overage would be deducted on a pound for pound basis from the next subsequent year's TAC.

Just to reiterate. If the Board takes additional action through the gear provisions, the trip limit provisions, the PDT is not concerned about the TAC being exceeded through the incidental catch, and they are not concerned about the stock status for menhaden. That is why they are recommending removal of these options, because of the administrative burden and the inefficiencies of the lag that would be caused through these options.

Then the last piece for the incidental catch/small scale fishery management options is to allow access to the episodic at less than 100 percent of a state's allocation. Currently under the Addendum, a state has to achieve 100 percent of its state's allocation before it can declare into episodic events set aside, and under Option 2 a state can begin fishing under the episodic event set-aside once they've landed or projected to have landed 95 percent of their quota.

Under the option a state can participate without having fully utilized their allocation. The 5 percent reserve of the state's allocated quota could then be used, after the episodic set-aside has closed, and allow a state to remain open under the directed landings, rather than proceed directly into incidental catch/small scale fisheries. The process for declaring participation into episodic event set aside would slightly change, but the provisions would be similar.

The topic is included in the Addendum, incidental catch/small scale fishery section, due to the decision-making process for addressing small scale purse seines. This option can only be pursued in the current version of the document if either Option 2, no purse seines, or Option 3, non-directed gears are chosen under the permitted gear types for incidental catch/small scale fisheries.

The PDT notes that allowing states to participate in episodic events when they have 5 percent of their allocation remaining, could lead to fairness and equity concerns, as 5 percent of one state's allocation may be significantly different than another states. Timing and availability of fish among the northern states could exasperate this issue, with one state having access to episodic, while other states still have a large volume of quota remaining, and fish may not have migrated into their state waters yet, and thus not have an opportunity to harvest their quota to opt into episodic. Additionally, several other options in the document, including revising the commercial allocations, and increasing the percentage that can be allocated to the episodic event could alleviate the need for this option, and the PDT recommends removal of this option from the document. That's all I have for this.

CHAIR BEAL: Questions or comments or any reaction to the two recommended removals by the PDT. Let me go to Allison Colden, she had her hand up, and then I'll go to you, Lynn.

DR. COLDEN: I really appreciate all of the work that the PDT has done in considering this section. I know particularly when it comes to the catch accounting section, a couple of the PDT calls I was on there was a lot of deep thought on this. I do appreciate all the thought that went into it.

But I do have to push back a little bit on the recommendation that we remove all of those options. Specifically, Toni brought up a point that I think is included in the memo that there is no concern about the stock status of menhaden, but really ever since, you know two years ago it's not about only the stock status of menhaden.

We're operating under ecological reference points, and our management framework with menhaden

now takes into account its role in rebuilding the ecosystem, in particular our focal species in the ERP model striped bass, which we know is in a rebuilding timeframe right now. To say that we have a TAC that is based on a level that is supposed to support the rebuilding of striped bass.

To say that exceeding that TAC is not an issue, or that there should be no Board action when that occurs is something that I personally can't get behind. I think it's important that we are accountable to that TAC. I mean just earlier today the landings are preliminary obviously, and we'll hear them again in August.

But our 2021 landings are over the TAC. We heard that as we moved on. Granted we have an agenda to get through today, but there was no immediate jump to action going on there. I believe some of the options that are included in this section that account for overages or require a payback. I know the PDT recommended that they are too complicated.

But to be completely honest, to me it sounds like some of the accounting that would be required would be similar or exactly the same as the moving average option that we just approved or discussed earlier this afternoon. I think if we achieve our goals of moving landings into the state allocations, as we're trying to do with other parts of this document, then this shouldn't be an issue. But that doesn't mean that we shouldn't be accountable to the TAC, and we shouldn't keep our eye on the prize, with respect to menhaden's role in the ecosystem.

CHAIR BEAL: Ms. Fegley.

MS. FEGLEY: My question is on these accountability measures. They often default to 2B, which is what the response is. My question is, if there would be a way under Sub-Option 1 to bolster what is happening. Right now, if you default to Sub-Option 1, it says the IC/SSF management trigger is tripped. The Board must take action to reduce those landings. I'm just wondering if we were to have a more general response to a TAC overage. But if we could bolster the language in Sub-Option 1 that would prescribe what the Board will do.

For example, if we have a TAC overage then we would have to consider what gears are allowed in the provision. Consider trip limits permitted under the provision. Consider shortened seasons. I just wonder if that would help alleviate some of the concerns, and that it would really give the Board the latitude to move right away with an action if we see an overage.

MS. KERNS: Lynn, the PDT can add some additional provisions, but moving right away would be difficult, because you wouldn't have that final overage until the fall. I don't believe that would be fast enough for a change in the trip limit overall for all the states administratively. I guess that would be a question to the states.

Just how fast could you move come February? Because I don't think we would be able to give you final overages until February, depending on the timing of the annual meeting. Then would you be able to make a move in your regulations for that current year in February?

CHAIR BEAL: Lynn, are you all set? Great, thanks. The next hand I have up online is Chris Wright. Go ahead, Chris.

MR. WRIGHT: I guess we have at NOAA Fisheries some concerns about eliminating accountability measures of any kind, because we have TACs for a reason. We don't want to go over its total. I think there is an optics issue here too, because we just heard public comment about concerns about having forage fish available for striped bass and what not. But we need to at least have accountability and count things.

This just leaves a bad taste in my mouth, in regards to not having accountability for this fishery. If it's complicated then you need to consider the sector and allocate to that sector. We do it for other fisheries. But I think we have a little bit of concern about eliminating these options from at least public comment at this point. They should at least go out

to the public and the public should have their input on this, so that we can make better decisions.

CHAIR BEAL: Great, thanks, Chris, Toni, do you have a comment?

MS. KERNS: I just want to clarify. It's not that the PDT doesn't think that there should be accountability, it's that the PDT is not concerned that we would be exceeding the TAC, if the Board takes action through other provisions of the plan, thus having a more simplified accountability.

You know right now we have almost unrestricted incidental catch/small scale fisheries landings. This was the first year we exceeded the TAC, and we exceeded it by 0.36 percent. We've been doing this for a lot of years where the TAC has not been exceeded. The PDT is thinking about the ecological reference points when they say they're not concerned at this time, because of what has happened, and because of the potential provisions the Board has the opportunity to put in place through the other sections of this plan. I just want to make sure that it's clear that they are not saying that they don't think accountability is needed. It's that they think it can be achieved in a more effective and straightforward manner in other sections of the plan.

CHAIR BEAL: Mr. LaFrance, go ahead please.

MR. LaFRANCE: I just want to associate my remarks with Allison Colden. I do believe that there are for a lot of reasons that she described, are valuable reasons to keep this catch accounting provisions in. However, listening to what some of the debate has been, I wonder whether some of the options could maybe be restricted.

I understand that perhaps the more complicated of the two options that are up there, Option 2 and Option 3, we are actually looking at a percentage of the annual TAC. It seems to me that Option 4 up there, which I think is now in this one, is actually Sub-Option 3. It does make sense and may simplify the analysis for the public.

But to actually put in there for public comment the notion that this is an issue related to both how much is actually captured and caught under the incidental catch, but also to sort of indicate how that relates to the ecological reference points, I think is a very valuable and transparent for our constituents to understand what's happening here. I understand the desire to try and reduce some of the options, but I do think we need to keep something in, and at a minimum I would like to see up on that screen the status quo option in Option 4 maintained.

CHAIR BEAL: Ms. Ware, go ahead, Megan.

MS. WARE: I'm prepared to make a motion if that is helpful at this time, to kind of get the discussion going.

CHAIR BEAL: Please do.

MS. WARE: I'm not prepared to take out this full section at this time. I think the question of what happens if we exceed the TAC is a fair management question to be asking. But like Rob just mentioned, I am happy to pare down some of these options, because I do get that this section is complicated. I sent a motion to staff to remove Options 2 and 3 on the screen here.

I apologize, I referenced them as Sub-Option 1 and Sub-Option 2, since that is how it's written in the document. When we have that up, I'll read it into the record. **Move to remove Sub-Option 1, catch cap equal to 1 percent of the annual TAC and 10 percent exceedance management trigger, and Sub-Option 2, 1 percent set-aside of the annual TAC exceedance management trigger from Section 2A IC/SSF management triggers,** and if I get a second, I can speak to why I think these options are less optimal than the fourth one.

CHAIR BEAL: Great, is there a second? Rob LaFrance seconds the motion. Go ahead, Megan.

MS. WARE: Again, I'm not prepared to remove the whole accounting section. But I have some concerns with these specific issues, and that's why

I'm willing to take them out. Specifically on the 1 percent set aside of the TAC, I actually agree with the PDT that this could result in some latency, and I think that's counter to what we're trying to do in this document. I'm not a big fan of that option. For both of these, they were looking at 1 percent of the TAC. I think a 1 percent, in my opinion, is somewhat arbitrary, and I think if we exceed 1 percent that doesn't tell me a lot. We could exceed 1 percent and still be well below the TAC, and I would not have biological or management concerns.

But Option 4, which was previously on the screen is focused on exceeding the TAC, and I think that is a better assessment of how our management and our biological reference points are performing. I think one other thing I'll say about the 1 percent set asides or catch caps. I think the idea is that we would kind of set these and evaluate them at the next FMP review, so there wouldn't be active accounting against the 1 percent in season.

I think the reality of the situation is states are going to want to have a sense of what other states may be landing, if they're participating in the small-scale incidental catch provision. I know how complicated it is to administer the 1 percent set aside for the episodic between three states, so I get nervous about the level of communication that may be needed under these options for 15 jurisdictions potentially harvesting here.

CHAIR BEAL: Rob, do you have anything else to add in support of the motion?

MR. LaFRANCE: I can't beat what Megan just said, so thank you.

CHAIR BEAL: All set. Just so everyone knows, for consistency of verbiage here, the slide that Toni had up with the big yellow circle. This is the equivalent of taking out Option 2 and 3 in the slide that Toni had up, so it is very similar to what I think Rob's comments from earlier in the meeting. With that any other comments on this motion, either in favor or in opposition? Joe Cimino.

MR. CIMINO: I have a question before we vote. I guess to Toni. Moving past this Addendum, if we felt like things weren't working or needed to be adjusted, would it take another addendum to get back into the process of fixing this?

MS. KERNS: At this time, yes, unless you want to put a provision into the plan that you could use Board action to adjust some aspect of the incidental catch/small scale fishery. But it would be good to be specific about what aspects you might want to adjust, so that the public understands what provisions could be taken through Board action.

MR. CIMINO: Follow up, Mr. Chair, sorry. If I'm not mistaken, we did something like that when we changed small scale and incidental, right that there is sort of a clause that the Board can take action. Sorry to put you on the spot there, but pretty sure through the Working Group and PDT that we noticed that.

CHAIR BEAL: All right, I think Toni is looking at that but Megan is recalling her previous days at the Commission, and she's saying yes. Megan, can you comment on that?

MS. WARE: Yes, I can look at the exact language, sure, but I think it says something to the effect of if there is a significant increase in that provision the Board can take action to adjust it. But I think that action would still be an addendum, it's not a Board vote.

MS. KERNS: I did look that language up today, and it is through adaptive management, but it is adaptive management in the form of an addendum or amendment. If it's something that the Board is interested in having the PDT explore, then you know the PDT can do that. But again, I would just think it's important that we specify which aspects would be done, and if it were to be changed when it would be changed. I assume it would be during specification process, but that would be to the Board's pleasure.

CHAIR BEAL: You know just editorializing, there is a lot of latitude the Board can set for themselves

through actions that can be done through the specification setting process on an annual basis. But they have to be spelled out really well. There is kind of this threshold, you know it when you see it kind of thing, where if you put too many things in there, we are short circuiting potentially a public comment process, and that sort of thing.

It's a balance in there on what the Board can and can't do, but there is a real need to do things quickly at times, but there is also the need to get public comment when we have the ability and timing to do that. With that I think I see Allison Colden's hand is up, and then we'll go back to the table.

DR. COLDEN: Yes, I just wanted to follow up on Joe's comments and to yours as well, Bob, that the two provisions or the two things that can be changed per Amendment 3 are the trip limits and the gear types included. If we did want to add that in, I would be supportive of that as to things that could be addressed through the spec setting process.

CHAIR BEAL: Great, thanks. Any other?

MS. KERNS: Allison, that would be just for the incidental catch/small scale fishery, just to be very, very clear.

DR. COLDEN: Yes.

CHAIR BEAL: Ms. Meserve.

MS. MESERVE: I do support this motion for the reasons that Megan laid out so well. I do have a question about the remaining sub-option though, which on the previous screen was presented as Option 4, which is if the landings exceed the annual TAC, then there is going to be a management trigger response. Option 4 here has it as the payback provision. However, there is actually two sub-options in the document. One is that the Board must take action to reduce the landings, and the other is that there is a payback provision.

As part of this motion, I kind of want to address what's left, Option 4, and that I don't support the payback provision as one of those sub-options under the next tier of options. I find that a payback provision that doesn't address the root cause of the overage is going to be problematic year over year, potentially. Maybe after we dispense with this motion, I would want to make another motion to eliminate Sub-option 2 from 2B, if I'm interpreting what's left after this option is voted on correctly.

CHAIR BEAL: All set. Other comments on the motion. All right seeing none; one minute for a caucus. I'm going to give this a shot**. Any objections to this motion? All right, seeing none; any abstentions from voting on the motion? Seeing none; this motion carries by consent,** and Nichola, do you want to go back to your thought from a moment ago?

MS. MESERVE: Yes, thank you. With the passage of this option what we're left with is that if the landings exceed the TAC, the management trigger is prompted and there are two options in the document. Again, I don't think the overage payback, Sub-Option 2 addresses the root cause of those landings exceeding the TAC, **and so I would make a motion to remove Sub-Option 2, thank you, staff, pound-for-pound payback from Section 2B, the incidental catch and small-scale fishery management trigger response.**

CHAIR BEAL: Thank you, is there a second to Ms. Meserve's motion? Cheri Patterson, thank you. Any additional comment from what you've already made? All right. Cheri, no. All right, seeing no additional comments from the maker and seconder, are there other comments around the table? I've got Allison Colden online followed by Chris Wright, so Allison, go ahead please.

DR. COLDEN: Maybe this question is for Toni. These two seem like relatively distinct sub-options that don't necessarily have to be mutually exclusive to get to Nichola's concern. I'm just wondering, does the selection of the first sub-option under this option necessarily preclude that overage payback? Could we at the conclusion of this Addendum

process, keep both of these as our management framework moving forward?

MS. KERNS: Meaning?

DR. COLDEN: Instead of choosing between the two, you could do both. You address the root of the issue as well as seeing the year that it happens requiring the overage payback.

MS. KERNS: The Board could, if that was the pleasure of the Board. But if that is the intention of the Board today, then it's best to make that the intention of the Board and make it clear in the document.

CHAIR BEAL: Allison, I think if this motion carries and you take out the pound-for-pound payback concept, then it's no longer available to the Board. The Board fully considered it and removed it. If you wanted that concept to be left in, in combination with Sub-Option 1, I think the Board should tackle that question now, and include this sort of combination of the two sub-options.

DR. COLDEN: Okay. Well, I'm prepared to often a motion to substitute to that regard, if that is the appropriate action.

CHAIR BEAL: Yes. Let me go to Chris Wright, and then I'll come back to you, Allison for that motion if that's okay. Chris Wright, go ahead please.

MR. WRIGHT: I had a similar concern, and if what I think she's going to do is propose to leave that in there in some way, then I would support that, because I think the public should have some option like this that they can comment on.

CHAIR BEAL: All right, Allison, do you have your motion ready to go?

DR. COLDEN: Kind of winging it here. I would move to substitute to add Sub-Option 3 if the IC/SSF management trigger is tripped the Board must take action to reduce IC/SSF landings and the overage will be deducted on a pound for pound basis in the subsequent year.

CHAIR BEAL: All right, Allison, we're perfecting that here. One thing is that the pound for pound basis is really a one-year lag, so it wouldn't be the subsequent year it would be sort of year plus two, just because the data takes a little while to get caught up.

DR. COLDEN: Sure, I was just reading that directly off of the language that is currently in the Addendum.

CHIAR BEAL: Yes, that's a verification we needed regardless. Allison, can you see the motion on your screen? Are you comfortable with that wording?

DR. COLDEN: Yes, it looks good to me, thank you.

CHAIR BEAL: Great, is there a second to Ms. Colden's motion? Rob LaFrance, thank you. All right, Allison. You made some comment, rationale for why you want to make that motion. Do you have anything else to add to that?

DR. COLDEN: No, I think I covered it, thank you.

MR. LaFRANCE: I just want to add that I think this is a tough issue for everybody to deal with, and I think both sides have some value. I think this motion does allow us a little bit more time to think through this question, and clearly when we come back to address this at our next meeting. We can decide which of these two options come in. I hear what Ms. Meserve is saying, I think there is some value in what she's saying. But I also think that this option should be looked at, and we should be thinking about what we're going to do in the event we're over here. That's why I'm supporting it.

CHAIR BEAL: Nichola, do you have a comment?

MS. MESERVE: I think one of the additional problems with the pound for pound payback, now that we have scaled back the options, is that there is no cap or set-aside for the incidental catch/small scale fishery landings. If there is a pound for pound payback, that is going to affect all of the states, as opposed to just those that contributed to that overage. That would be another reason not to

move forward with a pound for pound payback, and why I won't support the substitute.

CHAIR BEAL: Any other comments, we can mix the comments together on Main Motion or the Motion to Substitute. Ms. Fegley.

MS. FEGLEY: Yes, I think like Nichola said, the issue is that we don't really know the way that this is now crafted, where that payback is going to, it doesn't really address that root problem. It doesn't tell us where the pound for pound payback is going to go. I still think what we need to do. I don't know that I can support this motion, which we may be divided as a state and that's okay.

But I think we need to just figure out a way to be more specific on the original motion as to what the Board is going to do if there is an overage. I don't think it's satisfactory to the public to say, hey we're over and we're going to all see that we're over and we're going to nod and move on. I think we need to be able to say, these are the things that we're going to proceed to do. If the public needs reassurance, we're going to actually do something. There is a happy median here somewhere.

CHAIR BEAL: Sorry for the little sidebar between Toni and I. I'll go to Eric Reid; he's going to get us out of this mess.

MR. ERIC REID: No, I'm not going to get you out of anything, Bob. I appreciate the thought though. I'm reading the motion to substitute. My question is about the motion to substitute. It says if the IC/SSF is tripped. What are we tripping? Maybe we are tripping, maybe that's how I'm going to get us out of it. But I don't see the mechanism there, to me that's confusing, and I can't support it because I just don't see what it even actually is going to do. Maybe somebody could clarify that for me.

CHAIR BEAL: I think the intention was if the TAC was exceeded, but I'll let Allison or Rob comment on that, since they made the motion. Rob, go ahead please.

MR. LaFRANCE: I believe it's covered in Sub-Option 3, where it basically says, if you read it. It says exceeded after IC landings to total ladings that occurred in state quotas. You could say the trigger is tripped. That's the trigger I believe that we're referring to.

CHAIR BEAL: We probably need to add that wording, if the trigger is tripped, if that is okay with everyone to make it more clear what we're saying here. With that Joe Cimino, you have your hand up.

MR. CIMINO: I want to speak against this, because I think it creates a dangerous and negative feedback loop, because the corrective action we're taking is to get back to a TAC that's a safe harvest level. But with the penalty we have a moving target that is now lower, and our management action isn't for necessarily that, but to get back to the TAC. If year after year we keep taking these penalties, granted with a two-year delay, I think this has some potential unintended consequences that make me nervous.

CHAIR BEAL: What's the will of the Board here? We've got a substitute motion, a main motion, and then there are a number of suggestions. Joe made some earlier about potentially removing gears and doing some other things that sort of get at this idea of the root problem of why there is an overage in the IC/SSF and those sorts of thing.

I guess the question before the Board is, is everyone comfortable with voting on these motions now, or do we want to sort of pause on these and provide some feedback and guidance to the PDT, since we do have the option of tackling this again in August, and ask them to sort of review his conversation and comment on exactly how some of these things would work, and sort of hybridize some of these ideas that are around the table.

Because I think there are a lot of good ideas, but trying to craft them on the fly when there is some uncertainty. I think that may be what is hanging us up. I don't want to slow down the Board. If the Board is ready to vote let's vote. Making decisions

is always better than not, but if you guys don't think you have enough information to make a decision.

I suggest we may want to consider other paths forward. If you're not ready to vote, we'll just need a motion to postpone these two options. With that, what do folks want to do? Are folks ready to vote, or do you want to do something different? Any hands or any thoughts? Jim Gilmore.

MR. GILMORE: If we sent it back to the PDT what does that do to the schedule, Bob, in terms of finalizing this?

CHAIR BEAL: I don't think it should do anything to the schedule, necessarily. You know the PDT has time between now and the August meeting to work on this, and we could bring it back in August, and theoretically bring it out for public hearing in August, final approval in October, and implement in 2023.

Sending it back to the PDT shouldn't do anything, but it's really up to the group. If you want to vote on just the motion to substitute. All these options are in play, but I think there is some confusion or some reluctance to go too far too fast right now, without full suite of information from the PDT. Mr. Gilmore.

MR. GILMORE: I'm in favor of that option, Bob, to send it back, just because after this motion and we get done with this, then I'm going to have to go back to start modifying the gear, because that really wasn't considered. I think this discussion may help the PDT to refine this a lot more, because I was of the opinion.

I was getting to the point my thought was, maybe we should take the whole thing out, because it was just getting very confusing. We're having trouble understanding it, and you know when we go to hearings, the public is going to go, could you explain it to us, and we're not going to be able to. I think your suggestion is a good one and I support it.

CHAIR BEAL: Toni's got a comment sort of that may help clarify the direction to the PDT, or at least get an understanding where the Board wants the PDT to go.

MS. KERNS: I think it would be helpful if the Board voted on at least the substitute motion, and then maybe we could have a conversation about Lynn's comment about making, well even if you voted on Nichola's as well, about making the actions more toothy, as I think Lynn said. What types of management responses the Board would want the PDT to explore in order to do that?

Then give us an idea of the timeline of when you would want to take those actions, and then the PDT could bring something back? But if we don't vote on these things then the PDT has a lot of range, and that could leave us in a danger zone of not approving the document in August, which that would put us in trouble for timelines. Not to counter what Bob just said.

CHAIR BEAL: Why would you think that? Any other comments or thoughts on a path forward? Ms. Ware.

MS. WARE: I'm comfortable voting on these, because I think the PDT needs some guidance, and I don't want to jeopardize not being able to approve this document by the end of the year. But I'm happy to have more discussion on Sub-Option 1, which I don't think either of these motions are about, as well as Jim's comment about the gears in the other section. I don't think either of these motions are specific to that. I'm comfortable voting on these, and then maybe moving to discussion on those two topics.

CHAIR BEAL: Well, I don't see anyone jumping with their hands up, or anyone online with hands up. I guess in order to not vote on these today we need a motion to postpone until the August meeting. But we can go ahead and vote. Seeing no hands; let's vote. We'll give a two-minute caucus, because this is a little complex, on the motion to substitute.

Is everyone ready to vote? Does anyone need more caucus time? Are they okay? Steve and Megan. All right, good. Seeing no need for an additional

caucus time, I think we'll go ahead and actually vote on this one. I'm not sure I can get a consensus out of the group. With that same voting procedure, hands up until Toni calls your state, please. All those in favor of the motion please raise your hand, motion to substitute, I'm sorry.

MS. KERNS: I have Connecticut and NOAA Fisheries.

CHAIR BEAL: All right, those in opposition like sign please.

MS. KERNS: I'm going to start on this side of the room. Rhode Island, Massachusetts, New York, New Jersey, Pennsylvania, Florida, Georgia, South Carolina, North Carolina, Virginia, Potomac River Fisheries Commission, Delaware, Maine and New Hampshire.

CHAIR BEAL: Any null votes n-u-l-l, 1 null vote from Maryland. Any abstentions? Seeing none; the motion fails, 2 votes in favor, 14 votes in opposition, and 1 null vote.

That brings us to the main motion. Potentially considering removing Sub-Option 2 from Section 2B. Are you ready to vote on that one as well? Do we need to caucus again? All right, one-minute caucus. Mr. Haymans, yes, sir.

MR. DOUG HAYMANS: Mr. Chair, would a motion to table until the next meeting be appropriate for this one, so that the IPT could inform this one?

MS. KERNS: Doug asked if motion to table is appropriate here on not.

CHAIR BEAL: Doug, obviously it's the pleasure of the Board to decide if that would be helpful or not. But if this is tabled, I think some more guidance to the PDT on what exactly they are being asked to work on will be really helpful, regardless of what happens to this motion. If someone wants to table this until the next meeting that's fine. But even with that we need to give the PDT something to work on. Is that helpful, Doug?

MR. HAYMANS: Yes, I was actually asking, because I thought your previous conversation was that you felt like the PDT needed to provide us a little more before we made a decision here. I was sort of asking you that direct question.

CHAIR BEAL: Doug, trying to answer your direct question, which is always good to have direct questions. You know if this motion were to pass, pound for pound payback would be taken out of the document, and the PDT couldn't work on that any more that's out, not to come back in August.

It's really a decision of the Board. Does the Board want more work on some options that may consider pound for pound payback, or do you want to vote this up or down, and pound for pound payback is in or out? But if you want some more clarity on what pound for pound payback means, and when you payback and those sorts of thing, the PDT would need some more time to work. With that, Lynn, go ahead please.

MS. FEGLEY: You know I just want to be clear. I'm not particularly opposed to the concept of a pound for pound payback, but the way this is written right now is, you know the Sub-Option 2 as it is written states that the pound for pound payback, the overage would be deducted from either the set-aside or the overall TAC. We don't have a set-aside anymore, because we removed those options.

I think what we need to ask, is in the event that the incidental catch/small scale fishery causes this quota to go over, what is the most equitable mechanism for a pound for pound payback? Because if it's coming off the overall TAC, then the consequence is you're going to be penalizing states who didn't have anything to do with it. I think we just need to be really clear, and ask the PDT to think through what that pound for pound payback might look like.

CHAIR BEAL: Thanks, Lynn, that is getting towards good guidance for the PDT. Hold that thought and we'll see where we end up here. Allison has her hand up, and then we'll see. It's a little awkward we were kind of mid-caucus apparently, but we're

going to make a comment. But Allison, go ahead please.

DR. COLDEN: Sorry, appreciate another bite at this. I think with respect to the option at it currently exists in the document. You know I think the PDT has made their opinion on this specific option very clear twice. If we're going to send it back to the PDT, I think we need to provide some additional options or additional guidance. I think that's what you've been saying, Bob, and Lynn, maybe you brought up a good point, like we need to provide some additional guidance on alternate tweaks to this that we want them to explore, in terms of feasibility. I just want to go back to a previous comment that I made with respect to how reminiscent this option as written is to our moving average option earlier in the document.

In that option that was put forward by the PDT, you know they had developed a mechanism by which the overage would be proportionally attributed to the states once the TAC is exceeded. Maybe some guidance to the PDT as how they could apply that framework in this regard, which would hopefully alleviate some of the equity concerns that Lynn and others may have, but I'm hoping if this goes back to the PDT, they can explore some ways to make this a workable solution.

CHAIR BEAL: I'll look around the table. If anyone wants to make a motion to postpone or substitute or do anything else, let's do that now, and seeing no hands we'll go back to the caucus that we're sort of in the middle of, and we'll finish that caucus, and we'll go ahead and vote on this. Are there any hands to make a motion to postpone or do anything else?

I don't see any hands, so let's finish the caucus and go ahead and vote on the main motion. All right, is Maryland all set, Lynn? Maryland is all set. It doesn't look like we need any time to extend the caucus, so let's go ahead and vote. We'll do a vote, because again, I don't think those would necessarily be a consensus. Those in favor of the motion to remove Sub-Option 2 from Section 2B, please raise your hand and keep them up.

MS. KERNS: We'll start on the right side this time. New Hampshire, Maine, Delaware, Virginia, Potomac River Fisheries Commission, North Carolina, New Jersey, New York, Massachusetts and Rhode Island.

CHAIR BEAL: Those in opposition like sign.

MS. KERNS: Maryland, South Carolina, Georgia, Florida, Pennsylvania and NOAA Fisheries.

CHAIR BEAL: Any null votes? One null vote from Connecticut. Any abstentions? Shouldn't be any, I think we're out of votes. All right, the motion carries 10 votes in favor, 6 in opposition and 1 null vote.

MS. KERNS: What I heard from the Board, in terms of actions that the Board can take to address the root of the problem is, there is some interest in the Board being able to take action. I am assuming through specifications, but in your discussion please correct me if there is another time that you would want to do this, to look at gear types as well as trip limits. If there are other areas that you would want to consider for changes through Board action during specification, please let me know, so the PDT can explore that.

CHAIR BEAL: Ms. Ware.

MS. WARE: I think for Sub-Option 1, I think that is what Lynn was talking about, in terms of providing more guidance. I think maybe an option is to just reference whatever section it is in the document that has the different tools like the trip limits and the gear types, and say something to the effect of, the Board could consider these tools in Section (fill in the blank) as a potential management response.

I don't want to be too prescriptive, but I'm happy to point to some tools that the Board could consider. In terms of whether it is through Board action, like a specification process or an addendum. I guess I'm a little concerned about the Board action, given how important those incidental small-scale landings have been for some states, and we'll see what happens after this action.

But I can see it being tough for a state to not have a public hearing process on something that maybe is critical to their fishery. I'll put that out there for a concern, and maybe that is something that the PDT can talk about, is the best way to handle public comment on something that could be quite critical to a state.

CHAIR BEAL: Any other thoughts or comments on where to go with this and PDT guidance? Oh, Joe Cimino, sorry.

MR. CIMINIO: No, that was a half-hearted hand. I don't blame you. Just to Megan's point. This is a similar discussion that is going to be had with striped bass. I think a lot of the states have to go back and do have a public hearing process. You know we have Councils or Commissions at the state level that these types of management changes come up again. I don't know if the PDT could do that type of research, how many states would need to do that anyway. But I think a lot of time that process happens just at the state level.

MS. KERNS: I guess, Megan, I know you said you didn't want to limit the Board, but in Board action it tends to be helpful if the public knows what we're talking about. The only two opportunities to change things are the trip limits and the gear types in the document right now.

If those are the only two things that the Board is interested in, then the PDT can just focus on those. But I can ask the PDT If they have any other ideas, and if we do have any, we'll bring them back to the Board for their consideration, unless Lynn, you have an additional end, which is fine for the PDT to think about.

CHAIR BEAL: Lynn, go ahead please.

MS. FEGLEY: I'm back to the payback under specification if there is an opportunity for the PDT to think about. I mean did we just remove all options to discuss that? We did.

CHAIR BEAL: Other thoughts, Mr. Gilmore.

MR. GILMORE: Yes, and just in terms, back to the gear question. If the PDT can look at just, we're using traditional nameplates for things, small-scale fisheries, you know the different categories we used, and they may have to be a little creative. We may have some new categories that are more inclusive. Instead of calling a non-directed fishery, maybe there is a non-directed fishery plus or something, I don't know. Just so we can get around that.

CHAIR BEAL: Jim, that goes back to your beach seine comment earlier. Ms. Meserve.

MS. KERNS: Bob, before we go to Nichola, I'm sorry. Just so it's very clear to the PDT. For these non-directed gears. Jim, I understand that you're looking for the beach seine, but I guess it would be good for the PDT to understand what category of gears are you trying to focus on in these non-directed gear types?

Because if we add the beach seine, I'm assuming the PDT took those as a directed gear type. If the Board is interested in us changing that category, the PDT needs to know what that change is, so that they can think about what other gears need to be included in there or not. I just don't want to focus just on that one gear type if we should be considering others.

CHAIR BEAL: Yes, Jim, follow up.

MR. GILMORE: Yes, that is kind of the complication, because we were talking about, it's called a small-scale fishery, and that's what that beach seine is, but now we're calling it non-directed gear. Then we throw in purse seines, which are massive gear, and a beach seine is being kind of synonymous with a purse seine and its really more synonymous with a smaller gear. Essentially, I don't know what the answer is. It's complicated. Again, using the terminology we use we've gotten into this problem a couple of times.

MS. KERNS: Jim, if I understand the document correctly, and Shanna will correct me if I'm wrong in the back of the room, as a PDT member. But your

beach seines would be allowed under Option 2 of the document. There is an option that would go out for public comment that will allow for those beach seines.

It's only in the non-directed gear type that the beach seines would not be allowed. I don't know if that covers you totally, or if you want your beach seines to be covered under that non-directed gear type as well. Then I think we should change the category names then, perhaps.

MR. GILMORE: I would be concerned, because the motion I was going to put up was that it would be non-directed fishery and beach seines, because that option staying in there eliminates my fishery. If that stays in and we get back here and someone suggested, well, we're going to have a really longer meeting, because we will fight tooth and nail for it. I'm trying to get a simple way to fix it, so it doesn't get to that point.

CHAIR BEAL: Ritchie White, you had your hand up, did you take it down intentionally?

MR. G. RITCHIE WHITE: Yes, I did. That last discussion answered my question, thanks.

CHAIR BEAL: I have Megan and then Lynn, please.

MS. WARE: Just a food for thought, Jim, on your comments there. I think, and Toni can correct me. I think your idea of non-directed gears plus beach seines, I'll call it, would already be in the range of options that is in this document. I think at final action you could make a motion for that, because that is within the range of options. I don't know if that helps or not, but Toni can correct me if I'm wrong about that.

MS. KERNS: If it is the pleasure of the Board at the meeting, it is within the range of the things that we're taking out, so if at the meeting the Board agrees that that is within the range, then the Board can take action on that.

CHAIR BEAL: Lynn, please go ahead.

MS. FEGLEY: I admit, I might have passed out. I blacked out for a minute, but I was really hoping to make a motion back on the directed gear, the timing of the IC and the SSF provisions. We seem to have just gotten through that to accountability, and I hope I didn't miss my chance, but I had a motion to remove an option under there, if I may.

CHAIR BEAL: I don't think you passed out, Lynn, you're still here. We're doing good. We're going to bring that slide back up, and then just so everyone can get a refresher on what that issue is. Is this the one, Lynn? Go ahead.

MS. FEGLEY: I think it's the next one. No, okay go back one. I'm back, I'm back in the timing. We're still in catch accounting. I'm back in timing. There it is, we got distracted by the gear types, I think. If I may. **I did have a motion to remove Option 4, which is the full closure when the allocation is met, and having no IC/SSF provision at all,** and if I get a second, I would be happy to speak to that.

CHAIR BEAL: Great, thanks Lynn, is there a second to that motion? Mr. Cimino, thank you. Back to you, Lynn.

MS. FEGLEY: Again, I appreciate the forbearance of the Board in going back here. But I just for one, I think that this provision, although it may need some adjustment here and there. I think it's so important to many of us around the table, in terms of how we go forward in negotiating this allocation. I would hate to see it go away.

I also just want to, because I'm a broken record, you know this is really essential for us to take, because we don't have the mobile gears, we don't allow any gears to move, so if we don't have this at all and we have to close our fisheries, we're just going to have a lot of dead discards. For that reason, it's very important to us.

CHAIR BEAL: Another reminder, Lynn, some people are saying they couldn't hear you well, so just next time get close to the microphone please. Joe, do you have any comments as the seconder?

MR. CIMINO: Yes, I mean I think it's an important provision for many of the states, and we're talking about a potential option where there is a three-year moving average that decides allocation based on where these fish are moving. I think this provision is going to be more important than ever if that comes into play.

CHAIR BEAL: Are there other thoughts or comments on this motion? Seeing none; do we need a caucus? **I don't see any hands that look like they need to caucus. With that, is there any opposition to the motion to remove Option 4 under Section 3.3.1? Seeing no opposition are there any abstentions? All right, the motion carries by consent.** Thank you, Lynn for bringing that back and not letting us forget that one.

MS. KERNS: Coming back now, Maya to Slide 30. The only other one the PDT had recommended and you know, pleasure of the Board is when you can declare into the episodic event set-aside, whether you have to have achieved 100 percent of your quota, or if you can come in at 95 percent of your state's quota.

The PDT recommended removal based on sort of a fairness and equity when 5 percent of one state quota is left, may be very different than 5 percent of another state, and timing and availability of when fish are available to different states can be quite different.

CHAIR BEAL: Great, any thoughts on following the PDT recommendation to remove Section 3.3.5 about when the episodic event can be harvested? Eric Reid.

MR. REID: I would move to remove Section 3.3.5: Allow access to EESA at less than 100 percent of the state's allocation from the document.

CHAIR BEAL: Is there a second to the motion from Mr. Reid. Mr. Gates, thank you. Any follow up Eric, or new rationale?

MR. REID: I think the PDTs rationale is fine with me, no need to add to that, thank you.

CHAIR BEAL: Matt, you're all set? All right, great. Any need for a caucus or anything else on this motion? All right, seeing none; let's try this as well. **Is there any opposition to the motion that is on the board? Seeing none; any abstentions from commenting on the motion on the board. Seeing none, this motion carries by consent.** Thank you.

MS. KERNS: I just want to say thank you to the PDT members for really helping myself and James out on this. I think I had all of their names listed at the end. Maya had it up before, but thank you to those states that have given us some really wonderful folks. They have done a lot of hard work on this document, in particular to keep me straight, so much appreciated.

CHAIR BEAL: I think that is everything for Draft Addendum I to Amendment 3. The Plan Development Team will do some more work between this meeting and the August meeting. We'll bring the document back, and the Board can consider approval for public comment at that time, and hopefully Mel Bell is able to be here and Chair that meeting that would be great.

ADJOURNMENT

CHAIR BEAL: Is there any additional business to come before the Atlantic Menhaden Management Board today? Seeing no hands the Board stands adjourn. Thank you all for your time.

(Whereupon the meeting adjourned at 4:00 p.m. on Tuesday, May 3, 2022)

From: Pam <jetmember@gmail.com>
Sent: Thursday, July 7, 2022 12:13 PM
To: info <info@asmfc.org>
Subject: [External] Menhaden Fishing

Something has to be done to reduce the amount of menhaden being taken from the Chesapeake Bay….
We live in Vaucluse Shores overlooking the bay, when the Ospreys return in the Spring we see 5 to 8 of them fishing everyday all day, this year has been the worst, the Omaga boats have fished in our bay every day for over a week, even spilling one net that caused dead fish to wash ashore! We now only see one Osprey with small fish, and hardly any pelicans….

This is a disgrace and the company is getting away with it, probably because they are contributing and constantly lobbing Senator's.

I want to know why there is no independent oversight on this Company. Why they are allowed to fish in one area for over a week, emptying the area of fish….why is there no research conducted on the effects on wildlife and other fish that depend on the menhaden…

Something has to be done to reduce the amount of fish being taken by this Company in the Bay..

Respectfully,

Pamela Townsend

ATLANTIC STATES MARINE FISHERIES COMMISSION

REVIEW OF THE INTERSTATE FISHERY MANAGEMENT PLAN

FOR ATLANTIC MENHADEN
(*Brevoortia tyrannus*)

2021 FISHING YEAR

Prepared by the Plan Review Team

Prepared July 15, 2022

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

REVIEW OF THE ASMFC FISHERY MANAGEMENT PLAN AND STATE COMPLIANCE FOR ATLANTIC MENHADEN *(Brevoortia tyrannus)* FOR THE 2021 FISHERY

Management Summary

Date of FMP:	Original FMP: August 1981
Amendments:	Plan Revision: September 1992 Amendment 1: July 2001 Amendment 2: December 2012 Amendment 3: November 2017
Management Unit:	The range of Atlantic menhaden within U.S. waters of the Northwest Atlantic Ocean, from the estuaries eastward to the offshore boundary of the Exclusive Economic Zone (EEZ).
States With Declared Interest:	Maine – Florida, including Pennsylvania
Additional Jurisdictions:	Potomac River Fisheries Commission, National Marine Fisheries Service, United States Fish and Wildlife Service
Active Boards/Committees:	Atlantic Menhaden Management Board, Advisory Panel, Technical Committee, Stock Assessment Subcommittee, Plan Review Team, Plan Development Team, Ecological Reference Point Workgroup
Stock Status:	Not overfished, and overfishing is not occurring relative to the current single-species reference points (2019 Single-Species Benchmark Stock Assessment)

I. Status of the Fishery Management Plan

Atlantic menhaden management authority is vested in the states because the vast majority of landings come from state waters. All Atlantic coast states and jurisdictions, with the exception of the District of Columbia, have declared interest in the Atlantic menhaden management program.

The first coastwide fishery management plan (FMP) for Atlantic menhaden was passed in 1981. The FMP did not recommend or require specific management actions, but provided a suite of options should they be needed. In 1992, the plan was revised to include a suite of objectives intended to improve data collection and promote awareness of the fishery and its research needs.

Amendment 1, implemented in 2001, provided specific biological, ecological and socioeconomic management objectives. Addenda I and V revised the biological reference points for menhaden and specified that stock assessments are to occur every three years. Although Amendment 1 did not implement any recreational or commercial management measures, Addenda II through IV instituted a harvest cap on the reduction fishery in Chesapeake Bay. Specifically, Addendum II implemented a harvest cap for 2006-2010 fishing seasons; before its first year of implementation, Addendum III revised the cap amount to be the average landings from 2001 to 2005 (or 109,020 mt); and Addendum IV extended the provisions of Addendum III through 2013.

Amendment 2, implemented in 2012, established a 170,800 metric ton (mt) total allowable catch (TAC) for the commercial fishery beginning in 2013. This TAC represented a 20% reduction from average landings between 2009 and 2011. This Amendment also used the 2009-2011 period to allocate the TAC among jurisdictions. Additionally, the Amendment established timely reporting requirements for commercial landings and required states to be accountable for their respective quotas by paying back any overages the following year. Amendment 2 also included provisions that allowed for the transfer of quota between jurisdictions and a bycatch allowance of 6,000 pounds per day for non-directed fisheries that operate after a jurisdiction's quota has been landed. Addendum 1 to Amendment 2 allows two licensed individuals to harvest up to 12,000 pounds of menhaden bycatch when working from the same vessel using stationary multi-species gear; the intent of this provision is to accommodate cooperative fishing practices that traditionally take place in Chesapeake Bay. The Amendment also reduced the Chesapeake Bay reduction fishery harvest cap by 20% to 87,216 mt.

Amendment 2 also enabled the Board to set aside 1% of the coastwide TAC for episodic events. Episodic events are times and areas where Atlantic menhaden are available in more abundance than they normally occur. Technical Addendum I to Amendment 2 established a mechanism for New England states from Maine to Connecticut[1] to use the set aside, which includes a qualifying definition of episodic events, required effort controls to scale a state's fishery to the set aside amount, and a timely reporting system to monitor the set aside. Any unused set aside quota as of October 31 is redistributed to jurisdictions on November 1 based on the Amendment 2 allocation percentages.

In 2015, the TAC was increased by 10% to 187,880 mt for the 2015 and 2016 fishing years. In 2016, the Board again increased the TAC by 6.45% to 200,000 mt for the 2017 fishing year.

Atlantic menhaden are managed under Amendment 3. Approved in November 2017, the Amendment maintained the management program's single-species biological reference points until the review and adoption of menhaden-specific ecological reference points (ERPs) as part of the 2019 benchmark stock assessment process. In doing so, the Board placed development of menhaden-specific ERPs as its highest priority and supports the efforts of the ERP Workgroup to reach that goal.

[1] At its May 2016 meeting, the Board added New York as an eligible state to harvest under the set aside.

Amendment 3 also changed commercial quota allocations in order to strike an improved balance between gear types and jurisdictions. The Amendment allocated a baseline quota of 0.5% to each jurisdiction, and allocated the rest of the TAC based on average landings between 2009 and 2011. This measure provides fishing opportunities to states that had little quota under Amendment 2, while still recognizing historic landings in the fishery. States also have the option to relinquish all or part of its quota which is then redistributed to the other jurisdictions based on the 2009-2011 landings period. The Amendment also prohibits the rollover of unused quota; maintains the quota transfer process; maintains the bycatch provision (which was rebranded as the 'incidental catch' provision and applicable gear types were defined) and the episodic event set aside program for the states of Maine – New York. Finally, the Amendment reduced the Chesapeake Bay cap to 51,000 mt, recognizing the importance of the Chesapeake Bay as nursery grounds for many species by capping recent reduction landings from the Bay at current levels.

State	Allocations
Maine	0.52%
New Hampshire	0.50%
Massachusetts	1.27%
Rhode Island	0.52%
Connecticut	0.52%
New York	0.69%
New Jersey	10.87%
Pennsylvania	0.50%
Delaware	0.51%
Maryland	1.89%
PRFC	1.07%
Virginia	78.66%
North Carolina	0.96%
South Carolina	0.50%
Georgia	0.50%
Florida	0.52%
Total	100%

In addition to its Amendment 3 deliberations, the Board increased the TAC by 8% to 216,000 mt for the 2018 and 2019 fishing seasons with the expectation that setting of the TAC for subsequent years would be guided by menhaden-specific ERPs. However, the 2019 benchmark stock assessments and peer-review reports would not be available for Board review until February 2020. As a result, in August 2019, the Board maintained the 216,000 mt TAC for 2020.

In October 2019, the Commission found the Commonwealth of Virginia out of compliance with the Interstate FMP for failing to implement and enforce Section 4.3.7 of Amendment 3: Chesapeake Bay Reduction Fishery Cap (cap). Implementation of this measure is necessary to achieve the goals and objectives of Amendment 3 and maintain the Chesapeake Bay marine environment to assure the availability of the ecosystem's resources on a long-term basis. The noncompliance finding was sent to the Secretary of Commerce who concurred with the Commission's finding and declared a moratorium on Atlantic menhaden fisheries in Virginia waters, effective June 17, 2020 if the correct cap was not implemented. In May 2020, ASMFC withdrew the noncompliance finding as the Commonwealth promulgated regulations to implement the 51,000 mt cap. To account for the 2019 overage, the cap for the 2020 fishing year was set at 36,000 mt.

In August 2020, the Board formally approved the use of ERPs to manage Atlantic menhaden, with Atlantic striped bass as the focal species in maintaining their population. Atlantic striped bass was chosen for the ERP definitions because it was the most sensitive predator fish species to Atlantic menhaden harvest, so an ERP target and threshold sustaining striped bass would likely provide sufficient forage for other predators under current ecosystem conditions. For the development of the ERPs, all other focal species in the model (bluefish, weakfish, spiny dogfish, and Atlantic herring) were assumed to be fished at 2017 levels.

In October 2020, the Board approved a TAC for 2021 and 2022 of 194,000 mt, based on the ERPs approved in August. The new TAC represents a 10% reduction from the 2018-2022 TAC level. Based on projections, the TAC is estimated to have a 58.5% and 52.5% probability of exceeding the ERP fishing mortality target in the first and second year, respectively. The Board is currently in the process of considering Addendum I to Amendment 3, which could modify the state allocation process, as well as the Episodic Events Set Aside (EESA) and Incidental Catch and Small-Scale Fisheries Provision (IC/SSF).

II. Status of the Stock

Atlantic menhaden are now managed by menhaden-specific ERPs as indicated above. The ERP target is the maximum fishing mortality rate (*F*) on Atlantic menhaden that sustains Atlantic striped bass at their biomass target when striped bass are fished at their F target, a measure of the intensity with which the population is being fished, is used to evaluate whether the stock is experiencing overfishing. The ERP threshold is the maximum F on Atlantic menhaden that keeps Atlantic striped bass at their biomass threshold when striped bass are fished at their *F* target. Population fecundity, a measure of reproductive capacity, is used to evaluate whether the stock is overfished. According to the latest assessment results, the 2017 estimate of fecundity, was above both the ERP FEC target and threshold, indicating the stock was not overfished. The next single-species stock assessment update is underway and scheduled to be presented to the Board in August, 2022.

In February 2020, the Board accepted the results of the Single-Species and Ecological Reference Point (ERP) Benchmark Stock Assessments and Peer Review Reports for management use. These assessments were peer-reviewed and approved by an independent panel of scientific experts through the 69th SouthEast, Data, Assessment and Review (SEDAR) workshop. The single-species assessment acts as a traditional stock assessment using the Beaufort Assessment Model (BAM), a statistical catch-at-age model that estimates population size-at-age and recruitment. According to the model, the stock is not overfished or experiencing overfishing relative to the current single-species reference points. Population fecundity in 2017 is above the single-species threshold and *F* has remained below the single-species overfishing threshold (0.6) since the mid-1970s, and below the single-species overfishing target (0.22) since the mid-1990s. The model also found juvenile abundance was low in 2017, while biomass was relatively high.

The ERP assessment evaluates the health of the stock in an ecosystem context, and indicates the *F* reference points for menhaden should be lower to account for the species' role as a

forage fish[2]. The ERP assessment uses the Northwest Atlantic Coastal Shelf Model of Intermediate Complexity for Ecosystems (NWACS-MICE) to develop Atlantic menhaden ERPs. NWACS-MICE is an ecosystem model that focuses on four key predator species (striped bass, bluefish, weakfish, and spiny dogfish) and three key prey species (Atlantic menhaden, Atlantic herring, and bay anchovy). These species were chosen because diet data indicate they are top predators of Atlantic menhaden or are key alternate prey species for those predators.

The ERP assessment indicates the *F* reference points for menhaden should be lower than the single-species reference points, but it also concluded that the final ERP definitions, including the appropriate harvest level for menhaden, depend on the management objectives for the ecosystem (i.e., management objectives for both Atlantic menhaden and its predators). Accordingly, instead of proposing a specific ERP definition, the assessment recommends a combination of the BAM and the NWACS-MICE models as a tool for managers to evaluate trade-offs between menhaden harvest and predator biomass.

III. Status of the Fishery

Commercial

Total commercial Atlantic menhaden landings in 2021, including directed, incidental catch, and EESA landings, are estimated at 195,092 mt (430.1 million pounds), an approximate 6% increase relative to 2020 (Table 1). The non-incidental catch fishery landings (directed landings plus landings under the EESA) total for 2021 is estimated at 189,497 mt (417.8 million pounds) and represents approximately 97% of the coastwide commercial TAC of 194,400 mt (428.6 million pounds). Landings from the incidental catch fishery are estimated at 5,596 mt (12.3 million pounds) and do not count towards the coastwide TAC.

Reduction Fishery

The 2021 harvest for reduction purposes is estimated at 136,690 mt (301.3 million pounds), a 10% increase from 2020 and 0.06% above the previous 5-year average of 136,614 mt (301.2 million pounds) (Table 3; Figure 3). Omega Protein's plant in Reedville, Virginia, is the only active Atlantic menhaden reduction factory on the Atlantic coast. In 2020, the reduction plant was shut down for 3 weeks due to the COVID-19 pandemic. Anecdotal reports indicate that in addition to the pandemic, bad weather may have also contributed to lower harvest.

Bait Fishery

The coastwide bait harvest estimate for 2021 from state compliance reports, including directed, incidental catch, and EESA landings, is 58,403 mt (128.8 million pounds). This represents a 2% decrease relative to 2020 and a 13% increase compared to the previous 5-year average (Table 3; Figure 3). New Jersey (36%), Virginia (26%), Maine (17%), and Massachusetts (8%) landed the four largest shares in 2021. For some states, landings validated by ACCSP differed to some

[2] it should be noted, however, that the conservative TAC the Board has set for recent years is consistent with the ERP *F* target provided in the ERP Assessment

degree from the state compliance report values, resulting in a total coastwide bait harvest of 58,993 mt (130.1 million pounds; Table 2).

Incidental Catch and Small Scale Fisheries Landings

Incidental catch landings in 2021 are estimated at 5,596 mt (12.3 million pounds), which is a 9% decrease relative to 2020 (Table 4). Maine, Massachusetts, Rhode Island, Connecticut, New York, and New Jersey reported incidental catch landings (88% from purse seines and 8% from gill nets) in 2021 (Table 5). Maine accounted for 96% of total incidental fishery landings. The number of incidental catch trips (3,099) was lower than in 2019 (3,113) and 2020 (3,565) but higher than trips from 2016 through 2018 (Table 5).

Episodic Events Set Aside Program

The 2021 EESA quota was 1,944 mt (4.29 million pounds). Maine began harvesting under the EESA program on June 25th and continued until their EESA fishery closed on July 1st. Although, the directed fishery was able to reopen from July 2nd through 16th with the state's acquisition of 4.2 million pounds of quota through six state-to-state transfers. Massachusetts began harvesting under the EESA program on June 18th and closed the fishery on July 16th. Another six quota transfers allowed Massachusetts to continue the directed fishery from July 19th until August 10th. Rhode Island participated in the EESA program from June 8th until July 7th and closed the directed fishery on October 19th, before reopening it from October 22nd until October 25th to utilize a small amount of remaining quota. An estimated 2,213 mt (4.9 million pounds) of menhaden were landed under the EESA fishery (Table 6), which is 592,250 pounds over the set aside quota. In November and December 2021, and April 2022, a number of quota transfers were made to cover the overage (see Table 8).

Chesapeake Bay Reduction Fishery Cap (cap)

Amendment 3 implemented a 51,000 mt harvest cap for the reduction fishery in the Chesapeake Bay. Due to the cap being exceeded in 2019, the cap was reduced to 36,000 mt for 2020 to account for the overage. Reported reduction landings from Chesapeake Bay in 2020 were about 27,700 mt, under the adjusted cap by approximately 9,000 mt. As a result, the cap for 2021 is set once again at 51,000 mt. Reported reduction landings from Chesapeake Bay in 2021 were about 50,000 mt, under the cap by approximately 1,000 mt.

Recreational

Menhaden are important bait in many recreational fisheries; some recreational fishermen use cast nets to capture menhaden or snag them with hook and line for use as bait, both dead and alive. The Marine Recreational Information Program (MRIP) estimate for Atlantic menhaden harvest (A + B1) in 2021 is 3.1 million pounds (PSE of 31.1) which is a 21% increase from 2020 (2.55 million pounds). Please note due to COVID-19 pandemic disruptions to the Access Point Angler Intercept Survey and subsequent gaps in catch records, 2020 catch estimates are based in part on imputed data (i.e. proxy or replacement data from 2018 and 2019). For Menhaden in 2020, the contribution of imputed data to total harvest was 26% for harvest in number of fish and 19% for harvest in weight (pounds).

Additionally, it is important to note recreational harvest is not well captured by MRIP because there is not a known, identified direct harvest for menhaden, other than for bait. MRIP intercepts typically capture the landed fish from recreational trips as fishermen come to the dock or beach. However, since menhaden caught by recreational fishermen are often used as bait during their trip, they are typically not part of the catch that is seen by the surveyor completing the intercept.

IV. Status of Research and Monitoring

Commercial fisheries monitoring

Reduction fishery - The NMFS Southeast Fisheries Science Center Beaufort Laboratory in Beaufort, North Carolina, continues to monitor landings and collect biological samples from the Atlantic menhaden purse-seine reduction fishery. The Beaufort Laboratory processes and ages all reduction samples collected on the East Coast. In addition, the purse-seine reduction fishery continues to provide Captains Daily Fishing Reports (CDFRs) to the Beaufort Laboratory where NMFS personnel enter data into a database for storage and analysis.

Bait fishery - Per Amendment 3, states are required to implement a timely quota monitoring system to maintain menhaden harvest within the TAC and minimize the potential for quota overages. The Standard Atlantic Fisheries Information System (SAFIS) daily electronic dealer reporting system allows near real time data acquisition for federally permitted bait dealers in the Mid-Atlantic and Northeast. Landings by Virginia's purse-seine for-bait vessels (snapper rigs) in Chesapeake Bay are tabulated at season's end using CDFRs maintained on each vessel during the fishing season. A bait-fishery sampling program for size and age composition has also been conducted since 1994. The Beaufort Laboratory, and some states, age the bait samples collected. See *Section VII* for more information on quota monitoring and biological sampling requirements.

Atlantic menhaden research

The following studies relevant to menhaden assessment and management have been published within the last few years:

- Anstead, K. A., K. Drew, D. Chagaris, A. M. Schueller, J. E. McNamee, A. Buchheister, G. Nesslage, J. H. Uphoff Jr., M. J. Wilberg, A. Sharov, M. J. Dean, J. Brust, M. Celestino, S. Madsen, S. Murray, M. Appelman, J. C. Ballenger, J. Brito, E. Cosby, C. Craig, C. Flora, K. Gottschall, R. J. Latour, E. Leonard, R. Mroch, J. Newhard, D. Orner, C. Swanson, J. Tinsman, E. D. Houde, T. J. Miller, and H. Townsend. 2021. The path to an ecosystem approach for forage fish management: A case study of Atlantic menhaden. Front. Mar. Sci. 8: 607657.
- Chargaris D., K. Drew, A. M. Schueller, M. Cieri, J. Brito, and A. Buchheister. 2020. Ecological Reference Points for Atlantic Menhaden Established Using an Ecosystem Model of Intermediate Complexity. Front. Mar. Sci. 7:606417.
- Deyle, E., A. M. Schueller, H. Ye, G. M. Pao, and G. Sugihara. 2018. Ecosystem-based forecasts of recruitment in two menhaden species. Fish and Fisheries 19(5): 769-781.
- Drew, K., M. Cieri, A. M. Schueller, A. Buchheister, D. Chagaris, G. Nesslage, J. E. McNamee, and J. H. Uphoff. 2021. Balancing Model Complexity, Data Requirements,

and Management Objectives in Developing Ecological Reference Points for Atlantic Menhaden. Front. Mar. Sci. 8: 608059.
- Liljestrand, E.M., M.J. Wilberg, and A.M. Schueller. 2019. Estimation of movement and mortality of Atlantic menhaden during 1966-1969 using a Bayesian multi-state mark recapture model. Fisheries Research 210: 204-213.
- Liljestrand, E.M., M. J. Wilberg, and A. M. Schueller. 2019. Multi-state dead recovery mark-recovery model performance for estimating movement and mortality rates. Fisheries Research 210: 214-233.
- Lucca, B. M., and J. D. Warren. 2019. Fishery-independent observations of Atlantic menhaden abundance in the coastal waters south of New York. Fisheries Research 218: 229-236.
- Nesslage, G. M., and M. J. Wilberg. 2019. A performance evaluation of surplus production models with time-varying intrinsic growth in dynamic ecosystems. Canadian Journal of Fisheries and Aquatic Sciences 76(12): 2245-2255.
- Schueller, A.M., A. Rezek, R. M. Mroch, E. Fitzpatrick, and A. Cheripka. 2021. Comparison of ages determined by using an Eberbach projector and a microscope to read scales from Atlantic menhaden (Brevoortia tyrannus) and Gulf menhaden (B. patronus). Fishery Bulletin 119(1): 21-32.

Theses and Dissertations of Potential Interest:

- McNamee, J. E. 2018. A multispecies statistical catch-at-age (MSSCAA) model for a Mid-Atlantic species complex. University of Rhode Island.

V. Implementation of FMP Compliance Requirements for 2022

All states are required to submit annual compliance reports by April 1.

Quota Results

Table 8 contains 2021 state-specific quotas and directed harvest. The final quotas for 2021 account for 1.7 million pounds of quota relinquished by Delaware and the result of 25 state-to-state transfers (Table 9), as well as transfers to the EESA. Quota transfers were generally pursued to ameliorate overages. Based on preliminary 2021 landings and quota transfers through April 2022, no jurisdiction's quota has been adjusted due to quota overage.

The Board set the TAC at 194,400 mt (428.5 million pounds) for 2021 and 2022 based on the adopted ERPs. 1% is set aside for episodic events. States may relinquish all or part of its annual quota by December 1st of the previous year. Delaware relinquished 1.2 million pounds of quota which was redistributed to the states according to procedures outlined in Amendment 3 and is reflected in the 2022 Preliminary Quota (Table 8).

Quota Monitoring

The Board approved timely quota monitoring programs for each state through implementation of Amendment 3. Monitoring programs are intended to minimize the potential for quota overages. Table 7 contains a summary of each state's approved quota monitoring system.

Menhaden purse seine and bait seine vessels (or snapper rigs) are required to submit CDFRs. Maine, New York, and Virginia fulfilled this requirement in 2021. New Jersey did not require purse seine vessels to fill out the specific CDFR but did require monthly trip level reporting on state forms that include complementary data elements to the CDFR. Rhode Island purse seine vessels must call in daily reports to RI DMF and fill out daily trip level logbooks. New Hampshire also does not require the specific CDFR, but does require daily, trip-level reporting from dealers and monthly trip-level reporting from harvesters. Massachusetts requires trip level reporting for all commercial fishermen. Menhaden purse seine fisheries do not currently operate in all other jurisdictions in the management unit.

Biological Monitoring Requirements

Amendment 3 maintains biological sampling requirements for non *de minimis* states as follows:

- One 10-fish sample (age and length) per 300 mt landed for bait purposes for Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, and Delaware; and
- One 10-fish sample (age and length) per 200 mt landed for bait purposes for Maryland, Potomac River Fisheries Commission, Virginia, and North Carolina

Table 10 provides the number of 10-fish samples required and collected for 2021. These are based on the best available 2021 total bait landings data (including directed, incidental, and EESA landings) provided to the Commission by the states. In 2021, Massachusetts, Rhode Island, and Connecticut fell short of the required samples. Massachusetts received a number of quota transfers to extend the fishery on August 5th, but staff were unable to complete the additional monitoring before the fishery closed on August 10th. Due to late reported landings, Rhode Island missed one of the required 5 10-fish sampling events but noted that over the four completed events, 55 fish were sampled from the fishery, as well as an additional 49 from the coastal trawl survey. Connecticut has faced difficulties collecting bait samples and relies primarily on the Long Island Sound Trawl Survey for sampling, which produced 103 age samples and 302 length samples over 139 tows. All other jurisdictions met the biological monitoring requirements in 2021.

The PRT continued to discuss whether a sufficient number of age and length samples are being collected from different commercial gear types as well as regions, and whether substituting samples from fishery-independent sources is appropriate for meeting the requirement. The PRT recommends this requirement be evaluated as part of the next management action or during the next benchmark stock assessment.

Adult CPUE Index Requirement

Amendment 3 requires that, at a minimum, each state with a pound net fishery must collect catch and effort data elements for Atlantic menhaden as follows; total pounds landed per day, number of pound nets fished per day. These are harvester trip level ACCSP data requirements. In May of 2013, the Board approved North Carolina's request to omit this information on the basis that it did not have the current reporting structure to require a quantity of gear field by

harvesters or dealers. In recent years, NC DMF staff have worked to develop a proxy method to estimate effort but this approach likely would not work for developing an adult CPUE index.

De Minimis Status

To be eligible for *de minimis* status, a state's bait landings must be less than 1% of the total coastwide bait landings for the most recent two years. State(s) with a reduction fishery are not eligible for *de minimis* consideration. If granted *de minimis* status by the Board, states are exempt from implementing biological sampling as well as pound net catch and effort data reporting. The Board also previously approved a *de minimis* exemption for New Hampshire, South Carolina and Georgia from implementation of timely reporting. The states of Pennsylvania, South Carolina, Georgia, and Florida requested and qualify for *de minimis* status for the 2021 fishing season.

VI. Plan Review Team Recommendations and Notable Comments

Management Recommendations

- The PRT recommends that the *de minimis* requests from Pennsylvania, South Carolina, Georgia, and Florida, be approved.
- The PRT recommends that the Technical Committee be tasked with evaluating the biological sampling requirement to be readdressed in a future management document or stock assessment.

VII. Literature Cited

Atlantic States Marine Fisheries Commission (ASMFC). 2017. Atlantic Menhaden Stock Assessment Update. Prepared by the ASMFC Atlantic Menhaden Stock Assessment Subcommittee. 180 pp.

Southeast Data, Assessment, and Review (SEDAR). 2015. SEDAR 40 – Atlantic Menhaden Stock Assessment Report. SEDAR, North Charleston SC. 643 pp.

SEDAR. 2020. SEDAR 69 – Atlantic Menhaden Benchmark Stock Assessment Report. SEDAR, North Charleston SC. 691 pp. available online at: http://sedarweb.org/sedar-69

SEDAR. 2020. SEDAR 69 - Atlantic Menhaden Ecological Reference Points Stock Assessment Report. SEDAR, North Charleston SC. 560 pp. available online at: http://sedarweb.org/sedar-69

Table 1. Directed, bycatch, and episodic events set aside landings in 1000s of pounds for 2021 by jurisdiction. Source: 2022 ASMFC state compliance reports for Atlantic menhaden. NA = not applicable; C = confidential (Some states are listed as confidential to protect the confidentiality of other states)

State	Directed	Incidental Catch	EESA
ME	7,501	11,771	C
NH	C	-	NA
MA	7,782	174	C
RI	3,393	C	C
CT	163	C	NA
NY	2,912	310	NA
NJ	45,640	C	NA
DE	C	-	NA
MD	2,801	-	NA
PFRC	2,534	-	NA
VA	334,790	-	NA
NC	419	-	NA
SC	C	-	NA
GA	C	-	NA
FL	111	-	NA

Table 2. 2021 validated bait landings by jurisdiction in 1000s of pounds. C = confidential (Some states are listed as confidential to protect the confidentiality of other states)

State	Bait Landings
ME	22,769
NH	C
MA	9,916
RI	3,575
CT	C
NY	3,570
NJ	45,694
DE	C
MD	2,802
PRFC	2,536
VA	33,441
NC	424
SC	C
GA	C
FL	111

Table 3. Atlantic menhaden reduction and bait landings in thousand metric tons, 1987-2021

	Reduction Landings (1000 mt)	Bait Landings (1000 mt)
1987	310	25.5
1988	278	43.8
1989	284	31.5
1990	343	28.1
1991	330	29.7
1992	270	33.8
1993	310	23.4
1994	260	25.6
1995	340	28.4
1996	293	21.7
1997	259	24.2
1998	246	38.4
1999	171	34.8
2000	167	33.5
2001	234	35.3
2002	174	36.2
2003	166	33.2
2004	183	34.0
2005	147	38.4
2006	157	27.2
2007	174	42.1
2008	141	47.6
2009	144	39.2
2010	183	42.7
2011	174	52.6
2012	161	63.7
2013	131	37.0
2014	131	41.6
2015	143	45.8
2016	137	43.1
2017	129	43.8
2018	141	50.2
2019	151	58.1
2020	125	59.6
2021	137	58.4
Avg 2016-2020	137	50.9

Table 4. Incidental fishery landings by state in 1000s of pounds, 2013-2021. Only states that have reported incidental catch landings are listed. Average total incidental catch landings for the time series is 7.5 million pounds.

State	2013	2014	2015	2016	2017	2018	2019	2020	2021
ME		-	-	506	5,374	2,995	10,751	13,605	11,771
MA								49	174
RI	16	99	70	40	136	-	-	-	C
CT	0	-	10	-	124	-	-	-	C
NY	0	325	769	281	807	-	-	282	310
NJ	0	626	241	196	-	204,240	-	20	C
DE	76	112	92	21	29	-	-	-	-
MD	2,864	2,201	1,950	996	-	-	-	-	-
PRFC	1,087	1,112	455	106	670	-	-	-	-
VA	268	2,232	2,103	326	-	110,281	-	-	-
FL	65	126	302	111	264	-	-	-	-
Total	4,377	6,831	5,992	2,581	7,404	3,215	10,751	13,957	12,336

Table 5. Total incidental landings (1000s of pounds), number of trips, and number of states reporting landings in the incidental catch fishery, 2013-2021.

Year	Landings (1000s of pounds)	Number of Trips	Number of states landing
2013	4,377	2,783	4
2014	6,831	5,275	8
2015	5,992	4,498	9
2016	2,581	2,222	9
2017	7,407	2,108	7
2018	3,310	1,224	3
2019	10,751	3,113	1
2020	13,957	3,565	4
2021	12,336	3,099	6
Total	67,037	27,887	

Table 6. Episodic Events Set-Aside (EESA) fishery quota, landings, and participating states by year. *The 2018 EESA quota was reduced due to an overage in 2017. The 2018 EESA overage was paid back in full by the state of Maine. **The 2021 overage was covered by quota transfers in 2021 and 2022, and there will be no deduction for the 2022 fishing year.

Year	States Declared Participation	EESA Quota (MT)	Landed (MT)	% EESA Quota Used
2013		1,708	-	-
2014	RI	1,708	134	7.8%
2015	RI	1,879	854	45.5%
2016	ME, RI, NY	1,879	1,728	92.0%
2017	ME, RI, NY	2,000	2,129	106.5%
2018*	ME	2,031	2,103	103.6%
2019	ME	2,160	1,995	92.4%
2020	ME & MA	2,160	2,080	96.3%
2021**	ME, MA, RI	1,944	2,213	113.8%

Table 7. State quota reporting timeframes in 2021. The **bold** text indicates which reporting program (dealer or harvesters) the states use to monitor its quotas. Blue text indicates changes from 2020.

State+A2:D14	Dealer Reporting	Harvester Reporting	Notes
ME	monthly	**daily/weekly**	Harvesters must report same day during directed and episodic event trips; harvesters report daily trips weekly for trips <6,000 lbs. Harvest reports are used for quota monitoring.
NH	**weekly**	monthly	Exempt from timely reporting. Implemented weekly, trip level reporting for state dealers.
MA	**weekly**	monthly/daily	Harvesters landing greater than 6,000 lbs must report daily
RI	**twice weekly**	quarterly/daily	Harvesters using purse seines must report daily
CT	**weekly/monthly**	monthly/daily	CT operates as directed fisheries until 90% of the quota is harvested. Then operates at the 6,000 pound bycatch trip limit.
NY	**Weekly**	monthly	Capability to require weekly harvester reporting if needed
NJ	**weekly**	monthly	All menhaden sold or bartered must be done through a licensed dealer
DE	—	**monthly/daily**	Harvesters landing menhaden report daily using IVR
MD	monthly	**monthly/daily**	PN harvest is reported daily, while other harvest is reported monthly.
PRFC	—	**weekly**	Trip level harvester reports submitted weekly. When 70% of quota is estimated to be reached, then pound netters must call in weekly report of daily catch.
VA	—	**monthly/weekly/daily**	Purse seines submit weekly reports until 97% of quota, then daily reports. Monthly for all other gears until 90% of quota, then reporting every 10 days.
NC	**monthly (combined reports)**		Single trip ticket with dealer and harvester information submitted monthly. Larger dealers (>50,000 lbs of landings annually) can report electronically, updated daily.
SC	**monthly (combined reports)**		Exempt from timely reporting. Single trip ticket with dealer and harvester information.
GA	**monthly (combined reports)**		Exempt from timely reporting. Single trip ticket with dealer and harvester information.
FL	**monthly/weekly (combined reports)**		Monthly through the FWC Marine Fisheries Trip Ticket system until 75% of quota is projected to have been met, then weekly phone calls to dealers who have been reporting menhaden landings until the directed fishery is closed.

Table 8. Results of 2021 quota accounting in pounds. The 2021 landings do not include landings from the incidental catch fishery because they do not count towards the TAC. A majority of the 2021 episodic events set aside (EESA) quota was used by Maine with the remainder used by Massachusetts and Rhode Island. There was an EESA overage of about 592,000 pounds that was covered by quota transfers. The 2022 base quotas account for the redistribution of relinquished quota by Delaware (1.2 million pounds).
*Includes redistributed relinquished quota for that year and any overages from the previous season.
^Includes inter-state transfers and transfers to the EESA quota.

State	2021 Base Quota*	Returned Set Aside	Transfers^	Final 2021 Quota	Overages	2022 Base Quota*
ME	2,194,396		5,317,590	7,511,986		2,194,303
NH	2,121,582		2,686,318	4,807,900		2,121,582
MA	5,422,022		2,362,791	7,784,813		5,417,812
RI	2,196,815		1,228,533	3,425,348		2,196,719
CT	2,188,634		-2,000,000	188,634		2,188,548
NY	2,934,618		0	2,934,618		2,933,580
NJ	46,323,661		275,000	46,598,661		46,267,280
PA	2,121,464		-1,086,318	1,035,146		2,121,464
DE	474,821		0	474,821		974,821
MD	8,037,057		-1,000,000	7,037,057		8,029,511
PRFC	4,564,863		-900,000	3,664,863		4,561,747
VA	335,206,390		0	335,206,390		334,781,533
NC	4,065,016		-2,000,000	2,065,016		4,062,537
SC	2,121,464		-1,775,000	346,464		2,121,464
GA	2,121,464		-1,971,164	150,300		2,121,464
FL	2,198,584		-1,400,000	798,584		2,198,486
Total	**424,292,851**			**424,030,601**		**424,292,851**

Table 9. State-to-state transfers of menhaden commercial quota for the 2021 Fishing year.

Transfer Date	ME	NH	MA	RI	CT	NY	NJ	PA	DE	MD	PRFC	VA	NC	SC	GA	FL
1-Jul-21	300,000				-300,000											
1-Jul-21		750,000			-750,000											
6-Jul-21	675,000													-675,000		
6-Jul-21	800,000												-800,000			
13-Jul-21	972,698														-972,698	
14-Jul-21	840,000															-840,000
16-Jul-21				500,000									-500,000			
17-Jul-21			262,500		-262,500											
17-Jul-21			700,000										-700,000			
17-Jul-21				187,500	-187,500											
19-Jul-21				210,000												-210,000
27-Jul-21				300,000										-300,000		
27-Jul-21			525,000											-525,000		
27-Jul-21				243,175											-243,175	
27-Jul-21			405,291												-405,291	
28-Jul-21		1,000,000								-1,000,000						
5-Aug-21				150,000				-150,000								
5-Aug-21	600,000							-600,000								
5-Aug-21			250,000					-250,000								
5-Aug-21			350,000													-350,000
13-Oct-21		500,000			-500,000											
22-Oct-21		350,000													-350,000	
27-Oct-21							275,000							-275,000		
28-Oct-21	900,000										-900,000					
8-Dec-21	350,000			-350,000												
11-Jul-22		86,318						-86,318								
Total	5,437,698	2,686,318	2,492,791	1,240,675	-2,000,000	0	275,000	-1,086,318	0	-1,000,000	-900,000	0	-2,000,000	-1,775,000	-1,971,164	-1,400,000

Table 10. Biological monitoring results for the 2021 Atlantic menhaden bait fishery.
*Age samples are still being processed

State	#10-fish samples required	#10-fish samples collected	Age samples collected	Length samples collected	Gear/Comments
ME	33	38	380	380	36 from PS; 2 from gillnets
NH	7	7	70	70	Purse Seine
MA	15	13	130	130	all purse seine
RI	5	4	55	55	Otter Trawl, Floating Fish Trap
CT	1	0	103	302	Long Island Sound Trawl Survey - 139 tows in 2021
NY	5	14	127	147	cast net, seine net
NJ	67	109	*	1090	Purse Seine
	3	0	*	0	Other Gears
DE	1	1	10	10	Gill net
MD	6	30	417	1323	Pound net
PRFC	6	13	130	130	pound net
VA	7	55	55	55	Pound Net
	5	200	200	200	Gill Net
	0	20	20	20	Haul Seine
NC	1	6	55	92	gillnet
Total	**163**	**510**	**1752**	**4004**	

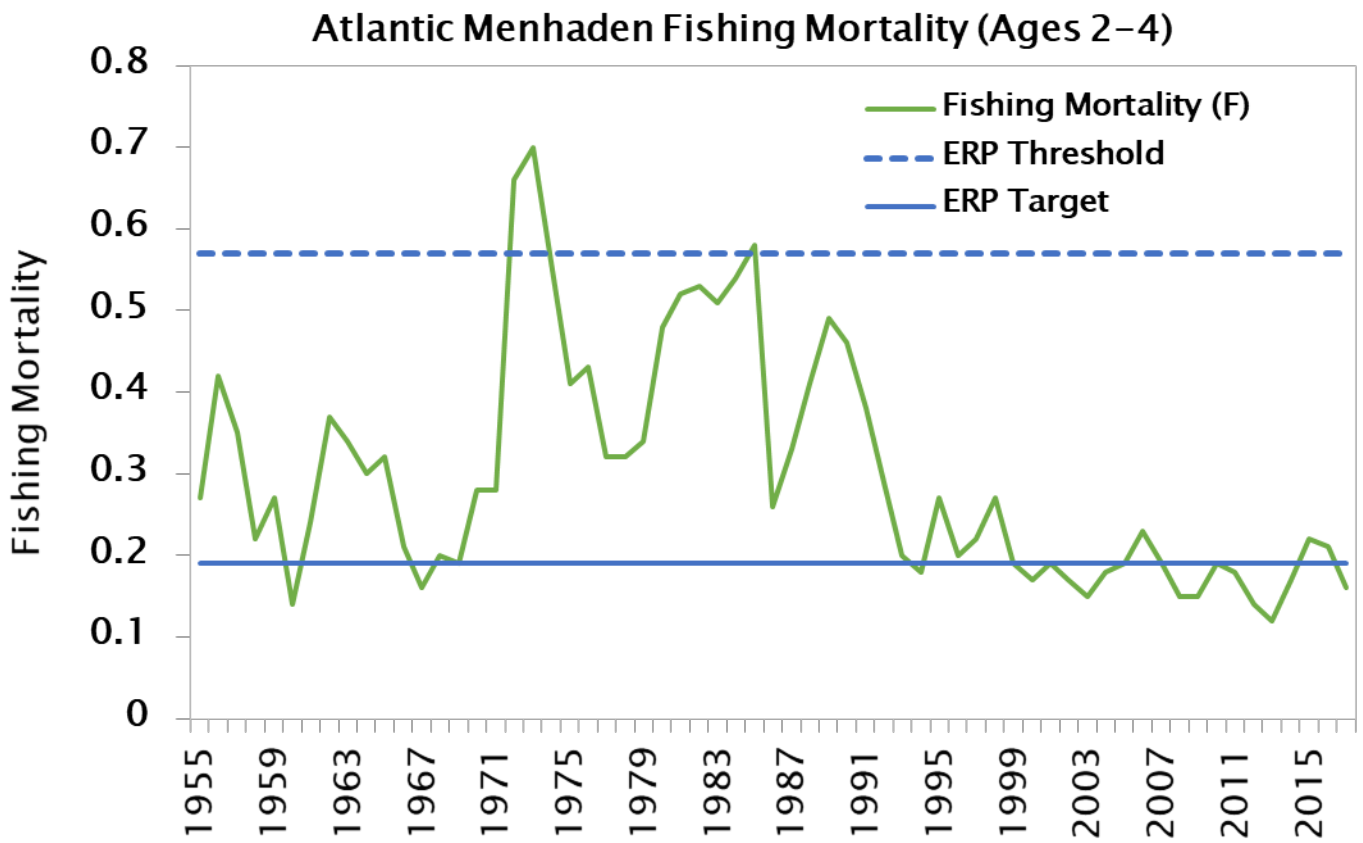


Figure 1. Fishing mortality, 1955-2017. The ERP fishing mortality reference points are F_{target} = 0.19 and $F_{threshold}$ = 0.57. F_{2017} = 0.16. Source: ASMFC 2020.

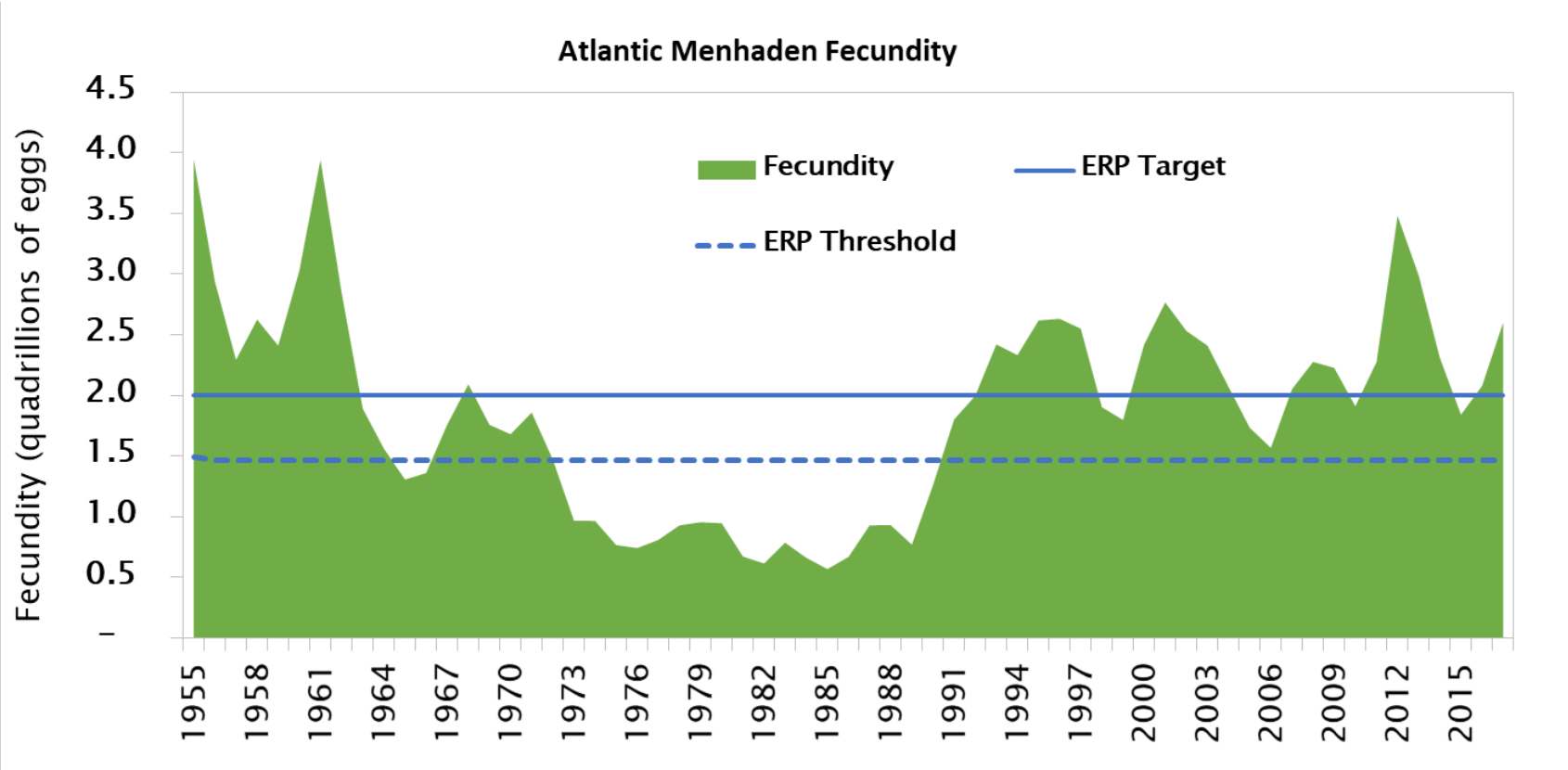


Figure 2. Atlantic menhaden fecundity, 1955-2017. The ERPs for population fecundity are FEC_{target} = 2,003,986 (billions of eggs), and $FEC_{threshold}$ = 1,492,854 (billions of eggs). FEC_{2017} = 2,601,550 billion eggs.

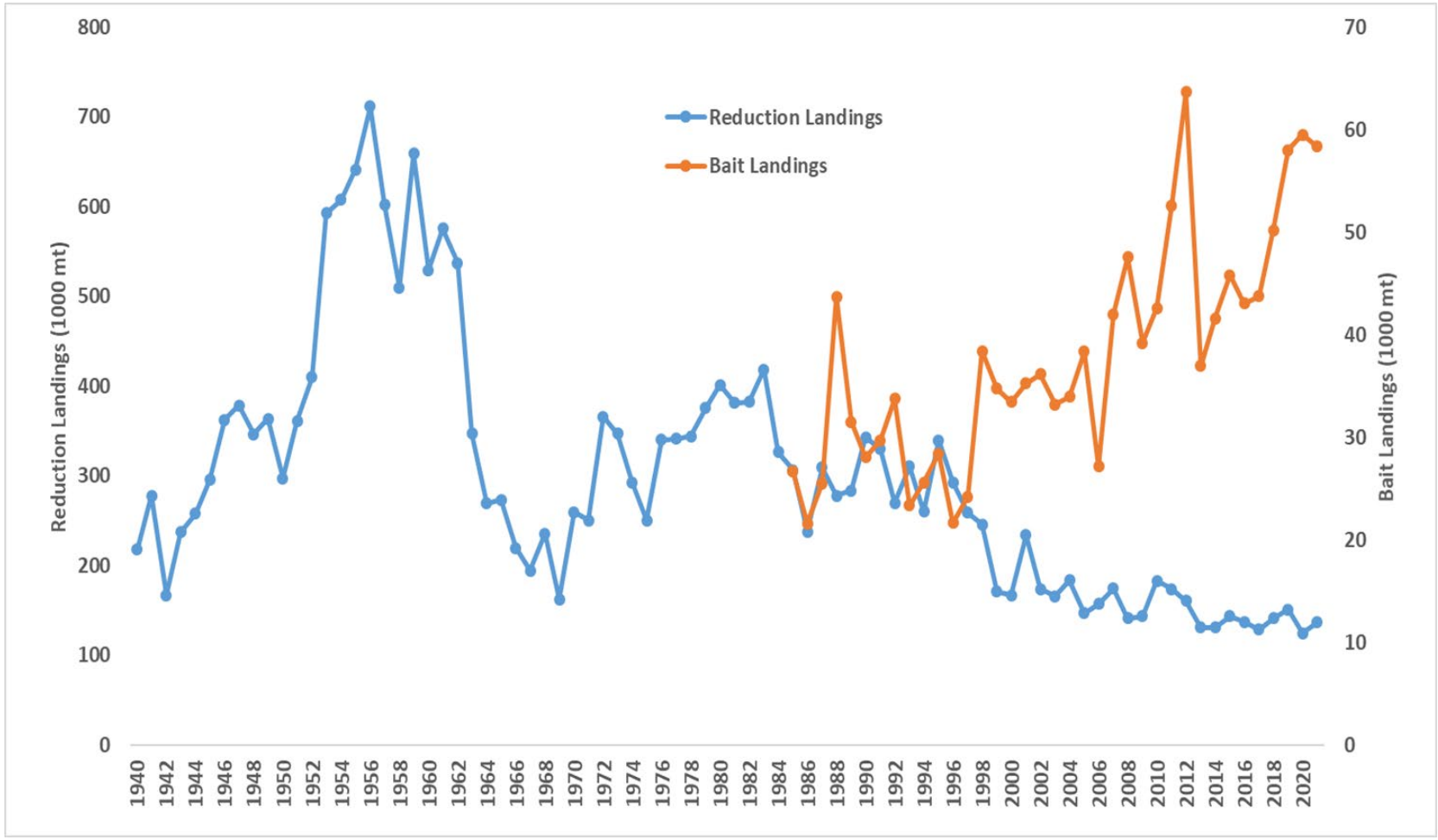


Figure 3. Landings from the reduction purse seine fishery (1940–2021) and bait fishery (1985–2021) for Atlantic menhaden. Note: there are two different scales on the y-axes.

Atlantic States Marine Fisheries Commission

DRAFT ADDENDUM I TO AMENDMENT 3 OF THE ATLANTIC MENHADEN INTERSTATE FISHERY MANAGEMENT PLAN FOR BOARD REVIEW

Commercial Allocations, Episodic Event Set Aside Program, and Incidental Catch/Small-Scale Fisheries

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

This draft document was developed for Board review and discussion at the August 2022 meeting week. This document is not intended to solicit public comment as part of the Commission/State formal public input process. However, comments on this draft document may be given at the appropriate time on the agenda during the scheduled meeting. Also, if approved, a public comment period will be established to solicit input on the issues contained in the document.

August 2022

Atlantic States Marine Fisheries Commission Seeks Your Input on Atlantic Menhaden Management

The public is encouraged to submit comments regarding this document during the public comment period. Comments will be accepted until 5:00 p.m. EST on **DAY, MONTH 2022**. Regardless of when they were sent, comments received after that time will not be included in the official record.

You may submit public comment in one or more of the following ways:

1. Attend public hearings pertinent to your state or jurisdiction; given COVID-19, it is likely most hearings will occur via webinar.
2. Refer comments to your state's members on the Atlantic Menhaden Board or Atlantic Menhaden Advisory Panel, if applicable.
3. Mail, fax, or email written comments to the following address:

James Boyle
Senior Fishery Management Plan Coordinator
Atlantic States Marine Fisheries Commission
1050 North Highland St., Suite 200 A-N
Arlington, VA 22201
Fax: (703) 842-0741
comments@asmfc.org (subject line: Atlantic Menhaden Draft Addendum I to Amendment 3)

If you have any questions please call James Boyle at 703.842.0740.

Commission's Process and Timeline

August 2021	Atlantic Menhaden Board Tasks Staff to Develop Draft Addendum I
August 2021 – July 2022	Staff Develops Draft Addendum I for Board Review
August 2022	**Atlantic Menhaden Board Reviews Draft Addendum I and Considers Its Approval for Public Comment**
August – October 2022	Board Solicits Public Comment and States Conduct Public Hearings
October 2022	Board Reviews Public Comment, Selects Management Options and Considers Final Approval of Addendum I
TBD	Provisions of Addendum I are Implemented

1. INTRODUCTION

The Atlantic States Marine Fisheries Commission (ASMFC) is responsible for managing Atlantic menhaden (*Brevoortia tyrannus*) in state waters (0–3 miles from shore) under the authority of the Atlantic Coastal Fisheries Cooperative Management Act, and has done so through an interstate fishery management plan (FMP) since 1981. The states of Maine through Florida have a declared interest in the fishery and are responsible for implementing management measures consistent with the interstate FMP. Management authority in the Exclusive Economic Zone (3-200 miles from shore) lies with NOAA Fisheries. For the purposes of this Addendum, the term "state" or "states" also includes the Potomac River Fisheries Commission.

At its August 2021 meeting, the ASMFC's Atlantic Menhaden Management Board (Board) approved the following motion:

Move to initiate an addendum to consider changes to commercial allocation, the episodic events set aside, and the small-scale/incidental catch provision. The purpose of this action is to address the issues outlined in the Atlantic Menhaden work group memo and the PDT should use the strategies provided in the work group memo as a starting point.

The Addendum proposes options to adjust states' commercial allocation to better align with availability; adjust the percentage of the episodic event set aside (EESA) program; and reduce incidental catch and small-scale fisheries (IC/SSF) landings from recent levels.

2. OVERVIEW

2.1 Statement of the Problem

Since the implementation of Amendment 3 (2017), dynamics in the commercial menhaden fishery have changed, most notably the rise of landings in the Gulf of Maine and an increase in quota transfers to the New England region; an increase in landings under the IC/SSF provision; and an annual reliance by some states on the EESA program. To sufficiently address the issues posed by these changes, the addendum addresses three separate but related components of the management program: 1) commercial allocation, 2) the IC/SSF provision, and 3) EESA program.

2.1.1 Commercial Allocations

The current allocations have resulted in the Total Allowable Catch (TAC) not being fully used coastwide, while some states do not have enough quota to maintain current fisheries. Quota transfers alone are not enough to ameliorate this issue. Some states have become reliant on the EESA and IC/SSF provision to maintain their fishery while other states regularly do not land their allocation.

2.1.2 Episodic Event Set Aside (EESA) Program

Over 90% of the EESA has been used in all years since 2016. With the increase in Atlantic menhaden availability to the Northeast, the program has become a secondary regional quota for several states to continue fishery operations in state waters. The dependency on the EESA highlights the mismatch of Atlantic menhaden distribution and availability to current commercial allocations.

2.1.3 Incidental Catch and Small-Scale Fisheries (IC/SSF)

The IC/SSF provision was intended to provide continued access for low-volume landings of menhaden once a state's directed fisheries quota was met and reduce regulatory discards. In recent years, menhaden availability at the northern part of its range has resulted in directed fishery quotas being met earlier in the year. Additionally, the coastwide landings under this category have exceeded a number of states directed fishery quotas and ranged from 1-4% of the annual TAC. Landings under this provision have only caused the overall TAC to be exceeded in a single year, 2021 (by 0.36%), but without changes, landings could remain at high levels or increase, potentially leading to more frequent exceedance of the TAC. Finally, the language in Amendment 3 has led to different interpretations of when landings fall under this provision (*i.e.* once a state's sector allocation is met or only once the full state allocation is met) and should be clarified.

2.2 Background

2.2.1 Allocation

Under Amendment 3, each state is allocated a 0.5% minimum quota and the remainder of the TAC is allocated based on a three-year average of landings from 2009-2011. On an annual basis, states have the option to relinquish part of or all of their fixed minimum quota by December 1st of the preceding fishing year. Any quota relinquished by a state is redistributed to other states that have not relinquished their quota, based on landings data from 2009-2011. Any overage of quota allocation is determined based on final allocations (inclusive of transfers), and the overage amount is subtracted from that state's quota allocation in the subsequent year on a pound-for-pound basis.

Amendment 2 (2012) also based state allocations on the three-year average of landings from 2009-2011; however, there was no fixed minimum. Table 1 shows a comparison of state quotas under Amendments 2 and 3, and highlights the influence of the 0.5% fixed minimum on states' allocations.

Table 1. A comparison of state allocations under menhaden Amendment 2 and Amendment 3. Both Amendments used a 2009-2011 allocation timeframe; Amendment 3 included a 0.5% fixed minimum. While under Amendment 2, Pennsylvania was not a part of the Board and did not have an allocation, therefore is noted with a "-".

State	Amendment 2 Allocation (%)	Amendment 3 Allocation (%)
Maine	0.04%	0.52%
New Hampshire	0%	0.50%
Massachusetts	0.84%	1.27%
Rhode Island	0.02%	0.52%
Connecticut	0.02%	0.52%
New York	0.06%	0.69%
New Jersey	11.19%	10.87%
Pennsylvania	-	0.50%
Delaware	0.01%	0.51%
Maryland	1.37%	1.89%
PRFC	0.62%	1.07%
Virginia	85.32%	78.66%
North Carolina	0.49%	0.96%
South Carolina	0%	0.50%
Georgia	0%	0.50%
Florida	0.02%	0.52%

From 2018 to 2020, total landings (directed, IC/SSF, and EESA) increased among the New England states of Maine, New Hampshire, and Massachusetts (Table 2). Maine and Massachusetts have both increased their percentage of coastwide total landings in recent years, with Maine's percentage increasing every year from 2016-2020 and Massachusetts from 2016-2021. A number of states have maintained directed fisheries while their landings have represented less than 0.2% of coastwide total landings (Connecticut, Delaware, and North Carolina). In 2021, Massachusetts, Rhode Island, Connecticut, Maryland, PRFC, and Virginia increased their percentage of coastwide total landings, relative to the previous year. Virginia's percentage of the coastwide landings decreased greatly in 2020 relative to 2019 because the state's largest fishery and processing plant was shut down for several weeks due to the COVID-19 pandemic.

Table 2. State total landings as a percentage of coastwide (CW) landings, 2016-2021. Total landings include directed bait, reduction, IC/SSF, and EESA landings. Amendment 3 allocations for directed bait and reduction landings were implemented beginning in 2018. To protect confidentiality, information for New Hampshire, Pennsylvania, South Carolina, and Georgia have been removed. **These are proportions of the coastwide landings; they do not represent allocations.**

State	% of 2016 CW Landings	% of 2017 CW Landings	% of 2018 CW Landings	% of 2019 CW Landings	% of 2020 CW Landings	% of 2021 CW Landings
Maine	1.50%	2.31%	3.48%	4.91%	6.33%	5.28%
New Hampshire				0.99%	1.02%	
Massachusetts	0.76%	0.96%	1.37%	1.51%	2.17%	2.30%
Rhode Island	0.00%	0.45%	0.17%	0.01%	0.05%	0.83%
Connecticut	0.02%	0.05%	0.20%	0.03%	0.03%	0.04%
New York	0.37%	0.40%	0.11%	0.21%	1.09%	0.83%
New Jersey	11.47%	12.15%	11.97%	10.96%	12.22%	10.59%
Pennsylvania						
Delaware	0.02%	0.02%	0.04%	0.02%	0.04%	0.01%
Maryland	1.40%	0.76%	0.74%	0.73%	0.64%	0.65%
PRFC	0.63%	0.55%	0.79%	0.51%	0.54%	0.59%
Virginia	83.66%	82.08%	80.85%	79.93%	75.66%	77.60%
North Carolina	0.10%	0.20%	0.17%	0.12%	0.15%	0.10%
South Carolina						
Georgia						
Florida	0.07%	0.07%	0.06%	0.05%	0.06%	0.03%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Since implementation of Amendment 3, the number of quota transfers has increased over time with 7, 17, 15, and 16 quota transfers occurring in 2018, 2019, 2020, and 2021, respectively. However, not every state transferred quota consistently; only Maine, Connecticut, Maryland, and Florida either gave or received quota every year from 2018-2021. Maine, New Hampshire, Massachusetts, and New Jersey had a net increase in quota through transfers in all four years. The net increase in quota by state over the four years ranged from 275,000 to 22.73 million pounds (Table 3). While the transfer of quota away from a state does not necessarily represent a decrease in abundance of menhaden, the transfer of quota to the New England states has coincided with increasing availability of menhaden regionally and the need for bait fish as the availability of Atlantic herring has decreased.

Table 3. Quota transfers in pounds by state for 2013-2021.

State	2013	2014	2015	2016	2017	2018	2019	2020	2021	2018-2021 Net Total	2018-2021 Average
ME				1,800,000	195,180	5,400,000	6,573,592	5,450,000	5,437,698	22,861,290	5,715,323
NH							3,373,592	2,300,000	2,600,000	8,273,592	2,757,864
MA	-500,000	-260,000	-508,685	-35,986			1,300,000	2,350,000	2,492,791	6,142,791	2,047,597
RI	15,000	50,000	33,685	35,986			-400,000	-1,800,000	1,240,675	-959,325	-319,775
CT						-500,000	-2,400,000	-2,000,000	-2,000,000	-6,900,000	-1,725,000
NY	1,000,000	210,000	475,000	492,823	300,000	-1,000,000	-1,900,000	500,000		-2,400,000	-800,000
NJ									275,000	275,000	275,000
PA								-500,000	-1,000,000	-1,500,000	-750,000
DE						-150,000		-100,000		-250,000	-125,000
MD						-1,500,000	-1,000,000	-1,350,000	-1,000,000	-4,850,000	-1,212,500
PRFC									-900,000	-900,000	-900,000
VA				-1,500,000		-1,000,000	-1,000,000			-2,000,000	-1,000,000
NC	-575,000			-877,823	-495,180		-600,000	-1,800,000	-2,000,000	-4,400,000	-1,466,667
SC							-2,347,184	-1,650,000	-1,775,000	-5,772,184	-1,924,061
GA									-1,971,164	-1,971,164	-1,971,164
FL	60,000			85,000		-1,250,000	-1,600,000	-1,400,000	-1,400,000	-5,650,000	-1,412,500

2.2.2 Episodic Event Set Aside Program (EESA)

The EESA Program was first implemented under Amendment 2 and clarified under Technical Addendum I later that year. Amendment 3 made no additional changes to the program. Annually, 1% of the TAC is set aside for episodic events, which are defined as any instance in which a qualified state has reached its quota allocation prior to September 1st and the state can prove the presence of unusually large amounts of menhaden in its state waters. To demonstrate a large amount of menhaden in state waters, a state can use surveys (e.g., aerial, seine) to indicate high biomass; landings information; or information highlighting the potential for fish kills, associated human health concerns, and that harvest would reduce or eliminate the fish kill. The goal of the program is to add flexibility in managing menhaden by allowing harvest during an episodic event, reduce discards, and prevent fish kills. States eligible to participate in the EESA program are limited to Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, and New York. When a state declares into the EESA, they are required to implement daily trip level harvester reporting and submit weekly reports to the ASMFC; restrict harvest and landings to state waters; and implement a maximum daily trip limit no greater than 120,000 pounds per vessel.

From 2013 through June 2022, the EESA has been used by Maine (6 years), Rhode Island (5 years), Massachusetts (2 years), and New York (2 years). Up to three states have participated at the same time. The starting date of states declaring into the program has ranged from mid-May to mid-August, with New York and Rhode Island opting in earlier than Maine and Massachusetts. Over 90% of the set-aside has been used in all years since 2016. In 2018 and 2019, Maine was the only state to declare into the EESA program and landed approximately 4.6 and 4.4 million pounds, respectively. In 2021, Maine, Massachusetts, and Rhode Island declared into the EESA program and combined the three states landed approximately 4.9 million pounds. Multiple states have implemented harvest control measures beyond the FMP's 120,000-pound trip limit, including: lower daily landings limits, weekly limits, limited landing days, and biomass thresholds for when the commercial fishery can operate.

The increasing reliance on the EESA program by some states has coincided with the decline in Atlantic herring and the increased availability of Atlantic menhaden in the Gulf of Maine. For more than a hundred years, there is evidence that periodic abundance of menhaden in the Gulf of Maine may last from 1 to 20 years then disappear for 1 to 20 years (Figure 1). In order to use the EESA and minimize disruptions to fishing activities, some states have sought creative ways at keeping their directed fishery open. In 2021, a number of states requested quota transfers as a group while fishing in the EESA, allowing for multiple quota transfers to be processed while the states continued to participate in the EESA program, in an effort to enable their directed fishery to resume after exiting the EESA with minimal interruption.

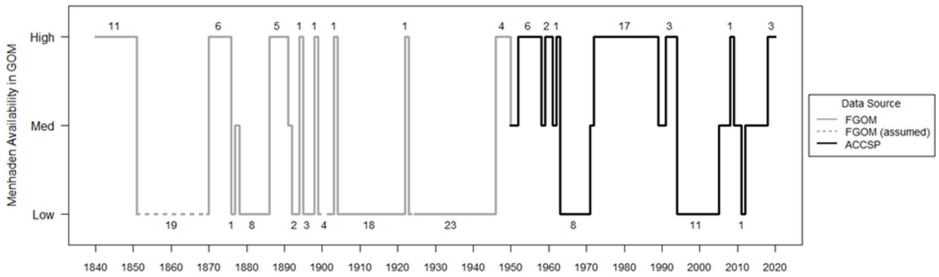


Figure 1. Reconstructed history of availability of Atlantic menhaden to the Gulf of Maine. The number of consecutive years in either a "High" or "Low" availability state are labeled. Data sources: *Fishes of the Gulf of Maine* (Bigelow and Schroeder 2002) and the Atlantic Coastal Cooperative Statistics Program (ACCSP).

2.2.3 Incidental Catch and Small-Scale Fisheries (IC/SSF)

A bycatch allowance was first implemented under Amendment 2, modified under Addendum I to Amendment 2 (2016), and modified again under Amendment 3. As outlined in Amendment 3, under the IC/SSF provision, after a state's allocation is met, small-scale directed and non-directed gear types may continue to land up to 6,000 pounds of menhaden per trip per day. The following gear types are identified in Amendment 3 as eligible to participate:

Small-scale gears: cast nets, traps (excluding floating fish traps), pots, haul seines, fyke nets, hook and line, bag nets, hoop nets, hand lines, trammel nets, bait nets, and purse seines which are smaller than 150 fathoms long and 8 fathoms deep.

Non-directed gears: pound nets, anchored/stake gillnets, drift gill net, trawls, fishing weirs, fyke nets, and floating fish traps.

Since Amendment 2, not all states transition from a directed fishery to an incidental catch or small-scale fishery under the same conditions. Both New Jersey and Virginia subdivide their quotas among sectors and have done so since state quotas were implemented in 2013. Virginia allocates its annual quota to three sectors: the reduction sector, the purse seine bait sector,

and the non-purse seine bait sector. New Jersey allocates the majority of its annual quota to the purse-seine fishery, and the remaining quota is allocated to all other gear types. Once the non-purse seine bait sector or "other gears" fishery has harvested its portion of the state's allocation, that fishery moves into an IC/SSF regardless of whether the entire state's quota has been harvested. This has resulted in Virginia and New Jersey reporting IC/SSF landings when they have not harvested their overall quota allocation for a given year. Since the inception of the IC/SSF provision, both states have reported landings following the closure of Virginia's non-purse seine bait fishery and New Jersey's "other gears" fishery as IC/SSF.

Prior to 2016, several states' IC/SSF landings are considered confidential, therefore only information from 2016-2021 is included in Table 4. From 2016-2021, 11 different states have had IC/SSF landings, with the most number of states (8) reporting IC/SSF in a year occurring in 2016 and the fewest (1) occurring in 2019. The annual coastwide total IC/SSF landings ranged from approximately 2.1 million pounds to 13.9 million pounds. The highest amount occurred in 2020, when Maine landed the majority at 13.6 million pounds, representing 53% of Maine's total landings that year. From 2016-2017 and 2018-2019, landings in this category increased by over 200%, with Maine being the only state with IC/SSF landings in 2019. From 2018-2020, the TAC remained constant at 216,000 mt while IC/SSF landings as a percentage of the annual TAC rose from less than 1% (2018) to nearly 3% (2020).

Table 4. IC/SSF landings in pounds from 2016-2021. Only states with these landings in this time period are included in the table. C = confidential (Some states are listed as confidential to protect the confidentiality of other states). Source: state compliance reports

State	2016	2017	2018	2019	2020	2021
Maine		5,373,940	2,995,145	10,750,929	13,605,497	11,771,235
Massachusetts					49,350	174,225
Rhode Island	39,540	135,748				C
Connecticut		126,986				C
New York	281,017	807,392			282,169	309,874
New Jersey	195,523		204,240		20,190	C
Delaware	20,823	29,285				
Maryland	995,698					
PRFC	105,669	670,447				
Virginia	325,692		110,281			
Florida	111,165	263,643				
Total	2,075,127	7,407,441	3,309,666	10,750,929	13,957,206	12,336,471
Percent Change		257%	-55%	225%	30%	-12%

Since 2013, a majority of landings under this provision occur on trips that land either 1,000 pounds or less (52%), or greater than 5,000 pounds but less than 6,000 pounds (20%). However, landings per trip has increased in recent years (in 2021, 21% of trips < 1,000 pounds; 50% of trips >5,000 pounds; Figure 2). From 2017 to 2021, the majority of these landings have been caught by purse seine (83%, average for the time series). The share of IC/SSF landings using purse seine gear has increased from 57% in 2017 to approximately 88% from 2019 to 2021 (Table 5).

Figure 2. Percent of incidental trips by size in pounds, 2013-2021. Source: state compliance reports

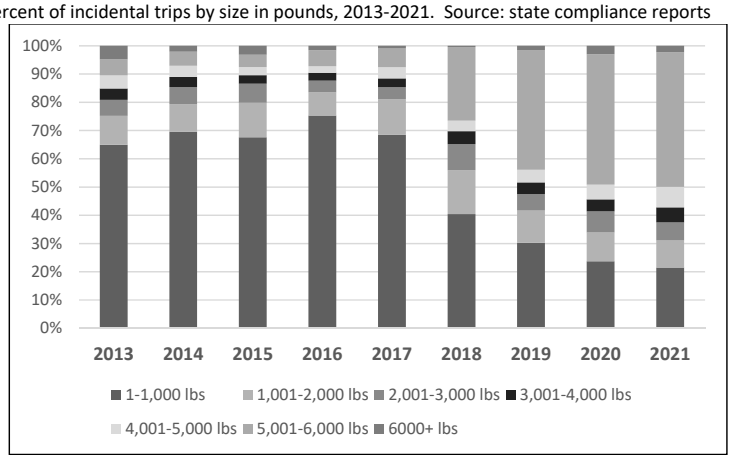


Table 5. Annual summary of total IC/SSF landings in pounds as a fraction of coastwide TAC; and the fraction of total IC/SSF landings coming from small-scale directed purse seine fishing. Source: state compliance reports

Year	Total landings	% of TAC	landings from purse seine	% from purse seine
2013	4,376,741	1.20%	0	0%
2014	6,831,462	1.90%	0	0%
2015	5,991,612	1.50%	0	0%
2016	2,075,127	0.50%	0	0%
2017	7,407,441	1.80%	4,291,347	58%
2018	3,290,066	0.70%	2,419,194	74%
2019	10,750,929	2.40%	9,545,747	89%
2020	13,957,206	3.10%	12,332,677	88%
2021	12,336,471	2.88%	10,850,372	88%

2.3.0 Social and Economic Impacts

Atlantic menhaden provide social and economic value to a diverse group of stakeholders both directly, to commercial and recreational menhaden fishing communities, and indirectly, to those who derive value from finfish, coastal birds, or marine mammals that predate upon menhaden. Menhaden-specific ERPs were developed and implemented to account for these diverse needs. The ERPs aim to provide sufficient menhaden to support sustainable menhaden fisheries, as well as menhaden's important role as a forage fish. Ensuring a stable forage base could increase the abundance of species that predate upon menhaden, such as other finfish, coastal birds, or marine mammals. An increase in abundance of these species could, in turn, lead to positive social and economic impacts for individuals, groups, or communities which rely on these resources for consumptive (e.g., commercial or recreational harvest) or non-consumptive purposes (e.g., bird or whale watching). Individuals who hold non-use values associated with affected species may also benefit from increased abundances (e.g., existence value from knowing a particular environmental resource exists or bequest value from preserving a natural resource or cultural heritage for future generations). Estimating potential economic or social impacts to these stakeholders as a result of menhaden-specific ERPs is challenging given complex and dynamic ecological relationships as well as the lack of socioeconomic data, especially for nonmarket goods and services.

This Addendum includes several measures which could carry social and economic impacts, notably potential changes to commercial allocations, the episodic event set aside program, and the incidental catch/small-scale fisheries provisions. The impacts of these changes on an individual stakeholder group will depend not only on the direction of these changes (e.g., whether the allocation is increasing or decreasing), but also a number of other social and economic factors. The extent and distribution of positive or negative socioeconomic effects arising from changes to allocations, or other provisions, is dependent on price elasticities (responsiveness of demand to a change in price), substitute products, fishing costs, alternative employment opportunities, fishing community structure, and possibly other factors.

Identifying quota allocation methods which are fair and equitable among fishery sectors, gear types, and regions will enhance socioeconomic net benefits if changes in allocation result in higher value or more efficient use of the menhaden resource. Efficiency improving shifts in allocation, while potentially beneficial overall, could disadvantage individual stakeholders through reductions in harvests, revenues, and profits.

A 2017 socioeconomic study of the commercial bait and reduction fisheries, funded by the ASMFC, contains several findings which elucidate possible social and economic impacts resulting from changes in menhaden management. While this study was conducted to inform Amendment 3, its findings may still be informative to the measures included in this Addendum. However, it is important to note that the study was focused on potential changes to the coastwide TAC, not the measures being considered in this Addendum. A study focused on, for

example, allocation changes might have different results based on the different spatial scales and tradeoffs considered.

In the 2017 study, researchers interviewed and surveyed industry members to uncover salient themes, analyzed historic landings data to resolve market relationships, performed economic impact analyses to consider the effects of various TAC changes, and conducted a public opinion survey to assess attitudes toward menhaden management (see Whitehead and Harrison, 2017 for the full report). Interviews and surveys of commercial fishers and other industry members found mixed opinions on several subjects; however, many agreed that the demand for menhaden bait, oil, and meal had increased in recent years. Exogenous demand increases, if leading to increases in ex-vessel prices, could benefit menhaden bait and reduction industry members.

Analysis of historic landings data revealed that prices for menhaden were negatively related to landings levels, but that this relationship was small and insignificant in some instances. In particular, state-level analysis showed ex-vessel price was insensitive to landings. This finding suggested that reductions in the TAC might reduce commercial fishery revenues as decreases in landings are not fully compensated by higher prices. The effects of a change in the allocation of TAC among states is not clear. However, it was found that ex-vessel prices of menhaden were not uniform along the coast, with some states having higher prices than others, suggesting a change in allocation could influence fleet revenues.

Economic impact analyses of changes to the TAC found income and employment decreases (increases) corresponding to TAC decreases (increases), with the largest impacts concentrated in New Jersey and Virginia. For example, the analysis suggests that when totaling direct, indirect, and induced economic changes in the bait fishery, a 5% increase in the TAC from the 2017 baseline would result in 18 more jobs, a $476,000 increase in total earnings, and a $1.7 million increase in total economic output. Looking at the reduction sector, a 5% increase in the TAC from the 2017 baseline is estimated to increase total economic output (includes direct, indirect, and induced economic effects) by $3.6 million in Northumberland county and add 77 full and part-time jobs The difference in economic impacts between the bait and reduction sector is largely due to the difference in scale between the sectors, i.e., a 5% increase to reduction landings would be much higher in metric tons than a 5% increase to bait landings. In addition, it is important to note that economic impact analyses such as the one conducted in this study are a coarse assessment of potential economic impact, and they often do not take into account specific fishery and market dynamics.

Interestingly, subsequent analysis of coastal county income and employment changes in response to changes in bait landings (not reduction landings) showed little effect, casting some doubt on the conclusion that adjustments in menhaden TAC consistently lead to changes in fishery income and employment in the bait fishery. It may also be that the magnitude of impact is dependent on the size of the fishery in each state and the ability of fishermen to harvest other species. Nonetheless, it is reasonable to expect that if the TAC were to remain fixed but be allocated to states differently, those states receiving increased allocation would have

positive economic impacts if the increase in allocation would lead to an increase in harvest. For those that received decreased quota, the expected impacts would depend on the expected impacts on harvest: if the reduced allocation would reduce harvest, negative economic impacts would be expected; however, if the reduced allocation was less than or equal to the state's latent quota, i.e., would not have any expected impacts on harvest, no economic impacts would be expected.

3. PROPOSED MANAGEMENT PROGRAM

This addendum considers modifying the following components of the management program: 1) commercial allocations, 2) IC/SSF provision, and the 3) EESA program. An objective is listed for each component to guide evaluation of proposed options for addressing the issues identified in the statement of the problem.

In response to concerns that 2020 landings were atypical due to impacts from the COVID-19 pandemic, the full extent of which are unknown and possibly variable between states, the Board elected to exclude 2020 landings data in the commercial allocation options of this draft addendum, thereby minimizing the effects of COVID-19 on allocation.

The Plan Development Team (PDT) has highlighted the management options that they recommend the Board remove in order to focus on key solutions and reduce the complexity of the document. Taking these steps will ensure the public will be able to understand and comment on proposed changes to the management program more effectively. Recommendations can be found in an accompanying memo (M22-78). As the document is drafted there are 35 total options in the Draft Addendum (16 combinations of allocation options; 3 options for the EESA program; and 16 options for the IC/SSF provision).

3.1 Commercial Allocation

Objective: Allocations should be adjusted to 1) align with the availability of the resource 2) enable states to maintain current directed fisheries with minimal interruptions during the season; 3) reduce the need for quota transfers and; 4) fully use the annual TAC without overage.

To account for the various combinations of allocation methods and timeframes the following management options have been divided into two steps. The first step outlines the method for setting the minimum allocation, and the second step outlines the approach used to allocate the remaining TAC. An option must be chosen in each step to complete an allocation package. Options under each of the following steps were developed using total landings information including quota transfers, and landings under the IC/SSF provision and EESA program.

Step 1:

3.1.1 Allocation options for addressing the minimum allocation.

The current fixed minimum allocation of 0.5% has been consistently underutilized by several states, with some states transferring or relinquishing some or all of their quota, and others keeping their unused quota. The Amendment 3 provisions of EESA, IC/SSF, and quota transfers have been utilized every year since the Amendment was implemented, indicating the latent quota created by the fixed minimum could be adjusted to reduce reliance on these provisions. Some states have highly variable landings, which will likely lead to them rarely exceeding their allocation under some allocation option below. It is important to keep in mind nearly all states have the potential to reach their quota prior to the end of the year under any allocation strategy under the current TAC. Any latent quota reduction produced by selecting the tiered option below will automatically be reallocated to the states based on the allocation method selected in step 2 (section 3.1.2).

Option A. Status Quo: Each state is allocated a 0.5% fixed minimum quota. Total TAC assigned under this option is 8.0% (i.e. 16 states x 0.50%= 8%).

Option B. Three-tiered fixed minimum approach: This option would assign states into three tiers (0.01%, 0.25%, or 0.50%) based on total landings. The states of Pennsylvania, South Carolina, and Georgia would be included in tier one and receive 0.01%. Tier two includes Connecticut, Delaware, North Carolina, and Florida, with each state receiving 0.25%. The remaining states would be in tier three and receive 0.5% of the TAC. The three states in tier one have consistent small-scale, bycatch fisheries, or have harvested no Atlantic menhaden from 2009-2020. The 0.01% coupled with the timeframe allocation assigned in Step 2 below would have covered their limited landings from 2009-2020 under all combinations. Depending on the selection made in Step 2 below, the tier two states would have had sufficient quota to cover their landings every year from 2009-2020, except North Carolina, which could have had up to two years that would have not been covered depending on the timeframe selected, but in nearly all other years they would have used less than half of their allocation. Total TAC assigned under this option is 5.53% (i.e., 3 states x 0.01% + 4 states * 0.25% + 9 states * 0.50% = 5.53%).

Step 2:

3.1.2 Timeframes to base allocating the remaining TAC.

Option 1. Status Quo: Three-year average of landings from 2009-2011. This option only incorporates landings from a short unregulated time period and does not reflect current Atlantic menhaden distribution or fishery performance.

Option 2. 2018, 2019 & 2021
The quota allocation timeframe is based on the most recent average landings from 2018, 2019, and 2021. This timeframe reflects the most recent landings history and is more likely to align with current stock distribution, but does not reflect previous stock distribution or fishery performance.

Option 3. Weighted Time Frames
These options consider both recent and historical timeframes with sub-options of different weighting values. These options are similar to a long term average but focus on a shorter overall timeframe, and can emphasize either more recent or historical fishery performance.

- 3A. Weighted Allocation Timeframe #1 (2009-2011 and 2018, 2019 & 2021) includes the three most recent years, excluding 2020, and the first three years of quality bait fishery data during the unregulated time period.
  - Sub-Option 1. 25% 2009-2011 / 75% 2018, 2019 & 2021 – This weighting strategy emphasizes the more recent timeframe.
  - Sub-Option 2. 50% 2009-2011 / 50% 2018, 2019 & 2021 – This strategy weights both timeframes evenly.
- 3B. Weighted Allocation Timeframe #2* (2009-2012 and 2017-2019 & 2021) includes the four most recent years, excluding 2020, and the first four years of quality bait fishery data during the unregulated time period.
  - Sub-Option 1. 25% 2009-2012 / 75% 2017-2021– This weighting strategy emphasizes the more recent timeframe.
  - Sub-Option 2. 50% 2009-2012 / 50% 2017-2021 – This strategy weights both timeframes evenly.

Commented [TK1]: The PDT recommends removal because this option achieves the same objective as timeframe 1 of option 3A.

Option 4. Moving Average
This option uses a three-year moving average to annually adjust allocations as the stock and fishery dynamics change. The three-year average is lagged to allow for finalizing data and time to inform states of their quota (i.e. 2018, 2019 & 2021 average used to set 2023 allocation). This option continually adjusts allocations to recent stock distribution and fishery performance, potentially reducing the need for reallocating in the future. Landings used to calculate the three-year moving average differ under each of the options and may include a state's base quota, any quota transferred to a state, catch under the EESA, and catch under the incidental catch set aside. Any state with harvest overage within the three-year time frame that is not covered by the provisions of the FMP will not have the overage portion of their landings count in calculating the moving average, and will still be required to pay any overage back pound for pound the year following the overage occurrence.

4A. No alterations to the Option. There will be no alterations to the option as described above and total landings will be used in the calculations under this option.

4B. Provision to limit states' moving average landings if total landings exceed the TAC.

State landings less than or equal to the coastwide TAC would be used in the calculation of the moving average, regardless of the source. If total landings (directed plus IC/SSF plus EESA) are below the TAC, then all landings would be included. If directed landings are below the TAC but IC/SSF and/or EESA landings bring total landings over the TAC, then only the portion of IC/SSF and EESA landings that achieve the TAC would count toward the moving average calculation.

Calculation Procedure: (This procedure is only for moving average calculation when the IC/SSF landings added to directed landings exceed the TAC) EESA participation requires opting in and out of the program by providing dated notice to ASMFC and weekly landings reporting at a minimum. Any overage of the EESA that is not reconciled through a transfer will be subtracted from a states total landings prior to calculation. If more than one state is participating at the time of the overage the percentage of each state landings in the week (or weeks) the overage occurred will be used to produce the state by state landings reduction required by the EESA overage. A week is defined as Sunday through Saturday.

The following will be calculated to determine the IC/SSF landings that are over the TAC to be removed from state landings prior to moving average calculation. The Landings termed Excess IC/SSF landings in the calculations below do not include IC/SSF landings for a state that total landings, combined directed and IC/SSF landings, would not have exceeded a state's quota (i.e. a state closes its directed fishery early and operates under the IC/SSF restrictions, but never exceeds its quota). EESA landings included below will be after any adjustment made above (allowable EESA only).

IC/SSF Landings over the TAC = ((Total Landings) – TAC)) – (Overages that are not associated with the IC/SSF).

States Adjusted final Quota (AFQ) = (((State's Base Quota) + or – (Transfers)) + (EESA landings))) – (Overages that are not associated with the IC/SSF).

State Excess IC/SSF Landings = (State's Total Landings) > State's AFQ.

Total Excess IC/SSF Landings = The Sum of all states Excess IC/SSF Landings.

State's % of Excess IC/SSF= (State Excess IC/SSF Landings) / (Total Excess IC/SSF Landings).

Reduction of a states IC/SSF Landings = (IC/SSF landings over the TAC) * (State's % of Excess IC/SSF).

State landings to be used in Moving average Calculation = ((States total Landings) – (Reduction of IC/SSF landings))-Overages

Table 6. A1-3. Percent annual allocation by state using the 0.5% fixed minimum (Step 1, Option A) allocation and the 2009-2011; 2018, 2019 & 2021; and weighted timeframe allocations (Step 2, Options 1-3). Each of the two weighted timeframe combinations of 2009-2011/2018, 2019 & 2021 (Step 2, Option 3A), and 2009-2012/2017-2019 & 2021 (Step 2, Option 3B) are weighted 25% earlier /75% recent (Sub-Option 1) and 50% recent /50% earlier (Sub-Option 2).

State	Time Frame		2009-2011/2018,2019 & 2021		2009-2012/2017-2019 & 2021	
	A1 Status Quo 2009-2011	A2 2018, 2019 and 2021	A3: A-1 25%/75%	A3: A-2 50%/50%	A3: B-1 25%/75%	A3: B-2 50%/50%
ME	0.52%	4.71%	3.66%	2.61%	3.30%	2.37%
NH	0.50%	1.19%	1.01%	0.84%	0.90%	0.77%
MA	1.27%	2.09%	1.88%	1.68%	1.73%	1.54%
RI	0.52%	0.81%	0.73%	0.66%	0.75%	0.67%
CT	0.52%	0.58%	0.56%	0.55%	0.56%	0.54%
NY	0.69%	0.85%	0.81%	0.77%	0.81%	0.77%
NJ	10.87%	10.77%	10.81%	10.85%	11.32%	11.66%
PA	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%
DE	0.51%	0.52%	0.52%	0.52%	0.52%	0.52%
MD	1.89%	1.15%	1.34%	1.53%	1.42%	1.68%
PRFC	1.07%	1.07%	1.07%	1.07%	1.10%	1.13%
VA	78.66%	73.60%	74.85%	76.10%	74.85%	75.56%
NC	0.96%	0.62%	0.70%	0.79%	0.69%	0.75%
SC	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%
GA	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%
FL	0.52%	0.54%	0.54%	0.53%	0.54%	0.53%

Table 7. A4A. Percent annual allocation by state using the 0.5% fixed minimum allocation (Step 1, Option A) and the three year moving average allocation (Step 2, Option 4A) as it would have changed through time, and the year the timeframe would have been used to set allocations.

State	2009-2011	2010-2012	2011-2013	2012-2014	2013-2015	2014-2016	2015-2017	2016-2018	2017-2019	2018, 2019 & 2021
ME	0.52%	0.51%	0.51%	0.51%	0.51%	0.97%	1.64%	2.76%	3.85%	4.71%
NH	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.52%	0.85%	1.19%
MA	1.27%	0.91%	0.77%	0.95%	1.09%	1.13%	1.24%	1.46%	1.69%	2.09%
RI	0.52%	0.52%	0.52%	0.55%	0.71%	0.72%	0.82%	0.71%	0.69%	0.81%
CT	0.52%	0.51%	0.51%	0.51%	0.51%	0.51%	0.53%	0.59%	0.59%	0.58%
NY	0.69%	0.67%	0.68%	0.70%	0.77%	0.79%	0.85%	0.77%	0.72%	0.85%
NJ	10.93%	13.45%	13.94%	12.81%	10.67%	10.89%	11.25%	11.41%	11.23%	10.77%
PA	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%
DE	0.51%	0.52%	0.52%	0.53%	0.53%	0.53%	0.52%	0.52%	0.52%	0.52%
MD	1.90%	2.18%	2.33%	2.52%	2.16%	2.02%	1.71%	1.38%	1.18%	1.15%
PRFC	1.07%	1.20%	1.30%	1.41%	1.23%	1.15%	1.06%	1.11%	1.06%	1.07%
VA	78.60%	76.18%	75.57%	76.30%	78.57%	78.04%	77.15%	76.08%	74.92%	73.60%
NC	0.96%	0.83%	0.80%	0.64%	0.68%	0.67%	0.66%	0.64%	0.65%	0.62%
SC	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%
GA	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%
FL	0.52%	0.52%	0.54%	0.55%	0.57%	0.57%	0.57%	0.56%	0.55%	0.54%
Year in Use	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021/2022**	**2023**

Table 8. A4B. Percent annual allocation by state using the 0.5% fixed minimum allocation (Step 1, Option A) and the three year moving average allocation (Step 2, Option 4B), as it would have changed through time, and the year the timeframe would have been used to set allocations. Note: 2021 values only include landings under the TAC according to the calculation outlined in Option 4B.

State	2009-2011	2010-2012	2011-2013	2012-2014	2013-2015	2014-2016	2015-2017	2016-2018	2017-2019	2018, 2019 & 2021
ME	0.52%	0.51%	0.51%	0.51%	0.51%	0.97%	1.64%	2.76%	3.85%	4.57%
NH	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.52%	0.85%	1.17%
MA	1.27%	0.91%	0.77%	0.95%	1.09%	1.13%	1.24%	1.46%	1.69%	2.09%
RI	0.52%	0.52%	0.52%	0.55%	0.71%	0.72%	0.82%	0.71%	0.69%	0.81%
CT	0.52%	0.51%	0.51%	0.51%	0.51%	0.51%	0.53%	0.59%	0.59%	0.58%
NY	0.69%	0.67%	0.68%	0.70%	0.77%	0.79%	0.85%	0.77%	0.72%	0.83%
NJ	10.93%	13.45%	13.94%	12.81%	10.67%	10.89%	11.25%	11.41%	11.23%	10.79%
PA	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%
DE	0.51%	0.52%	0.52%	0.53%	0.53%	0.53%	0.52%	0.52%	0.52%	0.52%
MD	1.90%	2.18%	2.33%	2.52%	2.16%	2.02%	1.71%	1.38%	1.18%	1.15%
PRFC	1.07%	1.20%	1.30%	1.41%	1.23%	1.15%	1.06%	1.11%	1.06%	1.08%
VA	78.60%	76.18%	75.57%	76.30%	78.57%	78.04%	77.15%	76.08%	74.92%	73.76%
NC	0.96%	0.83%	0.80%	0.64%	0.68%	0.67%	0.66%	0.64%	0.65%	0.62%
SC	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%
GA	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%
FL	0.52%	0.52%	0.54%	0.55%	0.57%	0.57%	0.57%	0.56%	0.55%	0.54%
Year in Use	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021/2022**	**2023**

Table 9. B1-3. Percent annual allocation by state using the three tier minimum (Step 1, Option B) allocation the 2009-2011; 2018, 2019 & 2021 and weighted timeframe allocations (Step 2, Options 1-3). Each of the two weighted timeframe combinations of 2009-2011/2018, 2019 & 2021 (Step 2, Option 3A), and 2009-2012/2017-2019 & 2021 (Step 2, Option 3B) are weighted 25% earlier /75% recent (Sub-Option 1) and 50% recent /50% earlier (Sub-Option 2).

State	Time Frame		2009-2011/2018,2019 & 2021		2009-2012/2017-2019 & 2021	
	B1 2009-2011	B2 2018, 2019 and 2021	B3: A-1 25%/75%	B3: A-2 50%/50%	B3: B-1 25%/75%	B3: B-2 50%/50%
ME	0.52%	4.82%	3.74%	2.67%	3.38%	2.42%
NH	0.50%	1.20%	1.03%	0.85%	0.91%	0.77%
MA	1.29%	2.13%	1.92%	1.71%	1.77%	1.57%
RI	0.52%	0.81%	0.74%	0.67%	0.76%	0.68%
CT	0.27%	0.33%	0.32%	0.30%	0.31%	0.29%
NY	0.70%	0.86%	0.82%	0.78%	0.82%	0.77%
NJ	11.21%	11.05%	11.09%	11.13%	11.61%	11.96%
PA	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
DE	0.26%	0.27%	0.27%	0.27%	0.27%	0.27%
MD	1.94%	1.17%	1.36%	1.55%	1.45%	1.71%
PRFC	1.09%	1.09%	1.09%	1.09%	1.11%	1.15%
VA	80.70%	75.57%	76.85%	78.13%	76.85%	77.58%
NC	0.72%	0.37%	0.46%	0.54%	0.45%	0.50%
SC	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
GA	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
FL	0.27%	0.29%	0.29%	0.28%	0.29%	0.28%

Table 10. B4A. Percent annual allocation by State using the three tier minimum allocation (Step 1, Option B) and the three year moving average allocation (Step 2, Option 4A), as it would have changed through time, and the year the timeframe would have been used to set allocations.

State	2009-2011	2010-2012	2011-2013	2012-2014	2013-2015	2014-2016	2015-2017	2016-2018	2017-2019	2018, 2019 & 2021
ME	0.52%	0.51%	0.51%	0.51%	0.51%	0.98%	1.67%	2.82%	3.94%	4.82%
NH	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.52%	0.86%	1.20%
MA	1.29%	0.92%	0.78%	0.97%	1.10%	1.15%	1.26%	1.48%	1.73%	2.13%
RI	0.52%	0.52%	0.52%	0.55%	0.72%	0.73%	0.82%	0.72%	0.69%	0.81%
CT	0.27%	0.26%	0.26%	0.26%	0.26%	0.26%	0.28%	0.34%	0.34%	0.33%
NY	0.70%	0.67%	0.69%	0.71%	0.78%	0.80%	0.85%	0.77%	0.72%	0.86%
NJ	11.21%	13.80%	14.30%	13.14%	10.94%	11.17%	11.54%	11.71%	11.52%	11.05%
PA	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
DE	0.26%	0.27%	0.27%	0.28%	0.29%	0.28%	0.27%	0.28%	0.27%	0.27%
MD	1.94%	2.23%	2.38%	2.58%	2.20%	2.06%	1.74%	1.41%	1.20%	1.17%
PRFC	1.09%	1.22%	1.33%	1.44%	1.25%	1.17%	1.08%	1.12%	1.08%	1.09%
VA	80.70%	78.22%	77.59%	78.34%	80.67%	80.12%	79.21%	78.11%	76.91%	75.57%
NC	0.72%	0.59%	0.56%	0.40%	0.43%	0.42%	0.41%	0.40%	0.40%	0.37%
SC	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
GA	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
FL	0.27%	0.27%	0.29%	0.30%	0.32%	0.32%	0.32%	0.31%	0.31%	0.29%
Year in Use	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021/2022**	**2023**

Table 11. B4B. Percent annual allocation by State using the three tier minimum allocation (Step 1, Option B) and the three year moving average allocation (Step 2, Option 4B), as it would have changed through time, and the year the timeframe would have been used to set allocations. Note: 2021 values only include landings under the TAC according to the calculation outlined in Option 4B.

State	2009-2011	2010-2012	2011-2013	2012-2014	2013-2015	2014-2016	2015-2017	2016-2018	2017-2019	2018, 2019 & 2021
ME	0.52%	0.51%	0.51%	0.51%	0.51%	0.98%	1.67%	2.82%	3.94%	4.68%
NH	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.52%	0.86%	1.18%
MA	1.29%	0.92%	0.78%	0.97%	1.10%	1.15%	1.26%	1.48%	1.73%	2.13%
RI	0.52%	0.52%	0.52%	0.55%	0.72%	0.73%	0.82%	0.72%	0.69%	0.82%
CT	0.27%	0.26%	0.26%	0.26%	0.26%	0.26%	0.28%	0.34%	0.34%	0.33%
NY	0.70%	0.67%	0.69%	0.71%	0.78%	0.80%	0.85%	0.77%	0.72%	0.83%
NJ	11.21%	13.80%	14.30%	13.14%	10.94%	11.17%	11.54%	11.71%	11.52%	11.07%
PA	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
DE	0.26%	0.27%	0.27%	0.28%	0.29%	0.28%	0.27%	0.28%	0.27%	0.27%
MD	1.94%	2.23%	2.38%	2.58%	2.20%	2.06%	1.74%	1.41%	1.20%	1.17%
PRFC	1.09%	1.22%	1.33%	1.44%	1.25%	1.17%	1.08%	1.12%	1.08%	1.09%
VA	80.70%	78.22%	77.59%	78.34%	80.67%	80.12%	79.21%	78.11%	76.91%	75.73%
NC	0.72%	0.59%	0.56%	0.40%	0.43%	0.42%	0.41%	0.40%	0.40%	0.37%
SC	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
GA	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
FL	0.27%	0.27%	0.29%	0.30%	0.32%	0.32%	0.32%	0.31%	0.31%	0.29%
Year in Use	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021/2022**	**2023**

3.2 EESA Program

Objective: Ensure sufficient access to episodic changes in regional availability in order to minimize in-season disruptions and reduce the need for quota transfers and IC/SSF landings.

3.2.1 Increase the Set-Aside

Goal: In combination with reallocation or separately, ensure the states of Maine to New York have increased bait quota for this program to reduce the need for in-season quota transfers or reliance on the IC/SSF provision in response to the increased presence of Atlantic menhaden biomass in the Northeast.

For both Options 1 and 2, the mandatory provisions, declaring participation, procedure for unused set aside, and procedure for set aside overages (Sections 4.3.6.1- 4.3.6.4) as outlined in Amendment 3 (Section 4.3.6.3) will remain in effect.

For Option 2 only, there are two sub-options for the Board's consideration. To allow for additional flexibility in managing the EESA depending on states' allocations and the need to reduce quota transfers, the following sub-options allow for the EESA to be set during the TAC setting process, rather than through adaptive management as outlined in Amendment 3.

Option 1. Status Quo (1%) – The EESA would remain at 1% of the total coastwide TAC. Should any quota remain unused after October 31st, annually, it would revert back into the common pool.

Option 2. Increase up to 5% - This option would allow the Board to increase the EESA to a specific percentage greater than or equal to 1% and less than or equal to 5%. The designated percentage of EESA would be subtracted from the total coastwide TAC prior to the distribution of allocation to states. Depending upon the option(s) chosen under Section 3.1, re-adjusting the fixed minimum quota could offset the possible increase in the EESA (see note below).

Sub-option 1. EESA is set as a static amount of 1-5%: The Board may choose an EESA between 1 and 5% and the chosen option is static until a subsequent Amendment or Addendum.

Sub-option 2. Set the EESA during Specifications at an amount between 1-5%: Under this option the Board will set the EESA at an amount between 1 to 5% during the Specification process as part of approving the TAC. The TAC and EESA may be set annually or on a multi-year basis depending on Board action.

Note (only applies if a tiered minimum approach is selected): The 0.5% fixed minimum from Amendment 3 allocated 8.0% of the TAC prior to timeframe based allocation of state quotas. If the fixed minimum was replaced by the three-tiered minimum allocation strategy, the 8.0% would be reduced to 5.53%. The amount of quota left by selecting the tiered option (2.47%),

will be reallocated to the states, but increasing the EESA to 2.47% or less will result in a similar value in pounds being removed from the TAC prior to time frame based allocation. In Amendment 3, nine percent of the TAC either went to the EESA or the fixed minimum allocation.

3.3 IC/SSF Provision

Objective: Sufficiently constrain landings to achieve overall management goals of: 1) meeting the needs of existing fisheries, 2) reducing discards, and 3) indicating when landings can occur and if those landings are a part of the directed fishery.

In this section, there are four sub-topics to address IC/SSF landings. They include proposed changes to the timing of when states can begin landing under this provision (3.3.1); permitted gear types (3.3.2); changes to the IC/SSF trip limit (3.3.3); and considering a new accountability system for IC/SSF landings (3.3.4).

3.3.1 Timing of IC/SSF Provision

Goal: Address the timing of when a state begins fishing under the provision since it impacts the duration that landings occur.

> Option 1. No change (Status quo): Once a quota allocation is reached for a given state, the fishery moves to an incidental catch fishery. Currently, individual states interpret "*after a quota allocation is met for a given state*" differently (i.e., whether this refers to the entire allocation or a sector, fishery, or gear allocation).
>
> Option 2. Sector/fishery/gear type allocation within a state is met: Currently, states such as New Jersey and Virginia further divide their state allocation into sector and gear type specific allocations. The provision would confirm that once a sector/fishery/gear type specific allocation is reached for a state, that state's sector/fishery/gear type fishery can begin landing catch under the provision.
>
> Option 3. Entire states allocation met: Once the entire quota allocation for a given state is reached, regardless of sector/fishery/gear type fishery allocations, the menhaden fishery moves to landing under the IC/SSF provision.

3.3.2 Permitted Gear Types of the of IC/SSF Provision

Goal: Address the volume of landings under the provision by removing specific gear types

> **Note:** Under Amendment 3, fyke nets were listed under both gear types which may lead to two different possession limits for the same gear type under 3.3.3 below, should the possession limit for directed gear types be modified. Therefore, under Options 2 and 3, fyke nets have been removed from the small-scale directed gear type category and

maintained only in the non-directed gear type category. Additionally, trammel nets are defined as a directed gear under Amendment 3, but at the request of the Board was moved into the non-directed gear type category for Options 2 and 3 below. Option 1 Sub-Options 2 and 3 provide a mechanism for the classifications to be changed without changing permitted gear types.

Option 1. No changes to permitted gear types (Status quo): The provision would apply to both small-scale directed gears and non-directed gears. Small scale directed gears shall include cast nets, traps (excluding floating fish traps), pots, haul seines, fyke nets, hook and line, bag nets, hoop nets, hand lines,trammel nets bait nets, and purse seines which are smaller than 150 fathoms long and eight fathoms deep. Non-directed gears include pound nets, anchored/stake gillnets, drift gill net, trawls, fishing weirs, fyke nets, and floating fish traps.

> Sub-Option 1 (Status quo). All gear types will retain the classifications as defined in Amendment 3.
>
> Sub-Option 2. Fyke nets will be removed from the small-scale directed gear type category, thereby becoming listed only as a non-directed gear.
>
> Sub-Option 3. Fyke nets will be removed from the small-scale directed gear type category, thereby becoming listed only as a non-directed gear, and trammel nets will be reclassified as a non-directed gear type.

Option 2. No purse seines, all other small-scale and non-directed gears maintained: The provision would apply to both small-scale directed gears and non-directed gears, but exclude purse seine gears. This option is included due to the growth of directed landings from small-scale purse seine gears in recent years (Table 6). Landings from purse seine gears would count against a state's directed fishery quota. Small-scale directed gears shall include cast nets, traps (excluding floating fish traps), pots, haul seines, hook and line, bag nets, hoop nets, hand lines, and bait nets. Non-directed gears include pound nets, anchored/stake gillnets, trammel nets, drift gill net, trawls, fishing weirs, fyke nets, and floating fish traps.

Option 3. Non-directed gears only: The provision shall apply to non-directed gears only. This includes pound nets, anchored/stake gillnets, trammel nets, drift gill net, trawls, fishing weirs, fyke nets, and floating fish traps.

3.3.3 Trip Limit for Directed Small-Scale Fisheries of IC/SSF Provision

Goal: Limit the annual volume of IC/SSF landings by reducing the trip limit.

The options below modify the trip limits for directed small-scale fisheries. Stationary multi-species gears are defined as pound nets, anchored/stake gill nets, fishing weirs, floating fish

traps, and fyke nets. A trip is based on a calendar day such that no vessel may land menhaden more than once in a single calendar day. The use of multiple carrier vessels per trip to offload any bycatch exceeding the daily trip limit of Atlantic menhaden is prohibited. If Option 3 was selected in section 3.3.2 above, this section is no longer needed.

> Option 1. No change to trip limit (Status quo): small-scale gears and non-directed gear types may land up to 6,000 pounds of menhaden per trip per day. Two authorized individuals, working from the same vessel fishing stationary multi-species gear, are permitted to work together and land up to 12,000 pounds from a single vessel – limited to one vessel trip per day.

For both Options 2 and 3 below, the proposed change in the trip limit would only apply to small-scale directed gears which include cast nets, traps (excluding floating fish traps), pots, haul seines, hook and line, bag nets, hoop nets, hand lines, bait nets, and purse seines which are smaller than 150 fathoms long and 8 fathoms deep. Non-directed gears and stationary multi-species gears would still be able to land up to 6,000 pounds of menhaden per trip per day, with two individuals working from the same vessel fishing stationary multi-species gear, permitted to work together can land up to 12,000 pounds.

> Option 2. 4,500 pound trip limit for directed gear types: The trip limit for the directed small-scale fishery shall be 4,500 pounds of menhaden per trip per day.

> Option 3. 3,000 pound trip limit for directed gear types: The trip limit for the directed small-scale fishery shall be 3,000 pounds of menhaden per trip per day.

3.3.4 Catch Accounting of IC/SSF Provision

Goal: Create a system where annual IC/SSF landings are limited and there is accountability for overages.

Note: Under Option 2, the Board is not limited to one option. They can choose a combination of Option 2A and 2B or the sub-options.

> Option 1. IC/SSF landings do not count against a state allocation nor the annual TAC (status quo): Landings under this provision will be reported as a part of the annual FMP Review (Amendment 3, Section 5.3: Compliance Report). Landings are reported by states as a part of Annual Compliance Reports. Should a specific gear type show a continued and significant increase in landings under the provision, or it becomes clear that a non-directed gear type is directing on menhaden under this provision, the Board has the authority, through adaptive management (Amendment 3, Section 4.6), to alter the trip limit or remove that gear from the IC/SSF provision.

> Option 2. IC/SSF landings are evaluated against the annual TAC: Total landings under this provision would be evaluated against the annual TAC and will be reported as a part

of the annual FMP Review (Amendment 3, Section 5.3: Compliance Report). Landings are reported by states as a part of Annual Compliance Reports. If IC/SSF landings cause the TAC to be exceeded, meaning the TAC is exceeded after adding total IC/SSF landings to total landings that occur under state quotas and EESA, the trigger is tripped, and the Board must take action as specified in Options 2A-2B below.

Option 2A. Modify the Trip Limit for Permitted Gear Types in the IC/SSF Provision: The Board will evaluate the current IC/SSF trip limit and permitted gear types and take action to reduce the trip limit for one or more permitted gear types in the IC/SSF provision.

Sub-Option 1. The trip limit will be adjusted for one or more permitted gear types in the IC/SSF provision via Board action.

Sub-Option 2. The trip limit will be adjusted for one or more permitted gear types in the IC/SSF provision through adaptive management (Amendment 3, Section 4.6).

Option 2B. Modify Permitted Gear Types in the IC/SSF Provision: The Board will evaluate the permitted gear types in the IC/SSF provision and take action to eliminate one or more gear types from the IC/SSF provision.

Sub-Option 1. Permitted gear types in the IC/SSF provision will be adjusted via Board action.

Sub-Option 2. Permitted gear types in the IC/SSF provision will be adjusted through adaptive management (Amendment 3, Section 4.6).

4. COMPLIANCE SCHEDULE

If the existing Atlantic menhaden management plan is revised by approval of this draft addendum, the measures would be effective January 1, 2023. Unless otherwise directed by the Board, allocations will be revisited no more than 3 years (2025) following implementation of this addendum, as outlined in Amendment 3.

5. LITERATURE CITED

ASMFC. 2012. Amendment 2 to the Atlantic Menhaden Fishery Management Plan. ASMFC, Arlington, VA 114 p.

ASMFC. 2016. Addendum I to Amendment 2 to the Atlantic Menhaden Fishery Management Plan. ASMFC, Arlington, VA 7 p.

ASMFC. 2017. Amendment 3 to the Atlantic Menhaden Fishery Management Plan. ASMFC, Arlington, VA 111 p.

Bigelow, H.B., and Schroeder, W.C. 2002. Fishes of the Gulf of Maine. 3rd ed. Edited by B.B. Collette and G. Klein-MacPhee. Smithsonian Institution Press, Washington, D.C.

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: **Atlantic Menhaden Management Board**

FROM: **Atlantic Menhaden Plan Development Team**

DATE: **July 20, 2022**

SUBJECT: **Recommendations on Draft Addendum I to Amendment 3**

At the 2022 Spring Meeting, the Atlantic Menhaden Management Board provided further guidance to the Plan Development Team (PDT) to continue developing draft Addendum I to Amendment 3. The addendum considers changes to commercial allocations, the episodic event set aside (EESA) program, and the incidental catch and small-scale fisheries (IC/SSF) provision. This memo summarizes the PDT recommendations for the Board's consideration in approving the document for public comment.

Each section below includes justification for modifying and/or eliminating specific options. A decision tree for selecting state allocations is included in the Appendix. The topics are interconnected such that decisions made for one topic will impact alternatives under other topics. Because of this interconnectedness, the Board should carefully consider removal of some options to reduce complexity of the document. This will allow the public to effectively provide feedback to the Board before final action. Currently there are 35 total options in the Draft Addendum (16 combinations of allocation options; 3 options for the EESA program; and 16 options for the IC/SSF provision). **While the number of options has been significantly reduced, the PDT reiterates its recommendation that the Board continue to simplify the document as much as possible before approving for public comment.**

Commercial Allocations

3.1.2 Timeframe for Allocating Remaining Available TAC

Option 3B. Weighted Allocation Timeframe #2 (2009-2012 and 2017-2019 & 2021): **The PDT recommends removal of timeframe #2.** The Board requested two versions of the weighted allocation timeframe be developed in October 2021. While the state allocations vary slightly between the two versions, they are conceptually the same. By having two options, it increases the possible state allocation options by four options for a total of 16 options. **The PDT reiterates its recommendation that Timeframe #2 be removed because the same objective is achieved with Timeframe #1, which utilizes the original time series plus the most recent three years.**

Incidental Catch and Small-Scale Fisheries Provisions

3.3.2 Permitted Gear Types of the IC/SSF Provision

The PDT found two gear types that they felt should be reclassified. First, the PDT discovered that fyke nets were mistakenly listed as both a small-scale directed gear type and a non-directed gear type in Amendment 3, thereby creating a situation where fyke nets could be applied to two different sets of regulations. Additionally, in response to a Board request, the PDT reviewed the classification of trammel nets and decided that moving them to non-directed gear would be more consistent with their operation. **Therefore, in Options 2 and 3, the PDT chose to list both fyke and trammel nets as non-directed gear only. The PDT created Option 1 Sub-options 2 and 3 to provide a mechanism for the Board to still modify the gear type classifications in the event that the Board chooses to maintain the status quo of permitted gear types in the IC/SSF provision.**

At the Spring Meeting, the PDT was requested to review Option 3 and consider creating an exception for beach seines to continue operating if this option is selected. However, given that Options 1 and 2 both allow for beach seines to continue under the IC/SSF provision and that the intent of Option 3 is to create an IC/SSF provision where there is no menhaden directed fishery, such an exception would be contrary to the spirit of the option and the range that Options 1-3 present. Furthermore, the PDT is concerned that such an exception would be exploited to develop new directed fisheries under the IC/SSF provision. **Therefore, the PDT chose not to modify the option.**

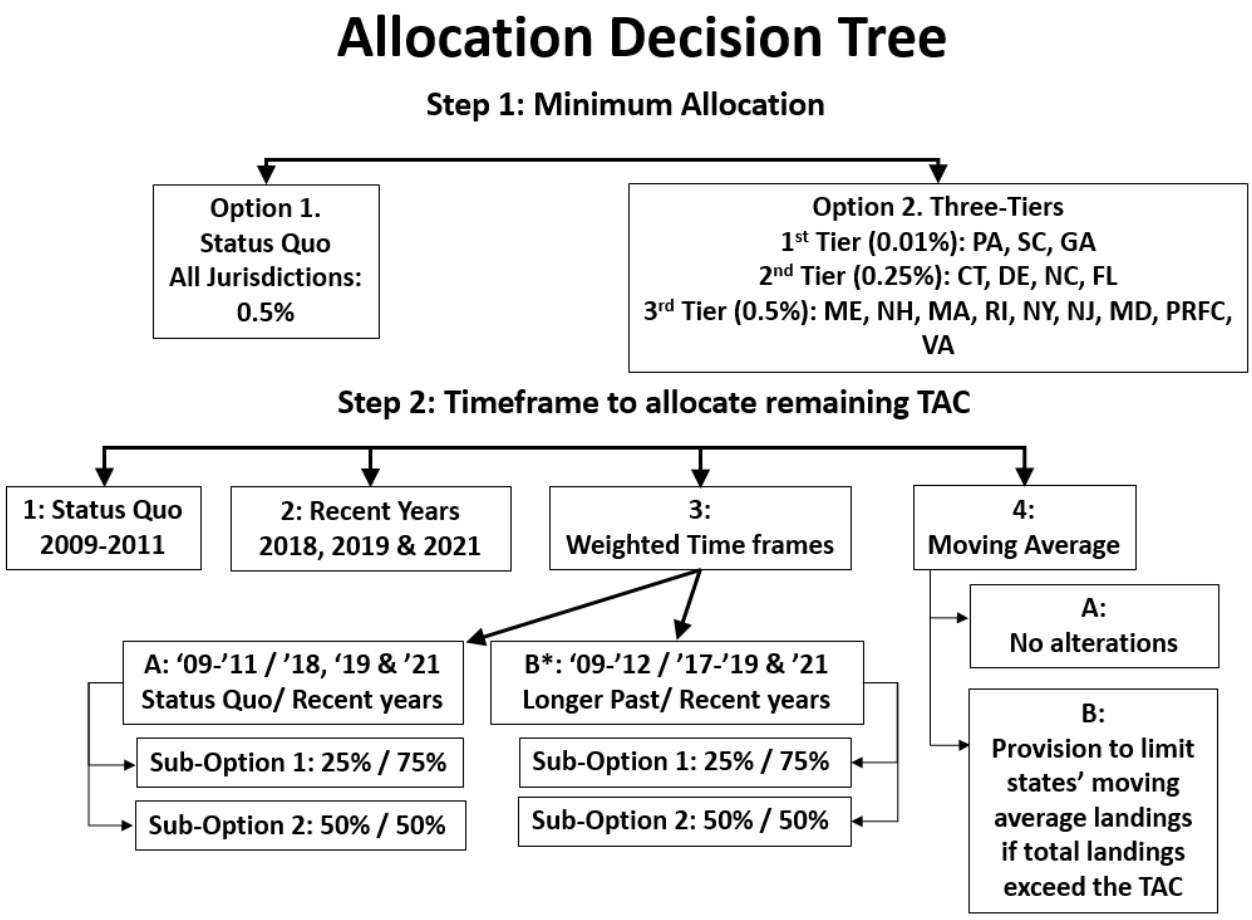
3.3.4 Catch Accounting of the IC/SSF Provision

Following Board modifications to 3.3.4 and requests for further management responses to an overage of the TAC caused by IC/SSF landings, the PDT developed Options 2A and 2B, which present the Board with mechanisms to impose trip limits or gear restrictions to reduce IC/SSF landings. However, the PDT feels that the process through which the Board should take action is strictly a management decision for the Board and will likely vary depending on the chosen action. Therefore, the PDT drafted sub-options for both Option 2A and Option 2B that give the Board the choice on whether the response will be carried out through board action or adaptive management (the development of a management document). The Board must weigh the advantages and disadvantages of these sub-options. Selecting the option of modifying trip limits or gear types through Board action will allow the Board to be more responsive to TAC overages caused by the IC/SSF provision, while adaptive management will allow for more time to collect public input on the impacts of modifications on trip limits or gear types. Ultimately, if the Board chooses to pursue either Option 2A or 2B through Board action, they may still elect to use adaptive management if they believe that the action suggested under these options warrants further public input and the development of a management document.

Appendix A. Decision Tree

The following provides a Decision Tree for selecting state allocations.

*The PDT recommends removing these options



Atlantic States Marine Fisheries Commission

2022 Atlantic Menhaden Stock Assessment Update

For Board Review

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

Atlantic States Marine Fisheries Commission

Atlantic Menhaden Stock Assessment Update

Prepared by the
ASMFC Atlantic Menhaden Stock Assessment Sub-Committee:
Amy Schueller (Chair), NOAA Fisheries
Kristen Anstead, Atlantic States Marine Fisheries Commission
Joseph Ballenger, South Carolina Department of Natural Resources
James Boyle, Atlantic States Marine Fisheries Commission
Jeffrey Brust, New Jersey Division of Fish and Wildlife
Matt Cieri, Maine Department of Marine Resources
Micah Dean, Massachusetts Division of Marine Fisheries
Katie Drew, Atlantic States Marine Fisheries Commission
Brooke Lowman, Virginia Marine Resource Commission
Jason McNamee, Rhode Island Department of Environmental Management
Ray Mroch, NOAA Fisheries
Josh Newhard, US Fish and Wildlife Service
Alexei Sharov, Maryland Department of Natural Resources
Chris Swanson, Florida Fish and Wildlife Research Institute

And the
ASMFC Atlantic Menhaden Technical Committee:
Josh Newhard (Chair), US Fish and Wildlife Service
James Boyle, Atlantic States Marine Fisheries Commission
Jeffrey Brust, New Jersey Division of Fish and Wildlife
Matt Cieri, Maine Department of Marine Resources
Ellen Cosby, Potomac River Fisheries Commission
Caitlin Craig, New York Department of Environmental Conservation
Micah Dean, Massachusetts Division of Marine Fisheries
Keilin Gamboa-Salazar, South Carolina Department of Natural Resources
Gary Glanden, Delaware Division of Fish and Wildlife
Kurt Gottschall, Connecticut Department of Energy and Environmental Protection
Eddie Leonard, Georgia Department of Natural Resources
Shanna Madsen, Virginia Marine Resource Commission
Jason McNamee, Rhode Island Department of Environmental Management
Ray Mroch, NOAA Fisheries
Amy Schueller, NOAA Fisheries
Alexei Sharov, Maryland Department of Natural Resources
Chris Swanson, Florida Fish and Wildlife Research Institute
Holly White, North Carolina Department of Environmental Quality

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

ACKNOWLEDGEMENTS

The Atlantic States Marine Fisheries Commission (ASMFC) thanks all of the individuals who contributed to the development of the Atlantic menhaden stock assessment update. The Commission specifically thanks the ASMFC Atlantic Menhaden Technical Committee (TC) and Stock Assessment Subcommittee (SAS) members who provided data and developed the stock assessment update report. Thank you to Atlantic Coastal Cooperative Statistics Program staff Adam Lee for validating landings. Thank you to Harvey Walsh (NOAA) for providing data for the EcoMon survey and James Gartland and Rob Latour (VIMS) for providing an update to the fecundity analysis.

EXECUTIVE SUMMARY

The purpose of this assessment was to update the 2019 Atlantic Menhaden Single-Species Benchmark Stock Assessment (SEDAR 2020a) with recent data from 2018-2021. The stock assessment update reran the peer-reviewed Beaufort Assessment Model (BAM) with a terminal year of 2021 and determined stock status of Atlantic menhaden using the ecological reference points (ERPs) defined in SEDAR 2020b and accepted for management use in 2020. This stock assessment update for Atlantic menhaden adopted the format of a Terms of Reference Report as developed by the Assessment Science Committee.

Landings

The Atlantic menhaden commercial fishery has two major components, a purse-seine reduction sector that harvests fish for fish meal and oil and a bait sector that supplies bait to other commercial and recreational fisheries. The first coastwide total allowable catch (TAC) for commercial landings for Atlantic menhaden was implemented in 2013 and has changed in value depending on the most recent stock assessment and management document. Incidental catch and recreational harvest are not counted toward the TAC. The current TAC for the 2021 and 2022 fishing seasons is 194,400 mt. Reduction landings have been steady since the implementation of the TAC, while bait landings have increased particularly in the northern states. For 2018-2021, reduction landings comprised about 70% of the coastwide landings. In 2021, bait and recreational landings were approximately 61,000 mt and reduction landings were approximately 136,700 mt.

Indices of Relative Abundance

The juvenile Atlantic menhaden index developed from 16 fishery-independent surveys showed the highest young-of-year abundance occurred during the 1970s and 1980s. Abundance has been lower since the 1990s with some moderate increases in the mid-2000s and 2016.

Three coastwide indices of adult abundance were developed from eight fishery independent survey data sets: northern (NAD; age-2+), Mid-Atlantic (MAD; age-1+), and southern (SAD; age-1) adult indices. The NAD indicated that age-2+ relative abundance has been variable, but abundance was high in 2012 and 2019-2021. The MAD showed high relative abundance in the late 1980s and then variable abundance with peaks in 2014 and 2015. The SAD indicated that age-1 abundance was high in 1990 and then declined through the 1990s. Abundance peaked again in 2006 and then remained variable through the terminal year.

Fishing Mortality

Highly variable fishing mortalities were noted throughout the entire time series and are dependent upon fishing and management policies, as well as stock status. The fishing mortality rate was highest in the 1970s and 1980s and has been declining since approximately 1990. The fishing mortality rate has been relatively stable since the mid-1990s and decreased in 2020 and 2021. Fishing effort in 2020 and 2021 was impacted by the COVID-19 pandemic with several vessels not operating due to restrictions.

Biomass

Biomass has fluctuated over time with a time series high in 1959 to a low in 1973. From 1990 to the present, biomass has increased. Biomass increased at a faster rate than abundance because of the increase in the number of older fish and an increase in weight-at-age.

Fecundity

Population fecundity (i.e., number of maturing ova) was highest in the early 1960s, low in the 1970s and 1980s, and high again from the 1990s to the present. The largest values of population fecundity were in 1955, 1961, and 2012. In the last decade, fecundity estimates were mostly between the ERP target and threshold with some years exceeding the target.

Stock Status

The fishing mortality rate for the terminal year of 2021 was below the ERP target and threshold and the fecundity was above the ERP target and threshold. Therefore, overfishing is not occurring and the stock is not considered overfished.

Table of Contents

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

This Terms of Reference (TOR) report describes the update to the single-species stock assessment for Atlantic menhaden (SEDAR 2020a). This assessment extends the fishery-independent and –dependent data for Atlantic menhaden through 2021, reruns the peer-reviewed Beaufort Assessment Model (BAM), and determines stock status of Atlantic menhaden using the ecological reference points (ERPs) defined in SEDAR 2020b and accepted for management use in 2020.

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.

The commercial reduction, commercial bait, and recreational landings time series were extended from the previous assessment (SEDAR 2020a) through 2021, along with the associated age compositions from the reduction and bait fisheries. For use in the BAM, landings were split into northern and southern regions as defined by waters north and south of Machipongo Inlet, Virginia, where the Chesapeake Bay is in the southern region.

Reduction landings were provided by the NOAA Fisheries Beaufort Lab. Reduction landings in the southern region have been slowly decreasing over the last few years while the northern reduction landings were increasing, although southern landings were larger than those in the north (Figure 1).

Bait landings from 1955-1984 were compiled from historic records whereas bait landings for 1985-2021 were validated with the states by the Atlantic Coastal Cooperative Statistics Program (ACCSP). Bait landings in the north increased in recent years and were over twice as much as landings in the south for the last four years (Figure 2). Several states revised their landings in the beginning of the validated time series (mid-1980s to mid-1990s) which resulted in higher landings than those in the benchmark (Figure 3). States routinely refine their landings as part of their internal data management processes and this updated time series represents the best data available. Particularly in the northern region, the revised landings resulted in a more abrupt change from the pre-1985 landings, which are from historic records and cannot be validated, to the post-1985 validated landings. The revised landings in the northern region did affect the base run of the BAM model and a bridge run has been done as part of TOR 4 to investigate the effects of this change on the results.

The Marine Recreational Fisheries Statistics Survey (MRFSS, 1981-2003) and the Marine Recreational Information Program (MRIP, 2004-2021) data sets were used to derive a time series of recreational landings of Atlantic menhaden. The uncertainty associated with recreational estimates for Atlantic menhaden is high and the landings are variable, although slightly higher in recent years (Figure 4). For use in the BAM, recreational harvest, which comprises less than 1% of coastwide harvest, was added to the bait landings. Reduction landings have remained relatively steady in the last few years with bait landings increasing over time, comprising 30% of coastwide landings in 2021 (Figure 5).

Commercial reduction and bait catch-at-age matrices were developed from the available biological data collected in each fishery by region. Age proportions of the bait catch were applied to the MRIP estimates of recreational catch and pooled with the bait catch-at-age.

See Appendix for supplemental tables (Table A1 – Table A5) for TOR 1.

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.

Sixteen fishery-independent surveys from Rhode Island to South Carolina were used to develop young-of-year (YOY) abundance indices which were then combined into a coastwide index of relative YOY abundance using the Conn method (Conn 2010; Table 1). Eight fishery-independent surveys from Connecticut to Georgia were developed into age 1+ abundance indices and were combined into three regional adult surveys: a northern adult index (NAD), a Mid-Atlantic adult index (MAD), and a southern adult index (SAD). Several surveys were affected by the COVID-19 pandemic and had no or limited sampling in 2020 and 2021 (Table 1). The Conn method for combining the individual indices into regional or coastwide composite indices can be used on surveys with different time series lengths or missing data and allowed for a terminal year of 2021 despite some surveys not operating during the pandemic.

The coastwide YOY index of relative abundance for Atlantic menhaden indicated high abundance in the 1970s and 1980s, with declines through the 1990s (Figure 6). YOY abundance remained low but slightly higher than the benchmark's terminal year value in 2017 (SEDAR 2020a) which was the lowest value in the time series. The NAD index predicted variable abundance throughout the time series with high abundance occurring in the terminal years of 2019-2021 (Figure 7). There is large uncertainty associated with the high terminal year estimates because all three surveys used in the NAD had at least one year of missing data due to the pandemic. The MAD index predicted high abundance in the beginning of the time series followed by a lower but variable abundance through the late 1990s-early 2010s (Figure 8). Abundance in the Mid-Atlantic region began to increase in the mid-2010s but then decreased and was variable through the terminal years with 2020 representing a time series low but 2021 indicating a mid-range abundance. The SAD index predicted high abundance in 1990 followed by low abundance through the mid-2000s (Figure 9). The index peaked again in 2006 but then decreased and was variable through the terminal year. For the NAD and MAD adult indices, length compositions were developed by combining data from each of the surveys and weighting the data by the inverse of the squared sigma values outputted from the Conn method.

An index of Atlantic menhaden spawning biomass was developed using larval abundance data collected from two regional ichthyoplankton surveys (MARMAP and EcoMon; Figure 10). The index increased in the last few years through the terminal year of 2020. Data from 2021 were not available. This index was included in the base run of the assessment model in SEDAR 2020a but was excluded in this update's base run due to issues with model fitting which will be discussed in TOR 4. Additionally, the SAS is recommending that this index is further investigated during the next assessment and included that research recommendation in TOR 7.

See Appendix for supplemental tables (Table A6 – Table A7) and figures (Figure A1- Figure A4) for TOR 2.

TOR 3. Life History Information and Model Parameterization

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.

Tabulated life history information and model inputs can be found in Table 2. Two changes were made in the data inputs or structure of the model in this stock assessment update from the benchmark other than adding additional years of data: the exclusion of the MARMAP and EcoMon ichthyoplankton surveys (MARECO) and the exclusion of the 2020 age composition data from the commercial bait fishery in the southern region due to small sample sizes. These changes are discussed in TOR 4 and sensitivity runs were developed to investigate those exclusions. The same time blocks for catch selectivity estimations used in SEDAR 2020a were used in this update. Since the last assessment (SEDAR 2020a), the fecundity information was updated by the Virginia Institute of Marine Science (R. Latour and J. Gartland, VIMS, unpublished data) using the same methods as was used for the benchmark.

TOR 4. Updated Beaufort Assessment Model

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.

The benchmark assessment was updated with all available data through the terminal year of 2021. Some changes were made to the updated run from the benchmark assessment, those changes included:

1. Censoring of the MARECO ichthyoplankton index;
2. Censoring of the commercial bait south age compositions for 2020;
3. The inclusion of penalties on some of the selectivity parameters that were hitting bounds during the estimation process.

These changes to the assessment update were considered thoroughly and are discussed below under the topics of sensitivity and bridge runs. Briefly, the quality and quantity of data at the end of the time series during the COVID-19 pandemic years caused some problems with estimation of parameters and the determination of year-class strength (recruitment). The update assessment retained the same method of recruitment estimation as used during the benchmark assessment. There is no formal stock-recruitment structure, rather median recruitment is estimated along with annual recruitment deviations from that median for the duration of the time series.

In general, the updated base run assessment is similar to the benchmark assessment. The model fit well to the landings for all four fleets. In general, the patterns in the age compositions

were random and did not exhibit any patterning. The fits to the indices were similar to the fits during the benchmark assessment and did not have runs in residuals. The fits to the NAD and MAD length compositions were also similar to the fits during the benchmark assessment. Selectivity for the fisheries and the indices were similar to the last assessment.

The fishing mortality rate (*F*) decreased in 2020 and 2021 and has been relatively stable since the mid-1990s (Figure 11). The recruitment class for 2019 and 2020 appears to be larger (Figure 12). However, the model does have difficulty estimating large year-classes in the terminal year of the model, as evidenced by the benchmark assessment. In addition, the sampling data for 2020 and 2021 are reduced because of the pandemic; thus, the status of the 2019 and 2020 year-classes may not be known until a further update to this assessment. Age-1+ biomass increased during the last three years, showing a steady increase (Figure 13). Finally, fecundity has been stable during the most recent years, but a large increase was estimated for 2021 (Figure 14). That rise in fecundity was due to an increase in fecundity for age-2 individuals, which is linked to a larger estimated year class in 2019. The SAS cautions that the assessment had difficulty during the benchmark estimating recruitment in the terminal years; specifically, the larger recruitment class estimated during the benchmark was estimated to be lower in this assessment. Thus, additional years of data in the next assessment will determine whether the 2019 year class remains larger or not. Until that time, the SAS notes this as an uncertainty.

The SAS evaluated one bridge run for the update assessment to address the changes in the validated northern commercial bait time series of landings which was updated by the states. The landings for this update are the best scientific information available and the most accurate time series of landings data available. Thus, this bridge run was completed for illustrative purposes. The SAS found that the largest difference between the base run results and the bridge run were in mid-1980s estimates of *F* on ages 2-4, as expected. The SAS was satisfied that the change in historical bait landings did not result in significant changes in model fit or a difference in stock status.

A series of sensitivity runs were completed to determine the best approach regarding the 2020 and 2021 data. During 2020 and 2021, the pandemic led to reduced or missing data for some fishery-dependent and –independent sampling programs. With the reduced sample sizes, the data that were collected in 2020 and 2021 did not necessarily reflect the same spatial and temporal extent as past years of data. Thus, the SAS choose to run several sensitivity runs including and excluding the 2020 and 2021 data to determine the impacts on the assessment outcomes. The sensitivity runs included:

1. Censoring all 2020 and 2021 data;
2. Including all 2020 and 2021 data;
3. Including the 2020 and 2021 data except for the commercial bait south 2020 age compositions while also including the MARECO or ichthyoplankton index.

Overall, these sensitivity runs demonstrated that the terminal year age composition data inform terminal year recruitment values. Without those data, the terminal year recruitment values are centered on the mean recruitment values.

A set of sensitivity runs was also completed to investigate the inclusion of the MARECO (the ichthyoplankton index). These sensitivity runs included some of those already described above whereby the index was censored or not in combination with the inclusion or censoring of the 2020 and 2021 data. Additionally, the SAS considered runs whereby the terminal year of data for this index was censored with runs with MARECO data until 2014-2020. When updating the assessment, the MARECO index was causing difficulty for parameter estimation and Hessian inversion for the model, as well as the gradient for the final solution being larger than the criterion. Upon further investigation, the MARECO index did not seem to reflect the population trend as well as other data sources. For example, the pattern of the observed MARECO index was not consistent with estimated spawning stock biomass trends despite being used as an indicator of fecundity in the population (Figure 15). The model was unable to match the increase of the MARECO index given the fits to the other indices, landings, and composition data. These discrepancies could occur for many reasons. First, the MARECO index is an ichthyoplankton index while the other indices directly measure older individuals. Second, mechanisms relating the ichthyoplankton index to the population status are difficult to discern given the unknown drivers between the fecundity/larval abundance stage and recruitment. Many potential biological mechanisms could be considered, but the SAS does not have the data to do so at this time. In addition, 2020 and 2021 data are generally atypical within the assessment, thus the MARECO index may be garnering more weight and influence in the model, which could lead to a larger gradient. During the benchmark assessment (SEDAR 2020a), the SAS noted numerous adjustments that needed to be made in order to develop a reasonable MARECO index including removal of strata, removal of months, and adjustments to account for inconsistencies in the two survey methodologies. Given these previous challenges and the influence of the other data issues created by the pandemic, it is not surprising that the use of this index for the update proved problematic for model convergence. While the MARECO index is dropped for this update, the SAS would like to investigate this topic further in future assessments. One option the SAS could consider is using nonlinear relationships between catchability and the MARECO index.

A retrospective analysis was completed for the update assessment. A series of runs were done removing the terminal year data in sequence. The update assessment had a terminal year of 2021, and the retrospective analysis was run back through a terminal year of 2016. Overall, the retrospective runs fall within the uncertainty bounds from the uncertainty analysis. While the SAS completed a retrospective analysis for this assessment, they urge caution when interpreting the results as 2020 and 2021 data were influenced by the pandemic, as described above.

A Monte Carlo bootstrap (MCB) uncertainty analysis was completed as was done for the last benchmark assessment. The configuration was kept exactly the same with uncertainty in natural mortality and fecundity. A total of 5,000 runs were completed. Some runs were excluded due to gradients, leaving 4,868 MCB runs for analysis. Overall, the uncertainty was large for all the metrics of interest. A Monte Carlo Markov Chain analysis (MCMC) was completed for the previous benchmark but not run for this update assessment. As noted in the benchmark assessment, while the MCB analysis may overestimate the uncertainty surrounding the base run, the MCMC analysis is an underestimate of the uncertainty surrounding the base

run. Hence, the MCB analysis is a more conservative approach and was the preferred uncertainty analysis.

See Appendix for supplemental tables and figures for TOR 4: model fits to landings (Figure A5 - Figure A8) and associated age comps (Figure A9 - Figure A16), model fits to indices (Figure A17 - Figure A20) and associated length comps (Figure A21 - Figure A24), estimated selectivities (Figure A25 - Figure A30), model estimated *F*, recruitment, biomass, and fecundity (Figure A31 - Figure A38), bridge runs (Figure A39 - Figure A46), sensitivity runs (Figure A47 - Figure A63), and the retrospective analysis (Figure A64 - Figure A71).

TOR 5. Stock Status

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

The Atlantic Menhaden Management Board (Board) adopted ERPs in Amendment 3. Thus, stock status was determined using those benchmarks. The fishing mortality rate for the terminal year of 2021 is below the ERP threshold and target ($F_{2021}/F_{\text{ERPThreshold}} = 0.28$; $F_{2021}/F_{\text{ERPTarget}} = 0.85$; Figure 16), and the fecundity for the terminal year of 2021 is above the ERP threshold and target ($FEC_{2021}/\text{F}EC_{\text{ERPThreshold}} = 1.76$; $FEC_{2021}/FEC_{\text{ERPTarget}} = 1.28$; Figure 17). Therefore, overfishing is not occurring and the stock is not overfished (Table 3).

The uncertainty in the stock status was evaluated through the MCB analysis. The terminal year *F* was below the ERP threshold for all of the MCB runs (Figure 18) and the terminal year fecundity was above the ERP threshold for all of the runs (Figure 19). The SAS does note that each MCB run was not run through the ERP's Northwest Atlantic Coastal Shelf Model of Intermediate Complexity for Ecosystems (NWACS-MICE) model, thus the benchmark comparisons were to those from the base run. The MCB plots are not internally consistent for each run, but do give an idea of the uncertainty related to the ERP benchmarks, which agrees with the base run stock status determinations.

TOR 6. Projections

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

Short-term projections at the current Total Allowable Catch (TAC) of 194,400 mt were provided. At a TAC of 194,400 mt, the fishing mortality rate is below the ERP threshold and target, and the fecundity is above the ERP threshold and target (Figure 20). Further projections based on different removal levels will be analyzed at the Board's request.

The projections have the same methods and assumptions as those run for the benchmark assessment. It is important to note that uncertainty is accounted for in the projections. Additionally, during the benchmark (SEDAR 2020a), the SAS used a new procedure for recruitment in the projections. Instead of assuming a static median value for recruitment, as is done for many assessment projection methodologies, recruitment was projected using nonlinear time series analysis methods (Deyle et al 2018). Specifically, projections were based on the MCB runs, which allows recruitment to change from year to year in the projections

based on how recruitment has changed in the past under similar conditions. Thus, uncertainty is recognized in the recruitment time series and the methods used for projections adequately accounted for that uncertainty using the best scientific methods available. However, the board should still consider these uncertainties in the context of risk when using the projection information for management.

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 long-standing research recommendation for Atlantic menhaden is to develop and implement a multi-year coastwide fishery-independent survey. It was noted in SEDAR 2020a that even area-specific surveys could provide substantial improvements over the indices currently used in the assessment. With that in mind, Congress included a Chesapeake Bay Atlantic Menhaden Abundance provision in the Fiscal Year 2022 Consolidated Appropriations Act (Public Law No: 117-103) encouraging NOAA Fisheries, in partnership with ASMFC and relevant states, to collect Atlantic menhaden abundance data in the Chesapeake Bay. Progress to address this research recommendation was made in 2020 when Wilberg et al. completed a project to evaluate survey designs for a combined aerial-hydroacoustic survey for Atlantic menhaden biomass in the Chesapeake Bay which was reviewed and endorsed by the TC. Regardless, no funding has been attached to the project and it remains unimplemented.

Despite the research recommendation to continue the current level of sampling from the fisheries, some sampling was reduced or temporarily discontinued due to the COVID-19 pandemic. For example, biological sampling from the bait and reduction fisheries occurred at lower samples sizes or not at all for 2020 and 2021. There is no expectation that those trends will continue following the pandemic and sampling is likely to increase to pre-pandemic levels. Similarly, an ageing workshop for Atlantic menhaden to assess precision and error among readers has not been initiated, despite plans for it in 2020, due to the pandemic and interest from agers to conduct the workshop in person.

In 2021, responding to the research recommendation to develop a spatially-explicit model for Atlantic menhaden, the Board tasked the TC and Ecological Reference Point Work Group (ERP WG) with identifying data needs and timelines for the development of that model. The TC and ERP WG produced a memo on potential spatially-explicit approaches, which highlighted that completing the task would likely extend the timeline for the next benchmark assessment, currently scheduled for 2025. The Board indicated that completing the benchmark stock assessment in 2025 as planned was the highest priority. Therefore, the next benchmark assessments will focus on refining the ERP approach developed in SEDAR 2020a and 2020b. While some spatial considerations may be incorporated in the process of refining the ERP models, spatial modeling will not be pursued until the 2025 benchmark assessments are completed.

During the next benchmark stock assessment process (scheduled for 2025), the SAS recommends that the MARECO index still be considered for inclusion in the model, but further

investigation is necessary. One option the SAS could consider is using nonlinear relationships between *q* and the MARECO index. Additionally, the SAS recommends that ACCSP continues to work with the states to validate bait landings and resolve the transition in the time series from pre-1985 bait landings in the northern region.

All research recommendations from SEDAR 2020a and 2020b remain important to the continued assessment of Atlantic menhaden, including those updated in this section. Please refer to the appendices at the end of this report for the complete list.

REFERENCES

Atlantic States Marine Fisheries Commission (ASMFC)

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

Deyle, E., A.M. Schueller, H. Ye, G.M Pao, and G. Sugihara. 2018. Ecosystem-based forecasts of recruitment in two menhaden species. Fish and Fisheries 19: 769-781.

Southeast Data, Assessment, and Review (SEDAR). 2020a. SEDAR 69 - Atlantic Menhaden Single-Species Benchmark Stock Assessment and Peer Review Report. SEDAR, North Charleston, SC. 691 pp.

_____. 2020b. SEDAR 69 – Atlantic Menhaden Ecological Reference Point Benchmark Assessment and Peer Review Report. SEDAR, North Charleston, SC. 560 pp.

Wilberg, M., D. Liang, and H. Bi. 2020. Evaluating alternative designs for a combined aerial-hydroacoustic survey of Atlantic menhaden biomass in Chesapeake Bay. Final Report to: Atlantic States Marine Fisheries Commission. Solomons, Maryland. 135 pp.

TABLES

Table 1. Fishery-independent surveys included in the coastwide young-of-year (YOY) and regional adult Atlantic menhaden abundance indices (Northern Adult Index, NAD; Mid-Atlantic Index, MAD; Southern Adult Index, SAD).

Conn Index	Fishery-Independent Survey (years of data)	Months	Length
NAD	CT LISTS (1996-2009, 2011-2019, 2021)	Sept-lagged Jan	1990-2021
	DB Adult Trawl (1990-2021)		
	NJ Ocean Trawl (1990-1997, 1999-2019)		
MAD	MD Gill Net (1985-1995, 1998-2002, 2005-2021)	March-May	1985-2021
	VIMS Shad Gill Net (1998-2021)		
SAD	NC p915 (2008-2019)	April-July	1990-2021
	SEAMAP (1990-2019)		
	GA EMTS (2003-2021)		
YOY	RI Trawl (1990-2021)	Varies by survey	1959-2021
	CT LISTS (1996-2009, 2011-2017)		
	CT River Alosine (1987-2021)		
	CT Thames River Alosine (1998-2016)		
	NY Juvenile Striped Bass Seine (2000-2021)		
	NY Peconic Bay Trawl (1987-2021)		
	NY WLIS Seine (1986-2021)		
	NJ Ocean Trawl (1990-2019)		
	NJ Striped Bass YOY Seine (1986-2019, 2021)		
	DB Inner Bays (1986-2021)		
	MD Coastal Trawl (1972-1992, 1994, 1998-2021)		
	MD Juvenile Striped Bass (1959-2021)		
	VIMS Juvenile Trawl (1990-2021)		
	VIMS Striped Bass Seine (1968-1972, 1980, 1982, 1985-2021)		
	NC p120 (1989-2021)		
	SC Electrofishing (2001-2021)		

Table 2. Model structure and life history information used in the stock assessment.

	Value(s)
Years in Model	1955-2021
Age Plus Group	6+
Fleets	2 (north and south regions for bait and reduction fisheries)
Fecundity	Time-varying fecundity-at-age
Natural Mortality	Age-varying natural mortality
Maturity	Time-varying maturity-at-age based on length-at-age
Sex Ratio	Fixed at 1:1 for males:females

	Age Group						
	0	1	2	3	4	5	6+
Natural Mortality	1.76	1.31	1.03	0.90	0.81	0.76	0.72

Table 3. Current fishing mortality (*F*) and fecundity (*FEC*) ecological reference points (ERP targets and thresholds) along with terminal year values from the base run of the BAM for the stock assessment update for determining stock status. Fecundity is in billions of eggs.

Reference Point	ERP Value	2021 Value	Stock Status
$F_{THRESHOLD}$	0.57	0.16	Not Overfishing
F_{TARGET}	0.19		
$FEC_{THRESHOLD}$	1,492,854	2,570,080	Not Overfished
FEC_{TARGET}	2,003,986		

FIGURES

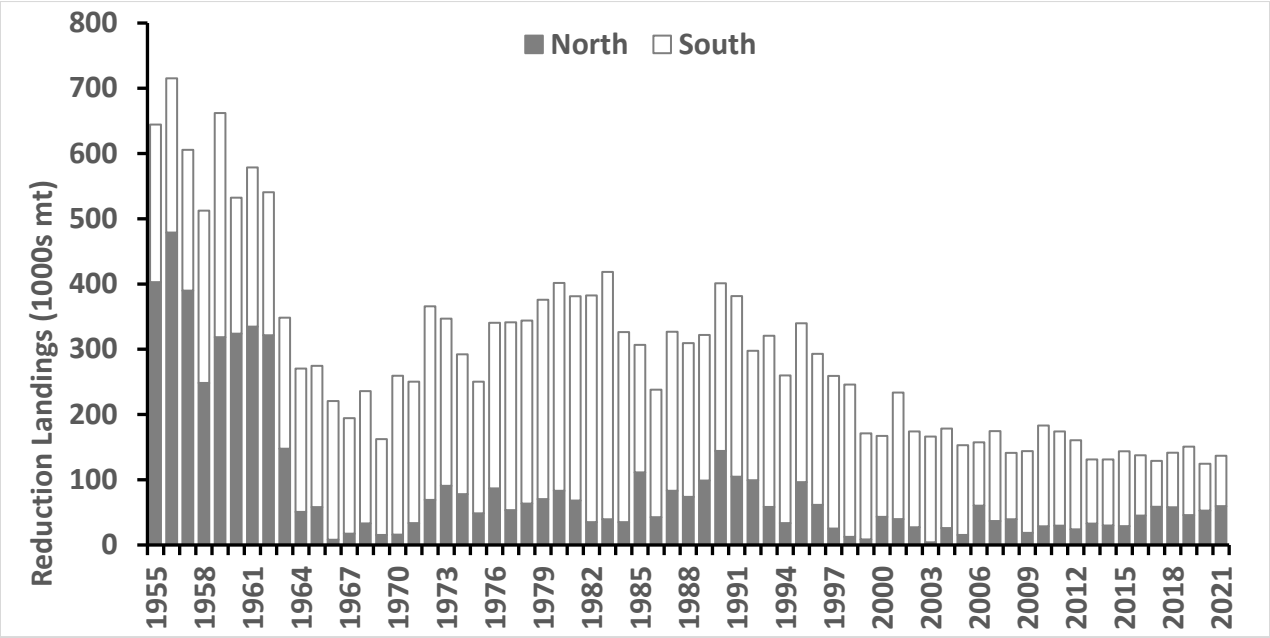


Figure 1. Atlantic menhaden reduction landings (1000s mt) from 1955-2021. The northern region is comprised of landings from north of Virginia Eastern Shore and the southern region is comprised of landings from Virginia Eastern Shore and Chesapeake Bay through Florida (Source: NOAA Fisheries Beaufort).

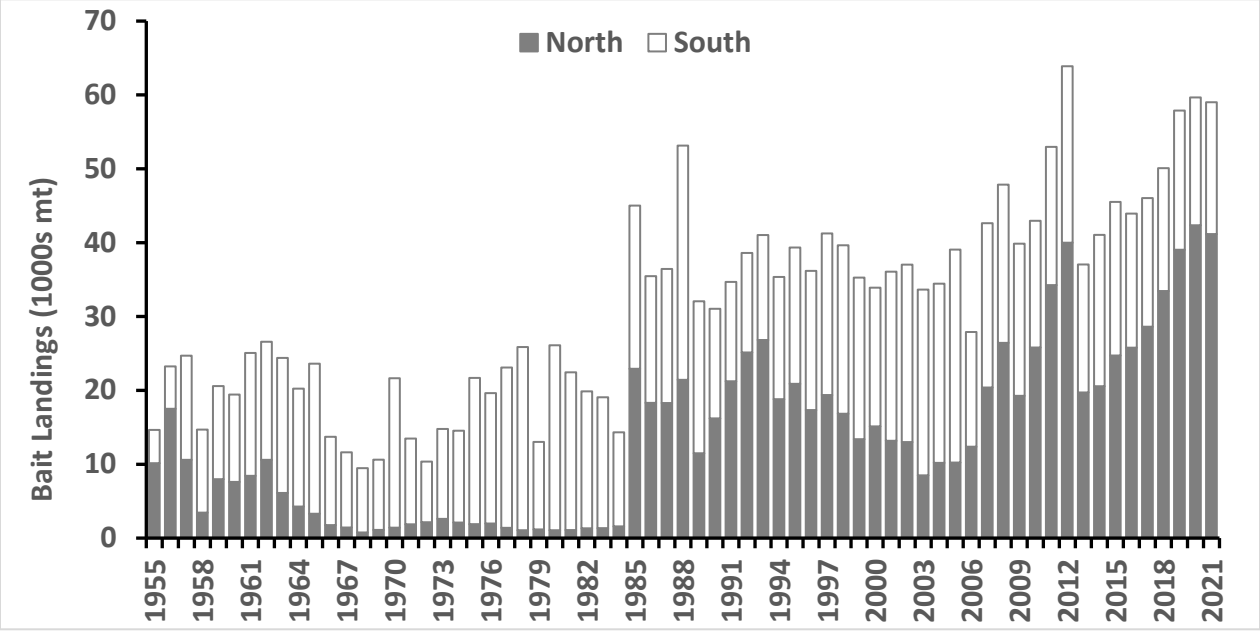


Figure 2. Atlantic menhaden bait landings (1000s mt) from 1955-2021. The northern region includes landings from Maine to Maryland's Eastern Shore, excluding the Chesapeake Bay. The southern region includes landings from the Chesapeake Bay to Florida. Only landings from 1985 on can be validated (Source: ACCSP).

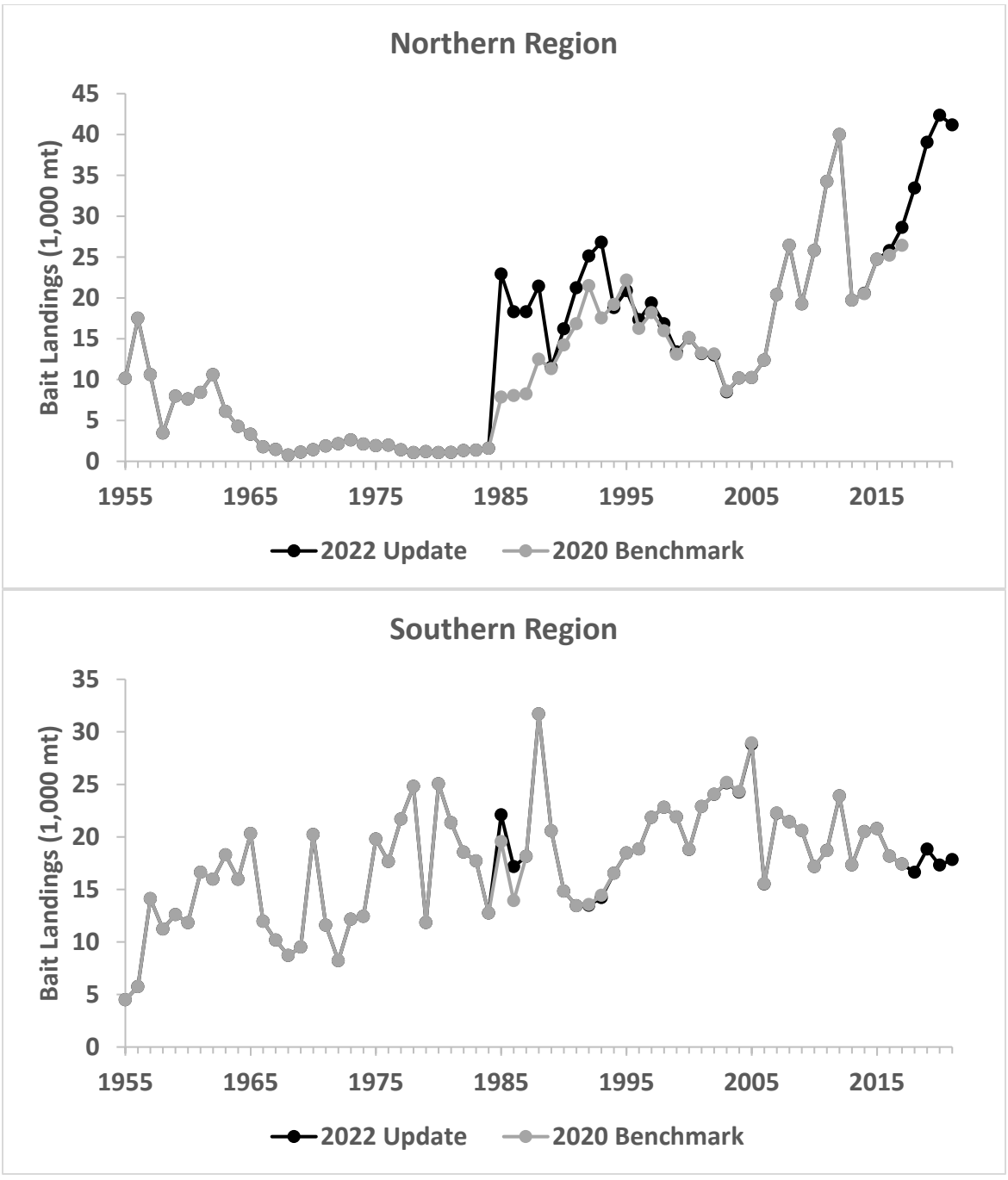


Figure 3. Differences between bait landings from the benchmark and update by region.

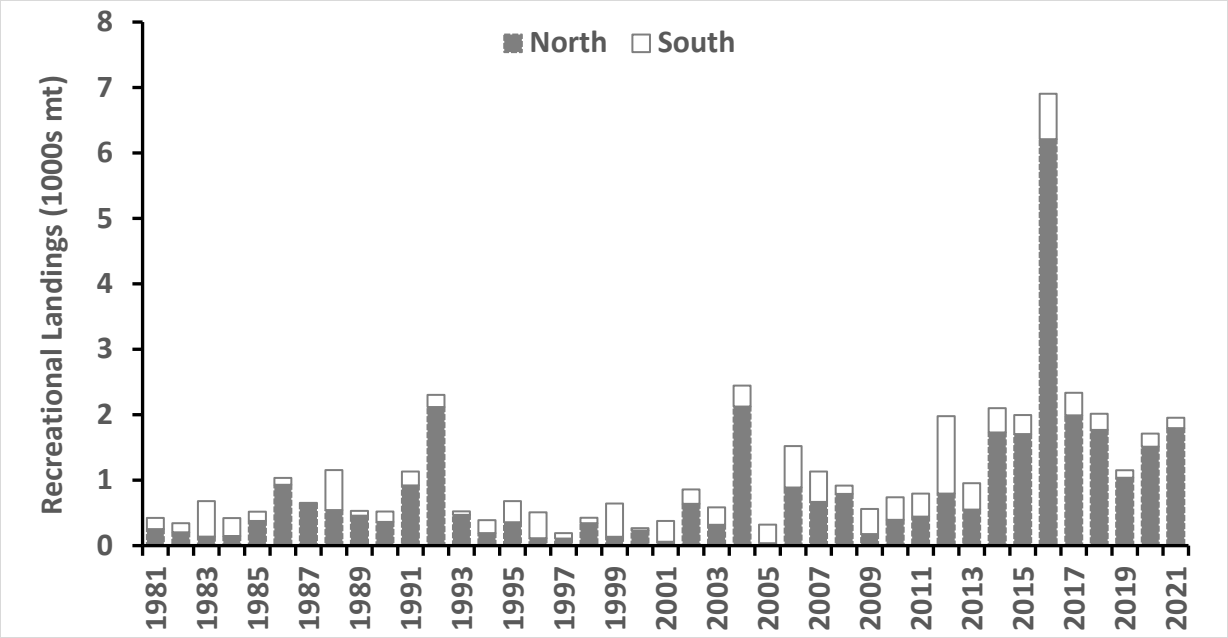


Figure 4. Atlantic menhaden recreational landings (1000s mt) from 1981-2021. The northern region includes landings from Maine to Maryland's Eastern Shore, excluding the Chesapeake Bay. The southern region includes landings from the Chesapeake Bay to Florida (Source: MRIP).

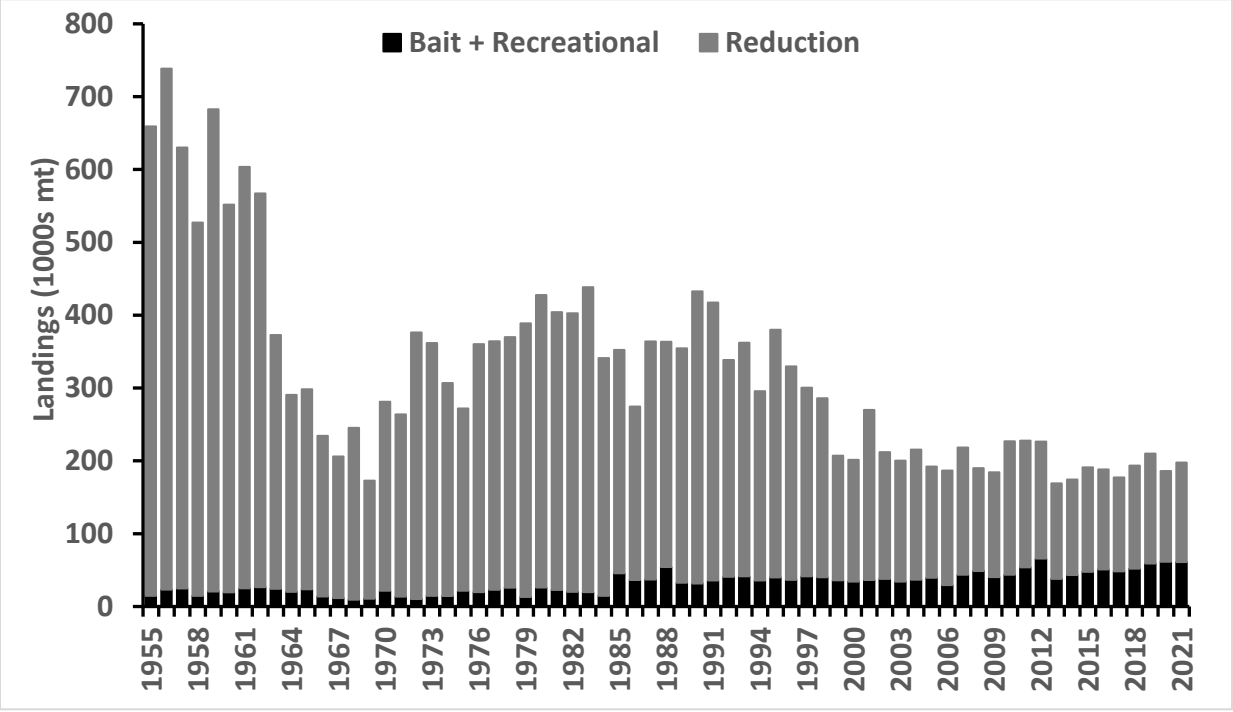


Figure 5. Coastwide Atlantic menhaden landings for the reduction and bait fisheries (1955-2021).

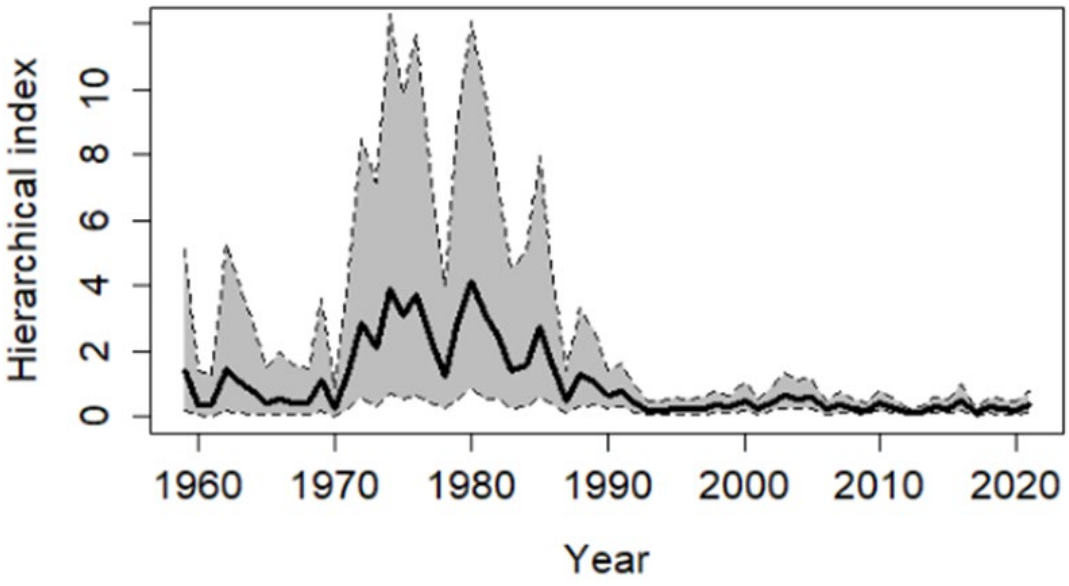


Figure 6. Time series of the young-of-year (YOY) Atlantic menhaden relative abundance index as estimated from hierarchical analysis (Conn 2010). The black line gives the posterior mean and the grey, dashed lines represent a 95% credible interval about the time series.

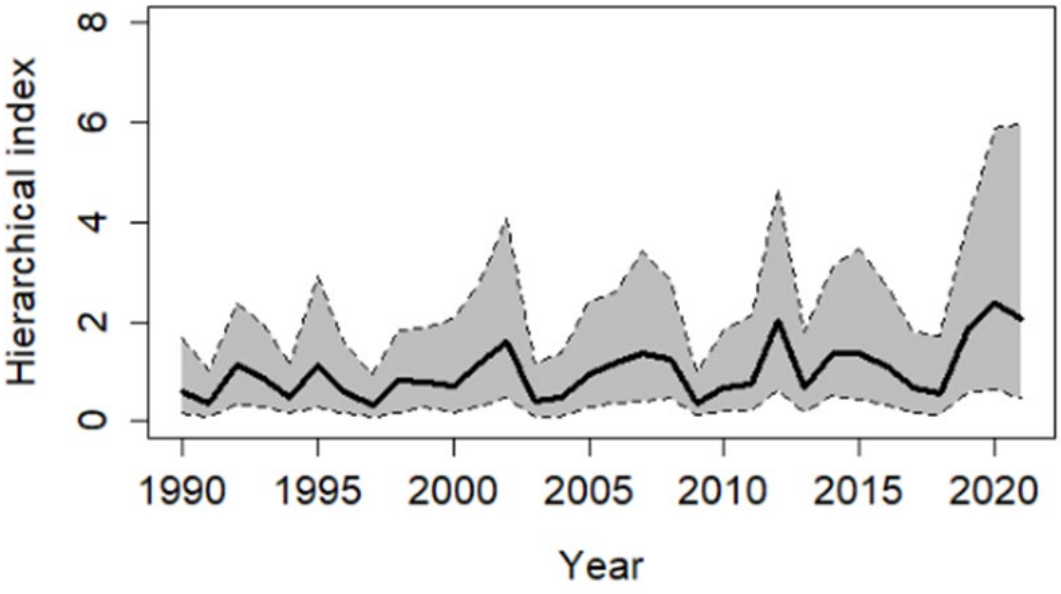


Figure 7. Time series of the northern adult Atlantic menhaden relative abundance index (NAD) as estimated from hierarchical analysis (Conn 2010). The black line gives the posterior mean and the grey, dashed lines represent a 95% credible interval about the time series.

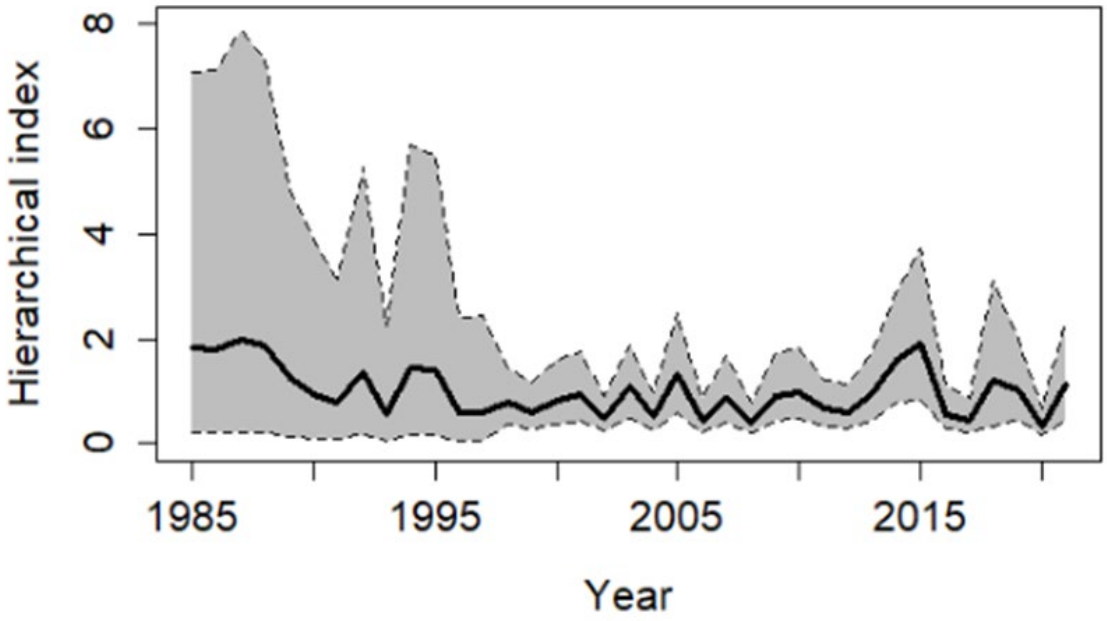


Figure 8. Time series of the Mid-Atlantic adult menhaden relative abundance index (MAD) as estimated from hierarchical analysis (Conn 2010). The black line gives the posterior mean and the grey, dashed lines represent a 95% credible interval about the time series.

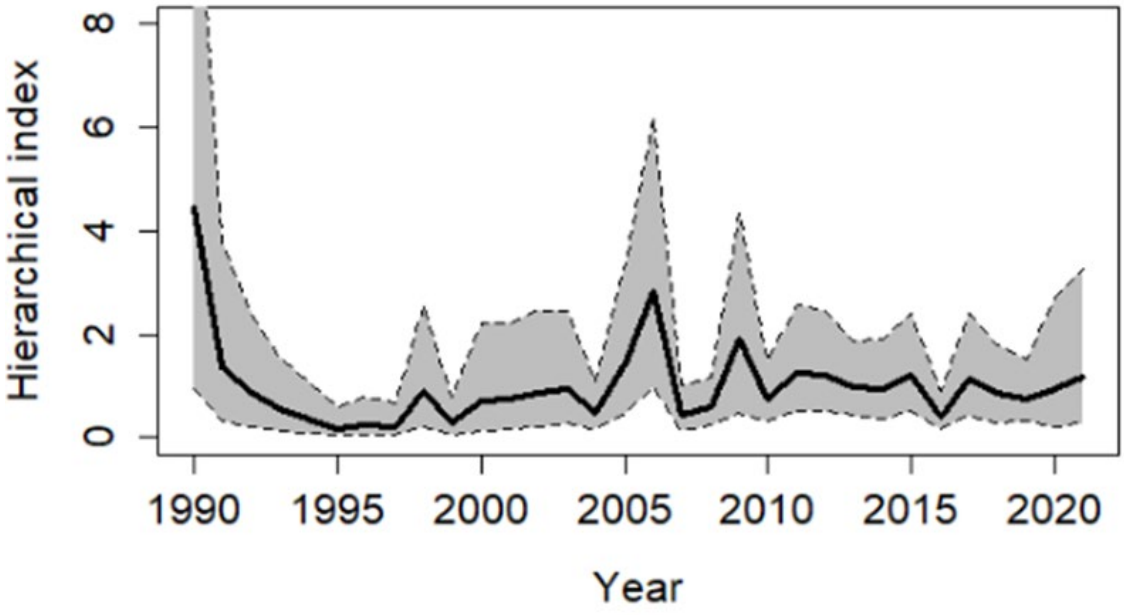


Figure 9. Time series of the southern adult Atlantic menhaden relative abundance index (SAD) as estimated from hierarchical analysis (Conn 2010). The black line gives the posterior mean and the grey, dashed lines represent a 95% credible interval about the time series.

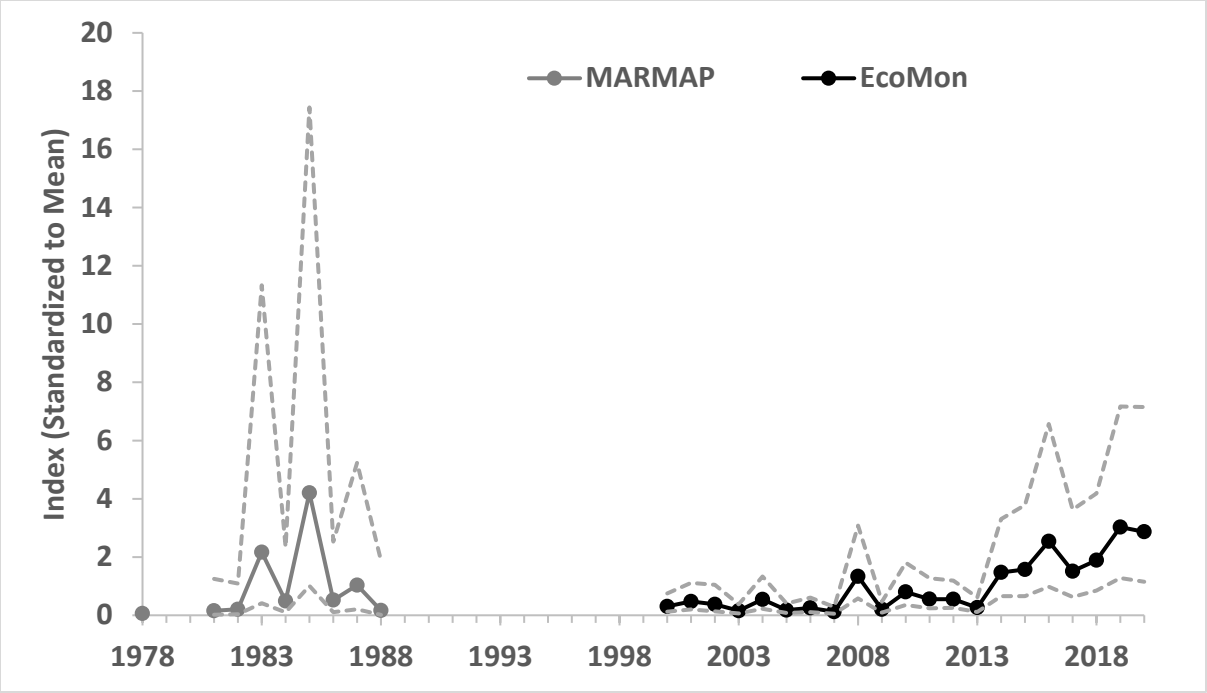


Figure 10. Standardized index of relative spawning stock biomass abundance of Atlantic menhaden developed from the MARMAP and EcoMon ichthyoplankton surveys. Dashed lines represent 95% confidence intervals. The 1978 upper confidence interval has not been included on the graph because of its large value (94).

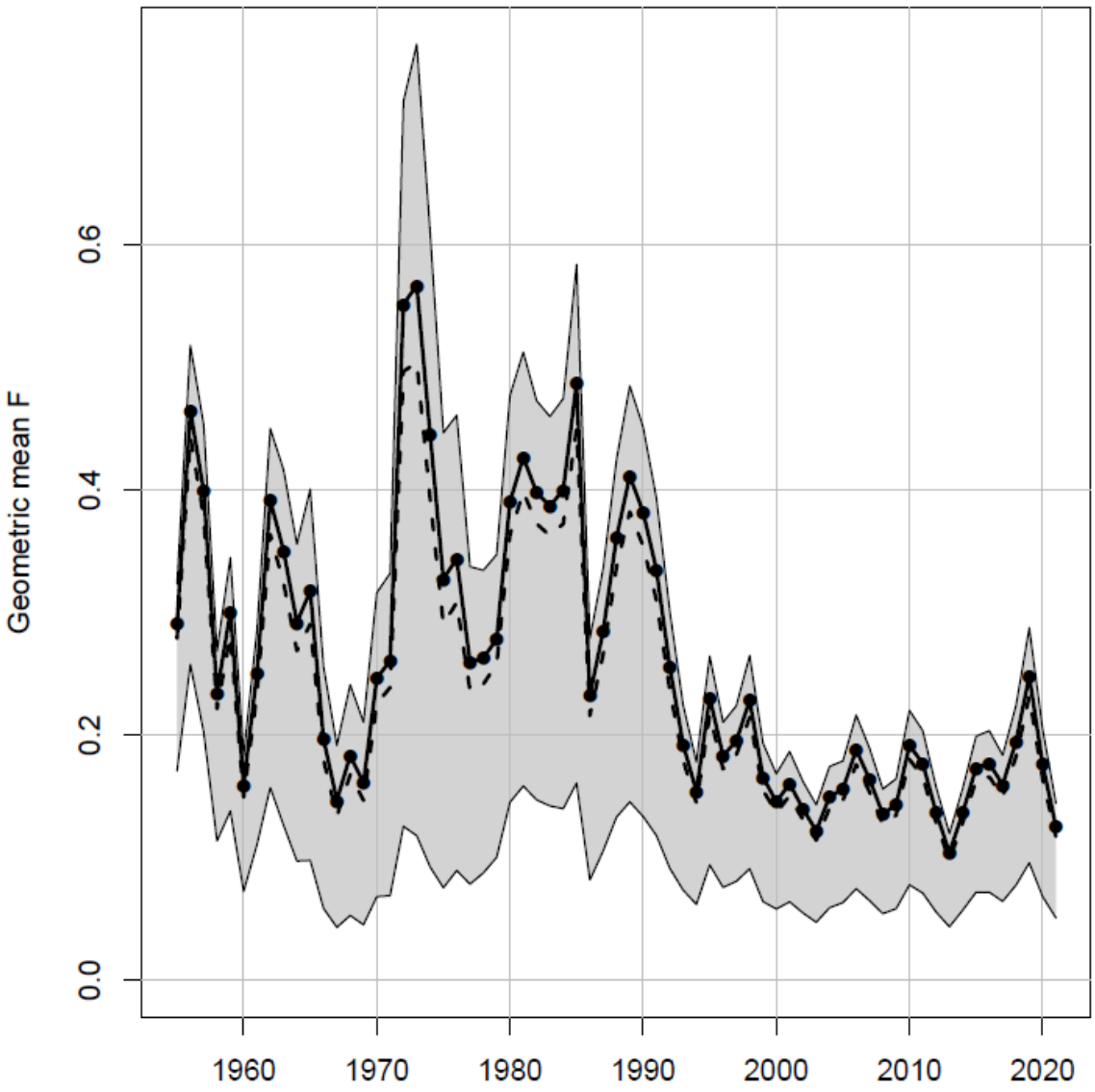


Figure 11. Time series of the geometric mean fishing mortality rate for ages-2 to 4 from 1955-2021 for the Monte Carlo bootstrap runs. The grey represents the 5th and 95th percentiles across the runs, while the black line with closed black circles represents the base run. The dashed line represents the median of the MCB runs.

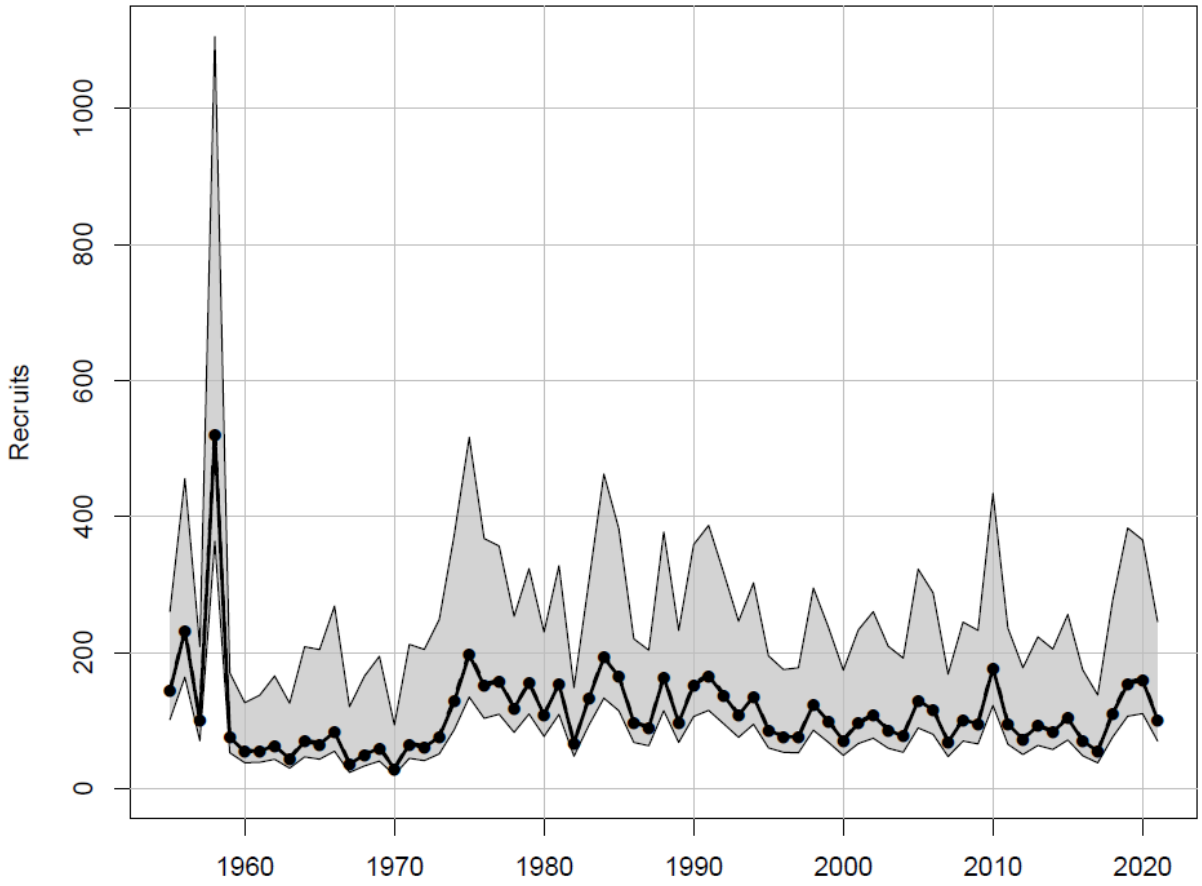


Figure 12. Estimated recruitment over time from 1955-2021 for the Monte Carlo bootstrap runs. The grey represents the 5th and 95th percentiles across the runs, while the black line with closed black circles represents the base run.

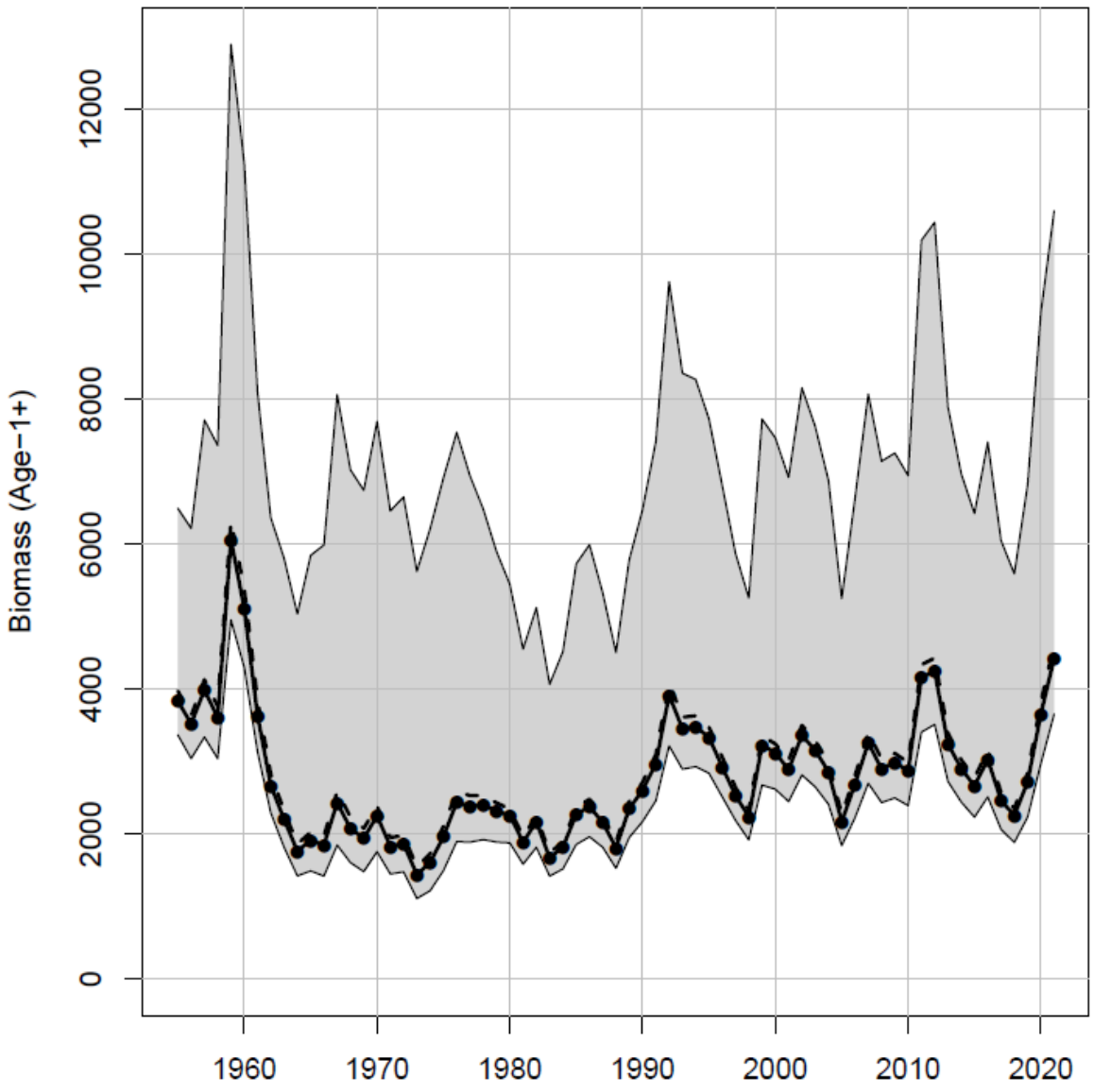


Figure 13. Time series of age-1+ biomass from 1955-2021 for the Monte Carlo bootstrap runs. The grey represents the 5th and 95th percentiles across the runs, while the black line with closed black circles represents the base run. The dashed line represents the median of the MCB runs.

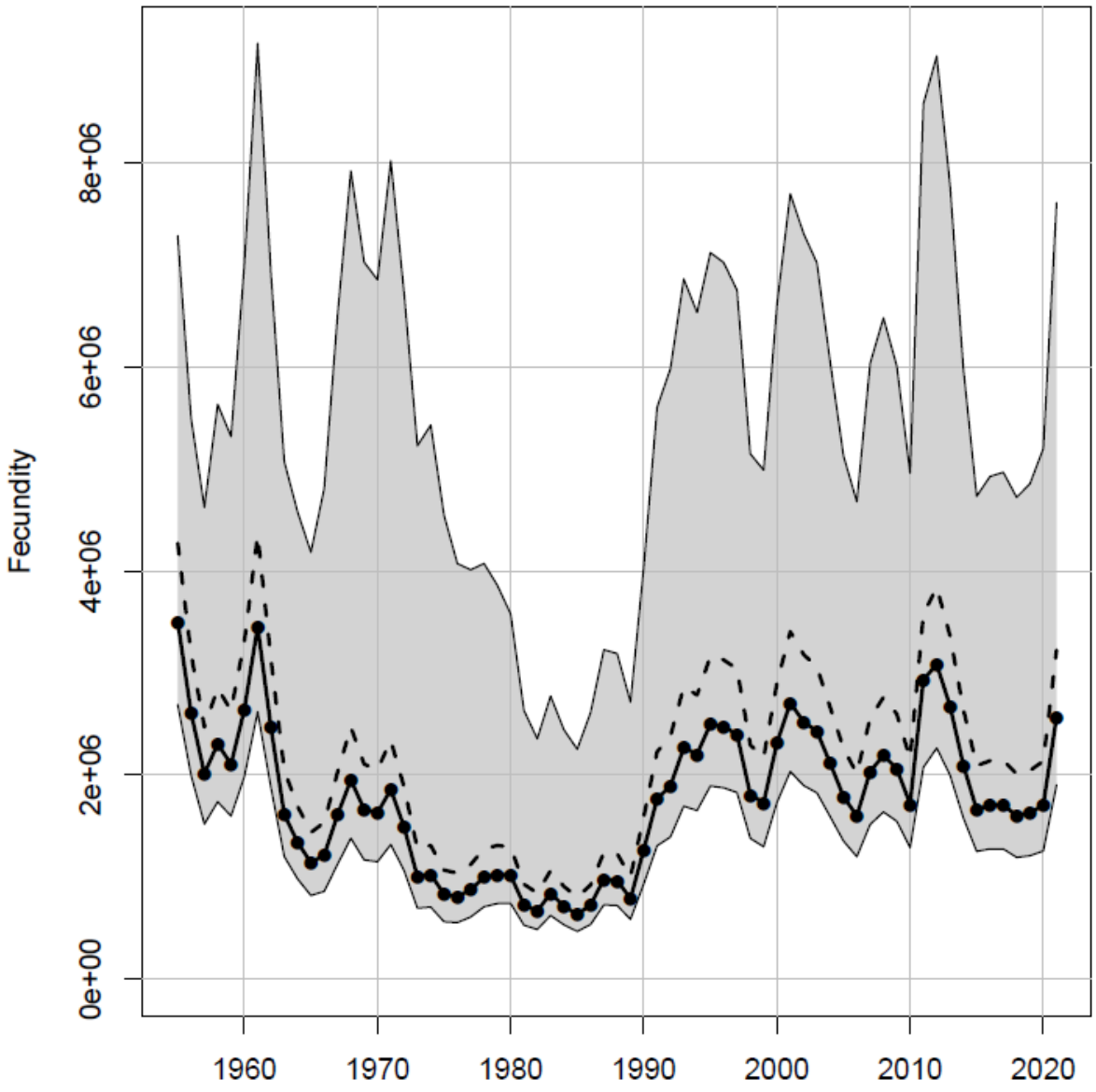


Figure 14. Time series of fecundity from 1955-2021 for the Monte Carlo bootstrap runs. The grey represents the 5th and 95th percentiles across the runs, while the black line with closed black circles represents the base run. The dashed line represents the median of the MCB runs.

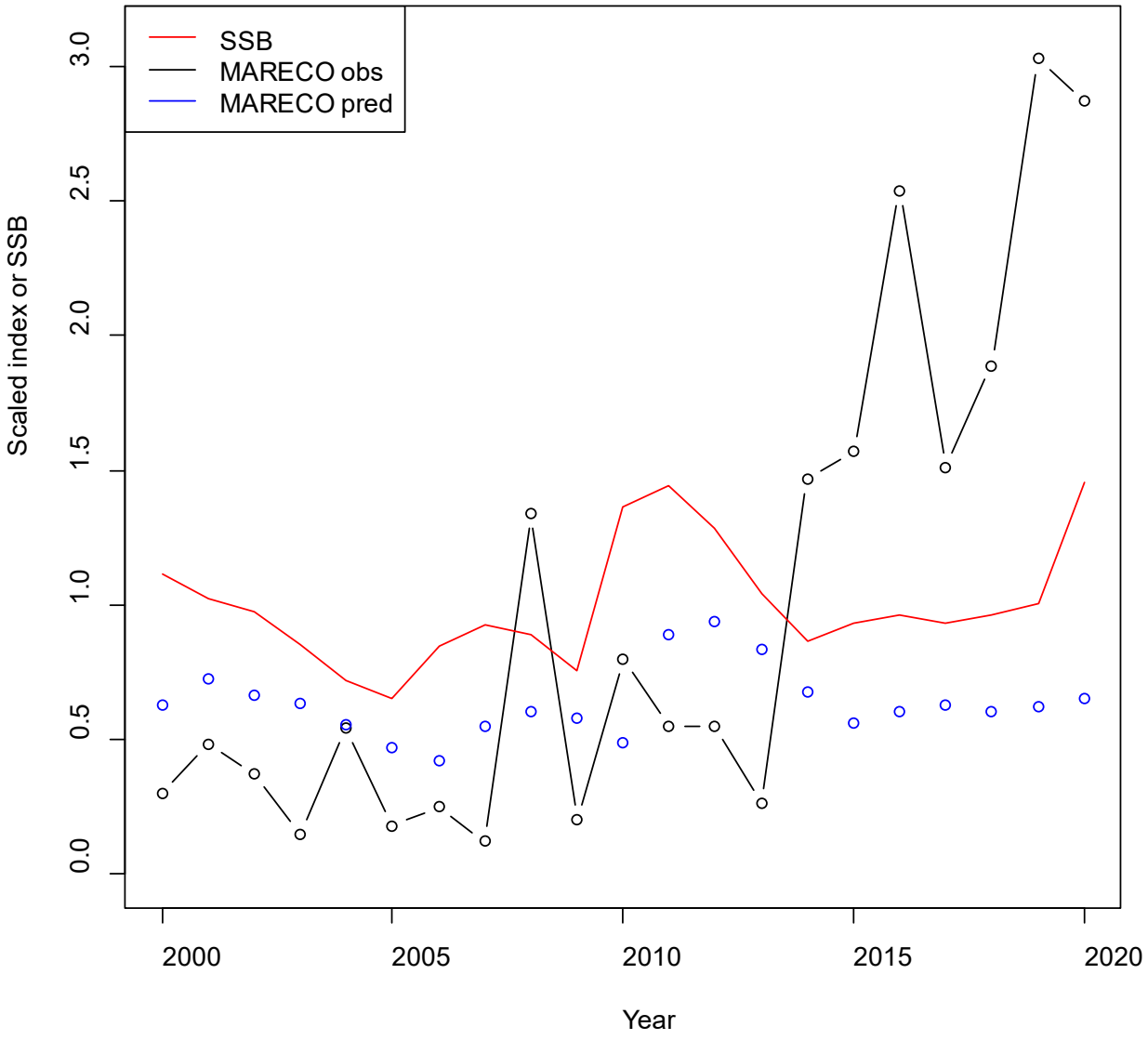


Figure 15. Observed and predicted values for the MARECO index and estimated spawning stock biomass (SSB).

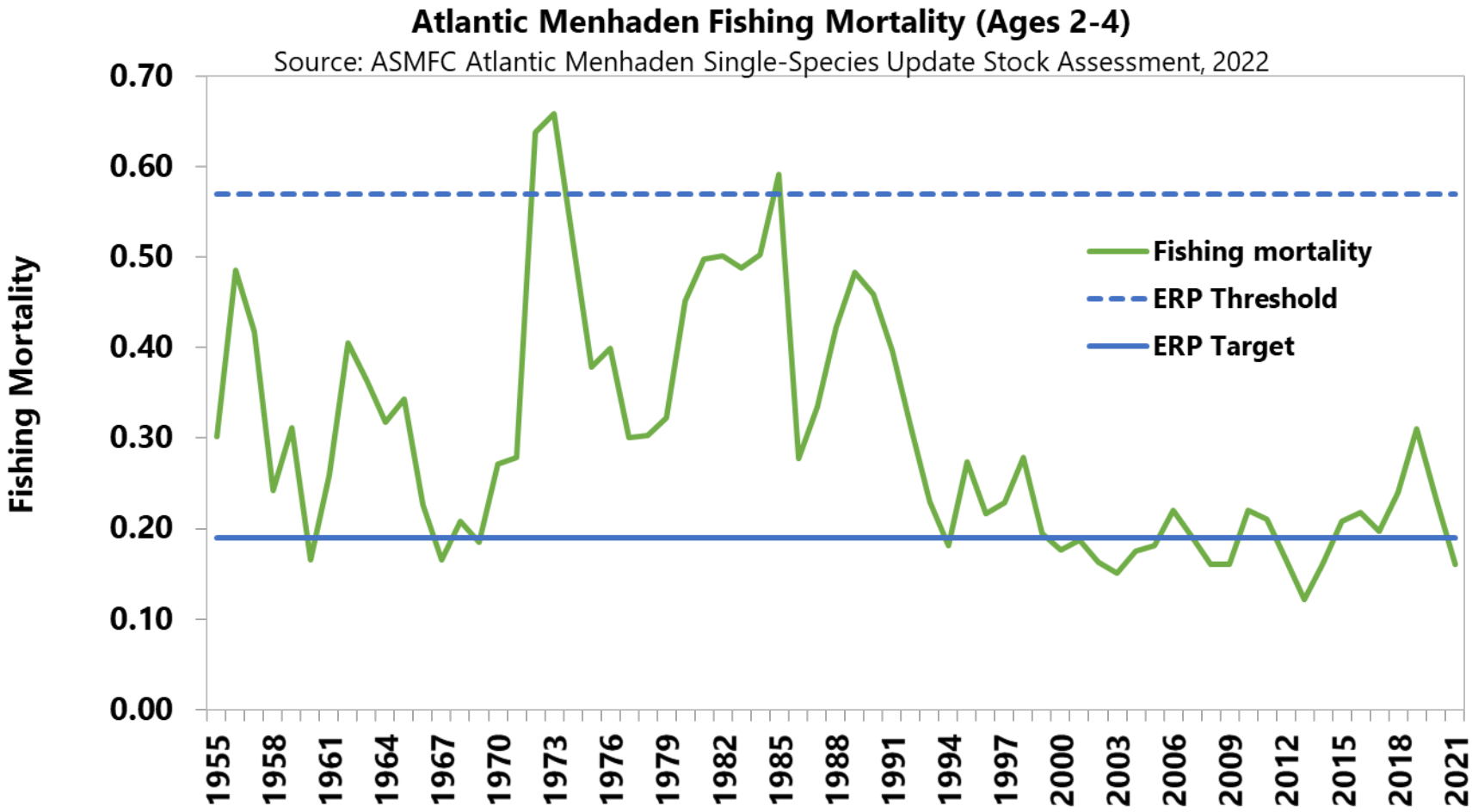


Figure 16. The full fishing mortality rate for 1955-2021 compared to the ecological reference point (ERP) threshold and target for fishing mortality rate. The full fishing mortality is dependent upon selectivity for the fisheries, and thus can represent ages-2 to 4, depending upon the year.

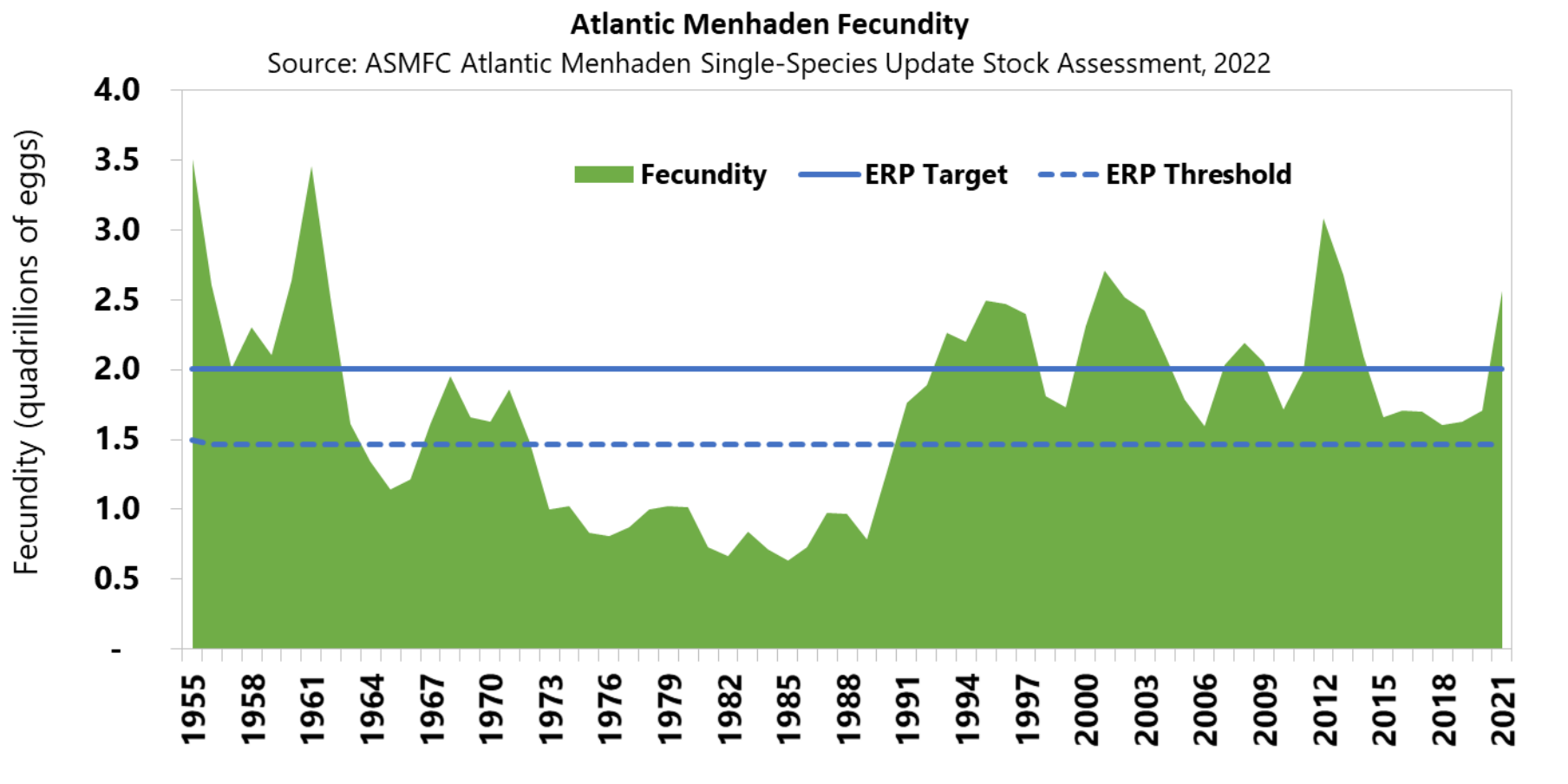


Figure 17. The fecundity for 1955-2021 compared to the ecological reference point (ERP) threshold and target for fecundity.

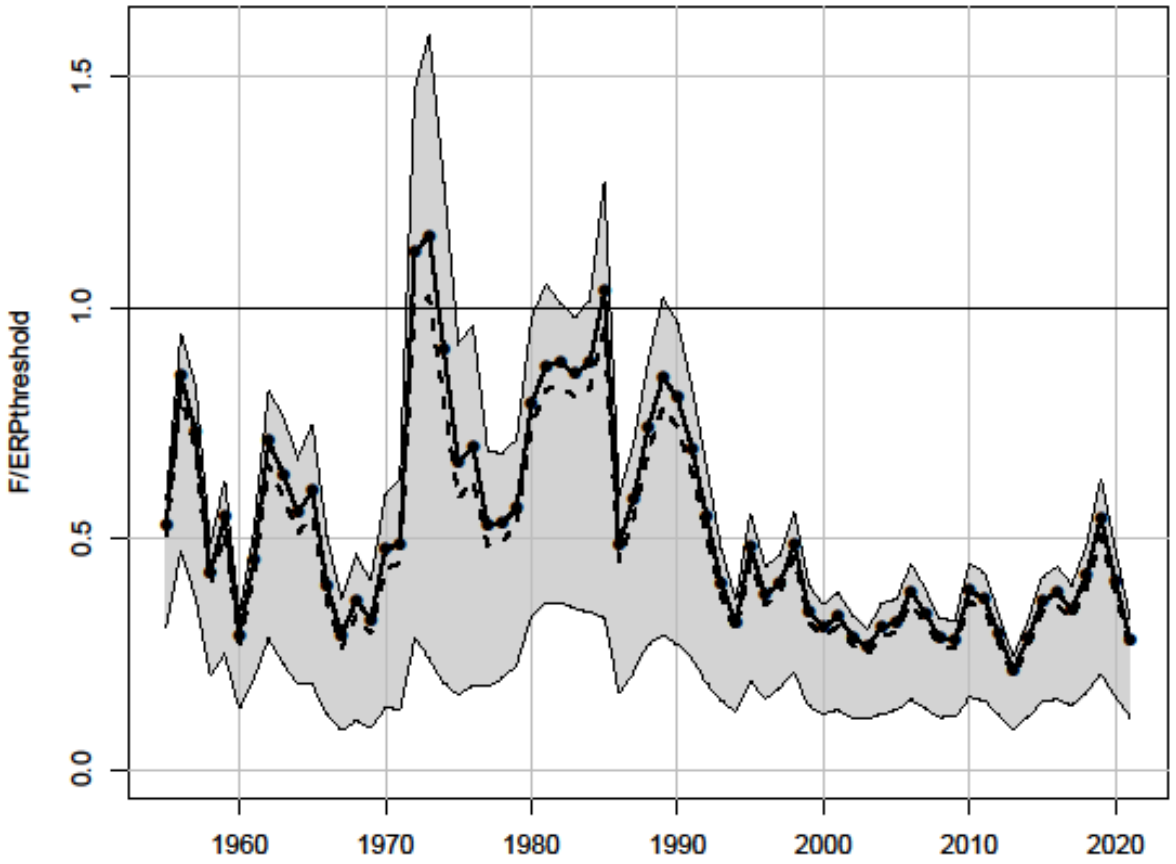


Figure 18. Fishing mortality rate from the MCB analysis over the ERP *F* threshold. The grey represents the 5th and 95th percentiles across the runs, while the black line with closed black circles represents the base run. The dashed line represents the median of the MCB run.

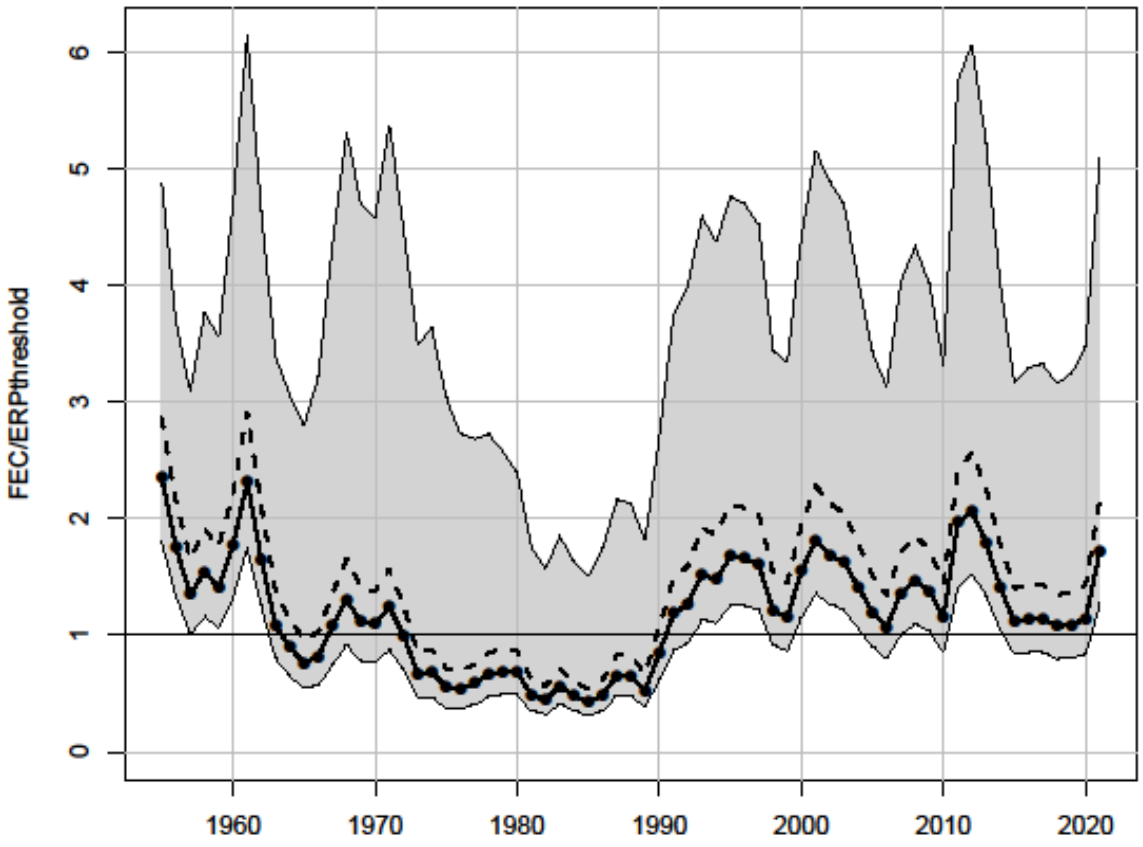


Figure 19. Fecundity from the MCB analysis over the ERP fecundity threshold. The grey represents the 5th and 95th percentiles across the runs, while the black line with closed black circles represents the base run. The dashed line represents the median of the MCB runs.

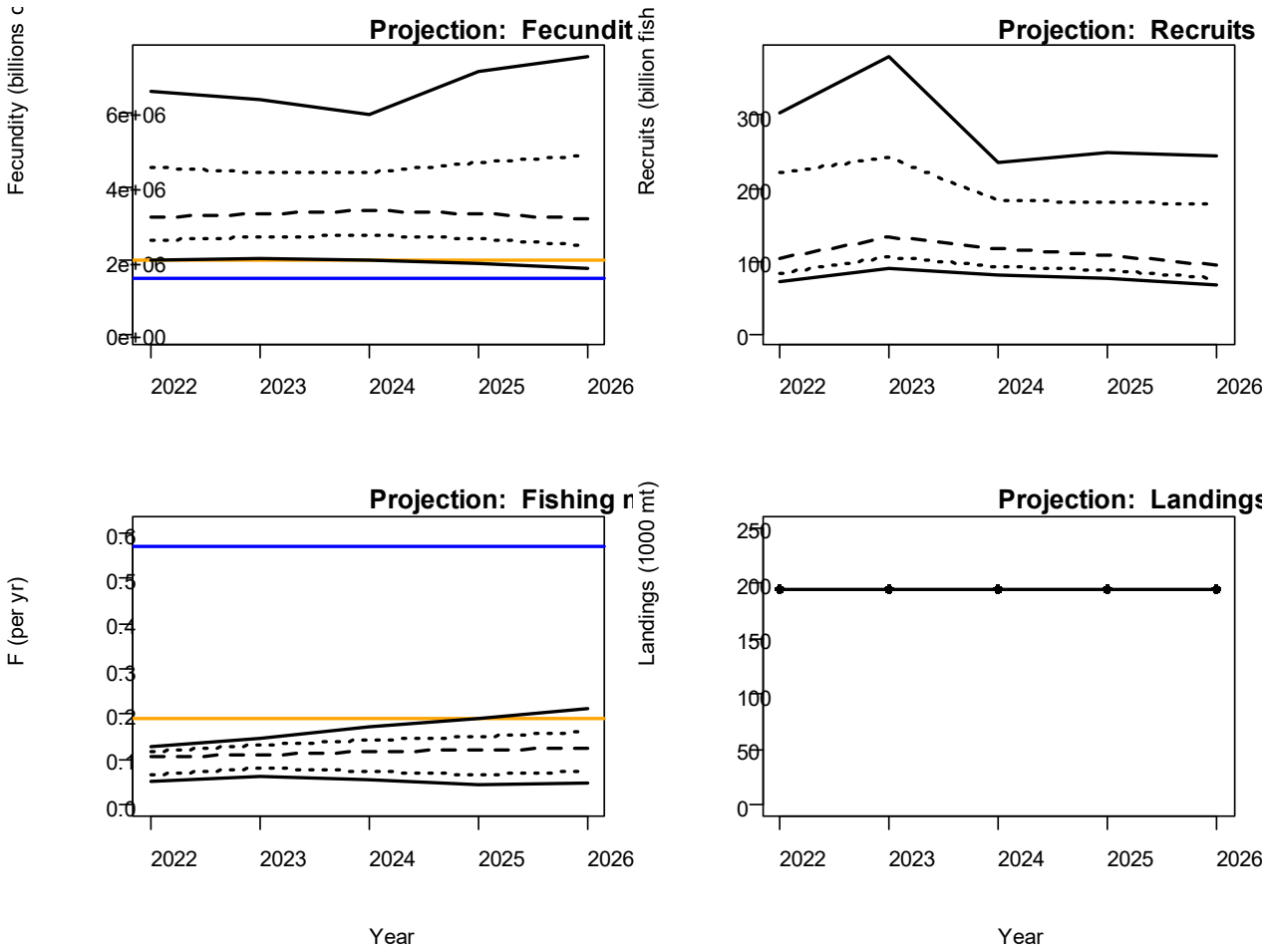


Figure 20. Fecundity, fishing mortality rate, and recruits projected from 2022 to 2026 for a coastwide total allowable catch of 194,400 mt. The orange lines represent the target fishing mortality rate and fecundity for the ecological reference points, while the blue lines represent the threshold fishing mortality rate and fecundity for the ecological reference points.

APPENDIX

Appendix Tables

Table A1. Atlantic menhaden landings (in 1,000s of metric tons) by fishery and region, 1955-2021.

Year	Reduction Landings			Bait Landings			Recreational Landings			Total Landings
	Total	North	South	Total	North	South	Total	North	South	
1955	644.48	402.74	241.74	14.64	10.14	4.50				659.12
1956	715.25	478.89	236.36	23.25	17.51	5.74				738.50
1957	605.58	389.80	215.78	24.71	10.60	14.11				630.29
1958	512.39	248.34	264.05	14.69	3.46	11.23				527.07
1959	662.17	318.44	343.73	20.58	7.98	12.61				682.76
1960	532.24	323.86	208.37	19.44	7.61	11.83				551.68
1961	578.61	334.76	243.85	25.07	8.44	16.63				603.68
1962	540.66	321.36	219.31	26.58	10.60	15.98				567.24
1963	348.44	147.55	200.89	24.39	6.11	18.28				372.83
1964	270.40	50.61	219.80	20.23	4.27	15.97				290.64
1965	274.60	57.96	216.64	23.62	3.30	20.32				298.22
1966	220.69	7.89	212.80	13.72	1.76	11.96				234.41
1967	194.39	17.21	177.18	11.61	1.44	10.17				206.00
1968	235.86	33.07	202.80	9.46	0.75	8.71				245.32
1969	162.33	15.41	146.92	10.61	1.11	9.50				172.94
1970	259.39	15.80	243.59	21.64	1.41	20.23				281.03
1971	250.32	33.44	216.87	13.47	1.87	11.60				263.79
1972	365.87	69.09	296.78	10.35	2.14	8.21				376.22
1973	346.92	90.69	256.23	14.77	2.61	12.16				361.69
1974	292.20	77.90	214.31	14.54	2.11	12.43				306.74
1975	250.21	48.40	201.81	21.69	1.89	19.80				271.90
1976	340.54	86.84	253.70	19.63	1.98	17.65				360.17
1977	341.16	53.31	287.85	23.09	1.39	21.70				364.25
1978	344.08	63.53	280.55	25.87	1.07	24.80				369.95
1979	375.74	70.19	305.55	13.02	1.17	11.85				388.76
1980	401.53	83.02	318.51	26.11	1.07	25.05				427.64
1981	381.31	68.06	313.25	22.44	1.08	21.36	0.42	0.25	0.17	404.17
1982	382.46	35.08	347.38	19.86	1.32	18.54	0.34	0.20	0.14	402.66
1983	418.63	39.37	379.26	19.06	1.36	17.71	0.68	0.14	0.54	438.38

Table A1. ***Continued***

Year	Reduction Landings			Bait Landings			Recreational Landings			Total Landings
	Total	North	South	Total	North	South	Total	North	South	
1984	326.30	34.97	291.33	14.33	1.59	12.75	0.42	0.15	0.27	341.05
1985	306.67	111.25	195.42	45.02	22.92	22.10	0.52	0.38	0.14	352.21
1986	237.99	42.57	195.42	35.47	18.30	17.17	1.04	0.93	0.10	274.49
1987	326.90	82.99	243.91	36.43	18.30	18.13	0.65	0.63	0.02	363.98
1988	309.29	73.64	235.65	53.14	21.43	31.70	1.15	0.54	0.61	363.58
1989	322.00	98.82	223.18	32.07	11.49	20.57	0.53	0.46	0.08	354.60
1990	401.15	144.10	257.05	31.04	16.21	14.84	0.52	0.36	0.16	432.72
1991	381.43	104.55	276.87	34.68	21.23	13.45	1.13	0.92	0.21	417.24
1992	297.64	99.14	198.50	38.61	25.13	13.48	2.30	2.12	0.19	338.55
1993	320.60	58.37	262.23	41.04	26.82	14.22	0.52	0.47	0.05	362.16
1994	259.99	33.39	226.60	35.35	18.81	16.54	0.39	0.19	0.20	295.73
1995	339.92	96.30	243.62	39.35	20.88	18.47	0.68	0.36	0.32	379.95
1996	292.93	61.55	231.38	36.19	17.34	18.85	0.51	0.11	0.40	329.62
1997	259.14	25.17	233.98	41.24	19.38	21.86	0.19	0.11	0.08	300.57
1998	245.91	12.33	233.58	39.64	16.83	22.81	0.43	0.34	0.08	285.98
1999	171.19	8.42	162.77	35.27	13.39	21.89	0.64	0.13	0.51	207.11
2000	167.26	43.19	124.08	33.91	15.11	18.79	0.27	0.23	0.04	201.43
2001	233.56	39.62	193.94	36.06	13.17	22.89	0.38	0.06	0.32	269.99
2002	174.07	27.17	146.89	37.04	13.00	24.04	0.86	0.64	0.22	211.96
2003	166.11	4.15	161.96	33.64	8.50	25.14	0.58	0.32	0.27	200.33
2004	178.47	25.91	152.55	34.44	10.19	24.25	2.45	2.12	0.32	215.35
2005	152.85	15.37	137.48	39.06	10.23	28.83	0.32	0.04	0.28	192.23
2006	157.36	60.15	97.21	27.89	12.38	15.52	1.52	0.89	0.63	186.77
2007	174.48	36.63	137.84	42.63	20.39	22.24	1.13	0.67	0.47	218.24
2008	141.14	39.30	101.84	47.87	26.43	21.44	0.92	0.79	0.13	189.93
2009	143.75	18.66	125.09	39.86	19.26	20.60	0.56	0.18	0.39	184.17
2010	183.10	28.67	154.43	42.97	25.80	17.17	0.74	0.39	0.35	226.81
2011	174.02	29.57	144.45	52.96	34.26	18.70	0.80	0.44	0.35	227.78
2012	160.62	23.91	136.71	63.89	39.99	23.90	1.98	0.80	1.18	226.48
2013	131.02	32.70	98.32	37.04	19.72	17.32	0.95	0.55	0.40	169.01
2014	131.10	29.90	101.20	41.06	20.56	20.50	2.10	1.73	0.37	174.26
2015	143.50	28.80	114.70	45.52	24.73	20.79	2.00	1.70	0.29	191.02
2016	137.40	45.00	92.40	43.94	25.78	18.16	6.90	6.21	0.69	188.25
2017	128.92	58.45	70.47	46.04	28.62	17.42	2.33	1.99	0.35	177.29
2018	141.31	57.72	83.59	50.08	33.45	16.63	2.01	1.77	0.25	193.41
2019	150.82	45.78	105.05	57.88	39.05	18.83	1.15	1.04	0.11	209.86
2020	124.60	52.55	72.05	59.66	42.35	17.31	1.71	1.51	0.20	185.98
2021	136.69	59.62	77.07	59.00	41.17	17.83	1.95	1.80	0.16	197.65

Table A2. Catch-at-age for the northern commercial reduction fishery from 1955-2021.

Year	0	1	2	3	4	5	6+	# of fish sampled
1955	0	0.015	0.471	0.217	0.253	0.032	0.012	8408
1956	0	0.133	0.555	0.195	0.025	0.072	0.020	11050
1957	0	0.270	0.610	0.051	0.033	0.017	0.020	11247
1958	0	0.025	0.908	0.042	0.010	0.008	0.009	8777
1959	0	0.531	0.291	0.159	0.009	0.004	0.007	10470
1960	0	0.009	0.892	0.037	0.049	0.009	0.004	9346
1961	0	0.003	0.160	0.803	0.012	0.018	0.003	8059
1962	0	0.015	0.245	0.218	0.457	0.033	0.032	9598
1963	0	0.296	0.438	0.095	0.068	0.080	0.023	6058
1964	0	0.034	0.357	0.345	0.128	0.065	0.072	4619
1965	0	0.160	0.370	0.373	0.071	0.013	0.014	6564
1966	0	0.201	0.467	0.212	0.100	0.009	0.012	1859
1967	0	0.055	0.296	0.567	0.072	0.009	0.000	1840
1968	0	0.007	0.479	0.388	0.116	0.009	0.001	5701
1969	0	0.001	0.251	0.594	0.149	0.005	0	3621
1970	0	0.150	0.793	0.050	0.007	0	0	700
1971	0	0.126	0.288	0.433	0.137	0.017	0	760
1972	0	0.169	0.286	0.452	0.085	0.008	0	759
1973	0	0.021	0.821	0.133	0.024	0.001	0	729
1974	0	0.028	0.844	0.117	0.006	0.004	0	1280
1975	0	0	0.798	0.175	0.025	0.001	0	1850
1976	0	0.092	0.823	0.071	0.013	0	0	2010
1977	0	0.022	0.567	0.326	0.079	0.006	0.001	2200
1978	0	0	0.298	0.567	0.120	0.015	0	1861
1979	0	0.007	0.579	0.332	0.076	0.006	0	1688
1980	0	0.002	0.237	0.462	0.243	0.051	0.004	1744
1981	0	0.001	0.357	0.357	0.210	0.070	0.006	2220
1982	0	0.042	0.393	0.473	0.063	0.025	0.004	840
1983	0	0.012	0.826	0.120	0.037	0.005	0	840
1984	0	0.024	0.343	0.506	0.097	0.029	0.001	3110
1985	0	0.020	0.760	0.089	0.111	0.017	0.003	1490
1986	0	0.010	0.795	0.107	0.050	0.031	0.006	530
1987	0	0.005	0.652	0.277	0.058	0.006	0.002	940
1988	0	0	0.225	0.486	0.260	0.026	0.003	1650
1989	0	0.081	0.623	0.173	0.097	0.025	0	1360

Table A2. ***Continued***

Year	0	1	2	3	4	5	6+	# of fish sampled
1990	0	0.011	0.788	0.134	0.049	0.018	0.001	1660
1991	0	0.085	0.430	0.385	0.072	0.023	0.005	1460
1992	0	0.058	0.687	0.107	0.118	0.026	0.004	1180
1993	0	0.045	0.675	0.226	0.036	0.017	0.002	640
1994	0	0.017	0.420	0.333	0.183	0.047	0	300
1995	0	0.020	0.567	0.329	0.079	0.006	0	710
1996	0	0	0.579	0.320	0.092	0.008	0	500
1997	0	0	0.495	0.293	0.158	0.055	0	130
1998	0	0	0.657	0.281	0.062	0	0	100
1999	0	0	0.389	0.428	0.168	0.015	0	120
2000	0	0.005	0.559	0.406	0.019	0.011	0	490
2001	0	0	0.150	0.796	0.055	0	0	380
2002	0	0.040	0.347	0.491	0.120	0.002	0	290
2003	0	0	0.474	0.378	0.139	0.010	0	90
2004	0	0.004	0.615	0.320	0.061	0	0	290
2005	0	0	0.219	0.605	0.174	0.002	0	240
2006	0	0.022	0.456	0.422	0.099	0.001	0	1040
2007	0	0.022	0.761	0.174	0.041	0.002	0	520
2008	0	0.002	0.216	0.668	0.106	0.008	0	550
2009	0	0.123	0.299	0.463	0.102	0.013	0	240
2010	0	0	0.456	0.348	0.193	0.003	0	380
2011	0	0.058	0.726	0.190	0.023	0.003	0	410
2012	0	0.001	0.778	0.192	0.029	0	0	330
2013	0	0.028	0.724	0.233	0.015	0	0	370
2014	0	0.085	0.518	0.274	0.119	0.004	0	290
2015	0	0.006	0.593	0.362	0.038	0	0	390
2016	0	0.075	0.413	0.481	0.031	0	0	700
2017	0	0.017	0.572	0.393	0.015	0.003	0	1070
2018	0	0.088	0.680	0.211	0.021	0	0	590
2019	0.002	0.503	0.407	0.081	0.008	0	0	650
2020								0
2021	0	0.106	0.849	0.045	0	0	0	80

Table A3. Catch-at-age for the southern commercial reduction fishery from 1955-2021.

Year	0	1	2	3	4	5	6+	# of fish sampled
1955	0.374	0.323	0.269	0.016	0.016	0.002	0	7742
1956	0.017	0.885	0.049	0.018	0.004	0.022	0.004	8831
1957	0.151	0.598	0.217	0.010	0.011	0.007	0.006	8467
1958	0.059	0.466	0.443	0.018	0.005	0.005	0.004	7008
1959	0.003	0.855	0.099	0.034	0.005	0.002	0.002	7490
1960	0.052	0.192	0.701	0.018	0.025	0.008	0.004	4167
1961	0	0.538	0.217	0.234	0.004	0.007	0	5158
1962	0.040	0.387	0.491	0.033	0.044	0.003	0.002	6197
1963	0.079	0.460	0.386	0.059	0.007	0.008	0.002	6977
1964	0.187	0.433	0.349	0.028	0.002	0	0	5824
1965	0.184	0.528	0.269	0.018	0.001	0	0	13017
1966	0.265	0.414	0.299	0.020	0.001	0	0	13848
1967	0.007	0.663	0.269	0.057	0.003	0	0	13648
1968	0.143	0.349	0.468	0.037	0.003	0	0	21168
1969	0.188	0.442	0.330	0.038	0.002	0	0	11511
1970	0.016	0.650	0.309	0.022	0.003	0	0	7761
1971	0.083	0.288	0.569	0.054	0.005	0.001	0	7510
1972	0.033	0.618	0.285	0.061	0.003	0	0	5800
1973	0.036	0.372	0.591	0.001	0	0	0	5640
1974	0.196	0.388	0.413	0.003	0	0	0	4330
1975	0.154	0.371	0.469	0.006	0.001	0	0	5450
1976	0.101	0.572	0.324	0.003	0	0	0	4720
1977	0.140	0.289	0.567	0.003	0	0	0	5080
1978	0.158	0.230	0.558	0.050	0.003	0	0	5250
1979	0.413	0.172	0.403	0.012	0.001	0	0	4680
1980	0.028	0.476	0.452	0.038	0.004	0.001	0	5548
1981	0.316	0.186	0.460	0.038	0	0	0	7000
1982	0.038	0.306	0.558	0.096	0.001	0	0	8230
1983	0.279	0.148	0.547	0.016	0.008	0.001	0	4340
1984	0.396	0.311	0.244	0.040	0.007	0.002	0	8580
1985	0.235	0.394	0.364	0.006	0	0	0	6230
1986	0.056	0.126	0.797	0.019	0.002	0.001	0	4880
1987	0.022	0.253	0.691	0.031	0.003	0	0	6460
1988	0.175	0.146	0.573	0.099	0.006	0.001	0	5708
1989	0.069	0.514	0.402	0.014	0.001	0	0	5530

Table A3. ***Continued***

Year	0	1	2	3	4	5	6+	# of fish sampled
1990	0.190	0.078	0.697	0.023	0.010	0.002	0	5180
1991	0.317	0.360	0.281	0.038	0.004	0.001	0	6230
1992	0.243	0.428	0.313	0.014	0.002	0	0	4430
1993	0.049	0.266	0.608	0.074	0.003	0	0	4680
1994	0.064	0.197	0.609	0.094	0.035	0.002	0	4410
1995	0.044	0.408	0.366	0.150	0.031	0.002	0	3900
1996	0.036	0.226	0.630	0.092	0.015	0.001	0	3720
1997	0.027	0.260	0.423	0.236	0.047	0.007	0.001	3970
1998	0.073	0.187	0.535	0.123	0.073	0.009	0.001	3740
1999	0.188	0.292	0.428	0.069	0.020	0.003	0	3500
2000	0.140	0.205	0.510	0.127	0.016	0.002	0	2550
2001	0.039	0.073	0.604	0.265	0.018	0.001	0	3540
2002	0.242	0.284	0.321	0.140	0.012	0	0	3310
2003	0.088	0.185	0.643	0.073	0.010	0.001	0	3400
2004	0.020	0.234	0.670	0.060	0.015	0.001	0	3880
2005	0.020	0.131	0.618	0.210	0.018	0.003	0	3290
2006	0.016	0.525	0.378	0.072	0.008	0	0	2530
2007	0.001	0.306	0.631	0.054	0.008	0	0	3270
2008	0.017	0.115	0.812	0.053	0.003	0	0	2220
2009	0.007	0.515	0.311	0.147	0.019	0.001	0	2590
2010	0.017	0.447	0.494	0.034	0.008	0	0	2890
2011	0	0.477	0.467	0.048	0.007	0.002	0	2820
2012	0.007	0.183	0.789	0.020	0.001	0	0	2300
2013	0.043	0.457	0.388	0.095	0.016	0	0	1760
2014	0.007	0.482	0.377	0.106	0.026	0.002	0	1790
2015	0	0.141	0.759	0.092	0.009	0	0	2170
2016	0.022	0.303	0.509	0.160	0.006	0	0	1800
2017	0	0.249	0.581	0.144	0.026	0	0	1280
2018	0.036	0.334	0.479	0.136	0.015	0	0	1520
2019	0.002	0.755	0.202	0.037	0.004	0.001	0	1620
2020	0.0	0.177	0.819	0.003	0	0	0	450
2021	0.0	0.831	0.167	0.002	0.001	0	0	660

Table A4. Catch-at-age for the northern commercial bait fishery (includes MRIP estimate of recreational catch).

Year	0	1	2	3	4	5	6+	# of fish sampled
1985	0	0.010	0.754	0.116	0.093	0.022	0.006	0
1986	0	0.001	0.207	0.563	0.116	0.091	0.023	0
1987	0	0.002	0.215	0.531	0.226	0.016	0.010	0
1988	0	0	0.070	0.521	0.363	0.041	0.004	0
1989	0	0.010	0.216	0.374	0.310	0.089	0.001	30
1990	0	0.003	0.536	0.261	0.143	0.053	0.005	0
1991	0	0.014	0.247	0.543	0.136	0.048	0.011	0
1992	0	0.027	0.359	0.210	0.312	0.074	0.018	0
1993	0	0.008	0.327	0.494	0.099	0.065	0.008	29
1994	0	0	0.111	0.495	0.341	0.050	0.003	401
1995	0	0	0.092	0.471	0.437	0.001	0	190
1996	0	0	0.413	0.442	0.137	0.008	0	203
1997	0	0	0.145	0.324	0.395	0.118	0.018	111
1998	0	0	0.104	0.379	0.420	0.084	0.013	225
1999	0	0	0.147	0.476	0.322	0.044	0.011	201
2000	0	0.004	0.416	0.314	0.229	0.030	0.007	266
2001	0	0	0.112	0.735	0.135	0.014	0.004	678
2002	0	0	0.054	0.553	0.335	0.058	0	524
2003	0	0	0.128	0.663	0.199	0.010	0	101
2004	0	0.007	0.438	0.381	0.161	0.013	0	29
2005	0	0.002	0.188	0.626	0.162	0.022	0	0
2006	0	0.004	0.279	0.566	0.147	0.001	0.004	259
2007	0	0	0.384	0.482	0.125	0.008	0.002	729
2008	0	0	0.262	0.585	0.139	0.013	0	973
2009	0	0	0.204	0.608	0.175	0.013	0	435
2010	0	0	0.365	0.380	0.227	0.025	0.002	466
2011	0	0	0.142	0.486	0.327	0.045	0	449
2012	0	0	0.392	0.468	0.130	0.008	0.002	547
2013	0	0	0.257	0.555	0.159	0.029	0	236
2014	0	0	0.066	0.525	0.387	0.020	0.002	806
2015	0	0.002	0.377	0.522	0.099	0	0	1291
2016	0	0.020	0.390	0.529	0.054	0.007	0	1018
2017	0	0.017	0.565	0.380	0.036	0.001	0	1487
2018	0	0.000	0.272	0.595	0.123	0.010	0	331
2019	0	0.038	0.357	0.445	0.142	0.015	0.004	837
2020	0	0.007	0.688	0.251	0.045	0.007	0.002	754
2021	0	0.030	0.651	0.234	0.082	0.004	0	234

Table A5. Catch-at-age for the southern commercial bait fishery (includes MRIP estimate of recreational catch).

Year	0	1	2	3	4	5	6	# of fish sampled
1985	0.004	0.313	0.659	0.016	0.006	0.002	0	800
1986	0.001	0.064	0.860	0.066	0.006	0.003	0.001	420
1987	0.001	0.089	0.836	0.068	0.006	0.000	0	220
1988	0.004	0.060	0.663	0.232	0.038	0.003	0	10
1989	0.004	0.341	0.577	0.063	0.013	0.003	0	0
1990	0.005	0.061	0.903	0.026	0.003	0.001	0	10
1991	0.012	0.301	0.595	0.084	0.005	0.001	0	78
1992	0.000	0.554	0.446	0.000	0	0	0	70
1993	0.008	0.357	0.530	0.097	0.006	0.003	0	121
1994	0.001	0.142	0.650	0.150	0.052	0.005	0	139
1995	0	0.392	0.374	0.217	0.017	0	0	174
1996	0	0.006	0.757	0.199	0.037	0	0	156
1997	0	0.055	0.531	0.346	0.056	0.008	0.004	293
1998	0.036	0.065	0.539	0.237	0.108	0.012	0.003	411
1999	0	0.105	0.663	0.174	0.052	0.006	0	338
2000	0.008	0.222	0.659	0.112	0	0	0	270
2001	0.004	0.043	0.658	0.275	0.017	0.004	0	286
2002	0	0.047	0.265	0.494	0.173	0.020	0.002	180
2003	0.007	0.095	0.740	0.142	0.015	0	0	328
2004	0	0.066	0.733	0.167	0.031	0.003	0	327
2005	0	0.008	0.515	0.447	0.027	0.003	0	316
2006	0	0.327	0.451	0.197	0.024	0	0	220
2007	0	0.243	0.671	0.067	0.019	0	0	434
2008	0.005	0.044	0.809	0.112	0.017	0.013	0	366
2009	0.004	0.241	0.367	0.341	0.047	0	0	573
2010	0.003	0.306	0.527	0.102	0.059	0.002	0	435
2011	0	0.338	0.470	0.121	0.051	0.020	0	508
2012	0	0.068	0.825	0.085	0.017	0.002	0.002	408
2013	0.007	0.449	0.289	0.173	0.054	0.027	0	434
2014	0	0.437	0.365	0.138	0.055	0.005	0	559
2015	0.010	0.309	0.589	0.089	0.002	0	0	251
2016	0	0.225	0.423	0.324	0.021	0.007	0	205
2017	0	0.267	0.496	0.229	0.008	0	0	137
2018	0	0.328	0.446	0.166	0.060	0.001	0	280
2019	0	0.580	0.250	0.125	0.039	0.003	0.003	684
2020	0	0.004	0.023	0.973	0	0	0	65
2021	0	0.689	0.307	0.003	0.001	0.001	0	101

Table A6. Young-of-year abundance index (YOY), northern adult index (NAD), Mid-Atlantic adult index (MAD), and southern adult index (SAD) of abundance for Atlantic menhaden developed from the Conn method with associated coefficients of variation (CV).

Year	YOY		NAD		MAD		SAD	
	Index	CV	Index	CV	Index	CV	Index	CV
1959	1.40	1.05						
1960	0.39	1.04						
1961	0.34	1.05						
1962	1.46	1.00						
1963	1.07	1.05						
1964	0.74	1.09						
1965	0.41	1.05						
1966	0.54	1.03						
1967	0.42	1.04						
1968	0.43	0.92						
1969	1.10	0.88						
1970	0.26	0.91						
1971	1.33	0.87						
1972	2.87	0.75						
1973	2.10	0.93						
1974	3.90	0.83						
1975	3.09	0.82						
1976	3.72	0.81						
1977	2.43	0.82						
1978	1.26	0.83						
1979	2.96	0.82						
1980	4.12	0.73						
1981	3.15	0.82						
1982	2.44	0.73						
1983	1.41	0.84						
1984	1.56	0.83						
1985	2.72	0.74			1.82	1.14		
1986	1.50	0.69			1.80	1.15		
1987	0.50	0.68			1.99	1.16		
1988	1.27	0.64			1.89	1.11		
1989	1.09	0.55			1.23	1.15		

Table A6. ***Continued***

Year	YOY		NAD		MAD		SAD	
	Index	CV	Index	CV	Index	CV	Index	CV
1990	0.64	0.49	0.60	0.70	0.96	1.16	4.45	0.66
1991	0.76	0.48	0.36	0.68	0.78	1.17	1.38	0.68
1992	0.43	0.48	1.12	0.49	1.35	1.19	0.87	0.68
1993	0.19	0.54	0.87	0.50	0.56	1.22	0.55	0.72
1994	0.21	0.50	0.48	0.55	1.45	1.11	0.35	0.79
1995	0.26	0.52	1.15	0.60	1.39	1.13	0.18	0.86
1996	0.22	0.52	0.59	0.65	0.60	1.19	0.26	0.79
1997	0.27	0.50	0.34	0.69	0.60	1.18	0.22	0.82
1998	0.36	0.48	0.81	0.54	0.79	0.36	0.91	0.70
1999	0.30	0.49	0.78	0.55	0.60	0.39	0.26	0.79
2000	0.48	0.47	0.69	0.75	0.82	0.39	0.72	0.80
2001	0.26	0.45	1.18	0.56	0.95	0.35	0.76	0.75
2002	0.44	0.43	1.59	0.60	0.46	0.39	0.88	0.69
2003	0.66	0.43	0.40	0.74	1.08	0.33	0.94	0.61
2004	0.57	0.42	0.47	0.72	0.53	0.35	0.46	0.55
2005	0.60	0.41	0.94	0.61	1.33	0.37	1.45	0.52
2006	0.25	0.42	1.18	0.49	0.45	0.37	2.84	0.48
2007	0.38	0.43	1.36	0.60	0.88	0.38	0.42	0.56
2008	0.27	0.42	1.26	0.50	0.40	0.40	0.58	0.41
2009	0.20	0.42	0.37	0.62	0.91	0.37	1.90	0.54
2010	0.41	0.43	0.68	0.64	0.99	0.36	0.75	0.40
2011	0.28	0.42	0.75	0.68	0.66	0.34	1.25	0.42
2012	0.12	0.44	2.02	0.52	0.59	0.39	1.19	0.42
2013	0.15	0.42	0.65	0.68	0.92	0.36	0.97	0.39
2014	0.30	0.42	1.36	0.52	1.61	0.34	0.94	0.42
2015	0.25	0.43	1.35	0.60	1.91	0.40	1.20	0.42
2016	0.49	0.43	1.09	0.60	0.57	0.39	0.41	0.47
2017	0.11	0.44	0.66	0.67	0.44	0.38	1.15	0.45
2018	0.29	0.44	0.56	0.79	1.21	0.61	0.86	0.46
2019	0.25	0.47	1.89	0.48	1.01	0.41	0.76	0.41
2020	0.22	0.48	2.39	0.58	0.33	0.42	0.96	0.71
2021	0.36	0.46	2.07	0.73	1.13	0.45	1.16	0.71

Table A7. List of surveys used in the Conn indices and their associated sigma (σ^p) values, or the standard deviation of the process error. Benchmark and update values are provided for comparison.

	Survey	2019 Benchmark	2022 Update
Age 1+ Surveys	CT Long Island Sound Trawl	0.96	1.90
	DE Adult Trawl	0.88	0.44
	NJ Ocean Trawl	1.53	1.15
	MD Striped Bass Spring Gill Net	2.23	2.22
	VIMS Shad and River Herring Monitoring	0.24	0.21
	NC Program 915 Pamlico Sound Gill Net	0.92	0.71
	SEAMAP	0.40	0.52
	GA Ecological Monitoring Trawl	0.50	0.73
YOY Surveys	RI Coastal Trawl	2.96	2.94
	CT River Juvenile Alosine Seine	2.50	2.52
	CT Thames River Seine	3.16	3.16
	CT Long Island Sound Trawl	1.34	1.28
	NY Peconic Bay Small Mesh Trawl	3.78	3.58
	NY Western Long Island Seine	2.99	3.10
	NY Juvenile Striped Bass Beach Seine	1.18	2.09
	NJ Ocean Trawl	1.85	1.89
	NJ Delaware River Striped Bass Seine	1.81	1.81
	DE Inland Bays	11.34	4.93
	MD Coastal Bays Trawl	2.17	1.33
	MD Juvenile Striped Bass Seine	1.64	1.44
	VIMS Juvenile Fish and Blue Crab Trawl	1.31	1.22
	VIMS Juvenile Striped Bass Seine	3.05	1.50
	NC Program 120 Estuarine Trawl	0.82	1.00
	SC Electrofishing	0.92	0.97

Appendix Figures

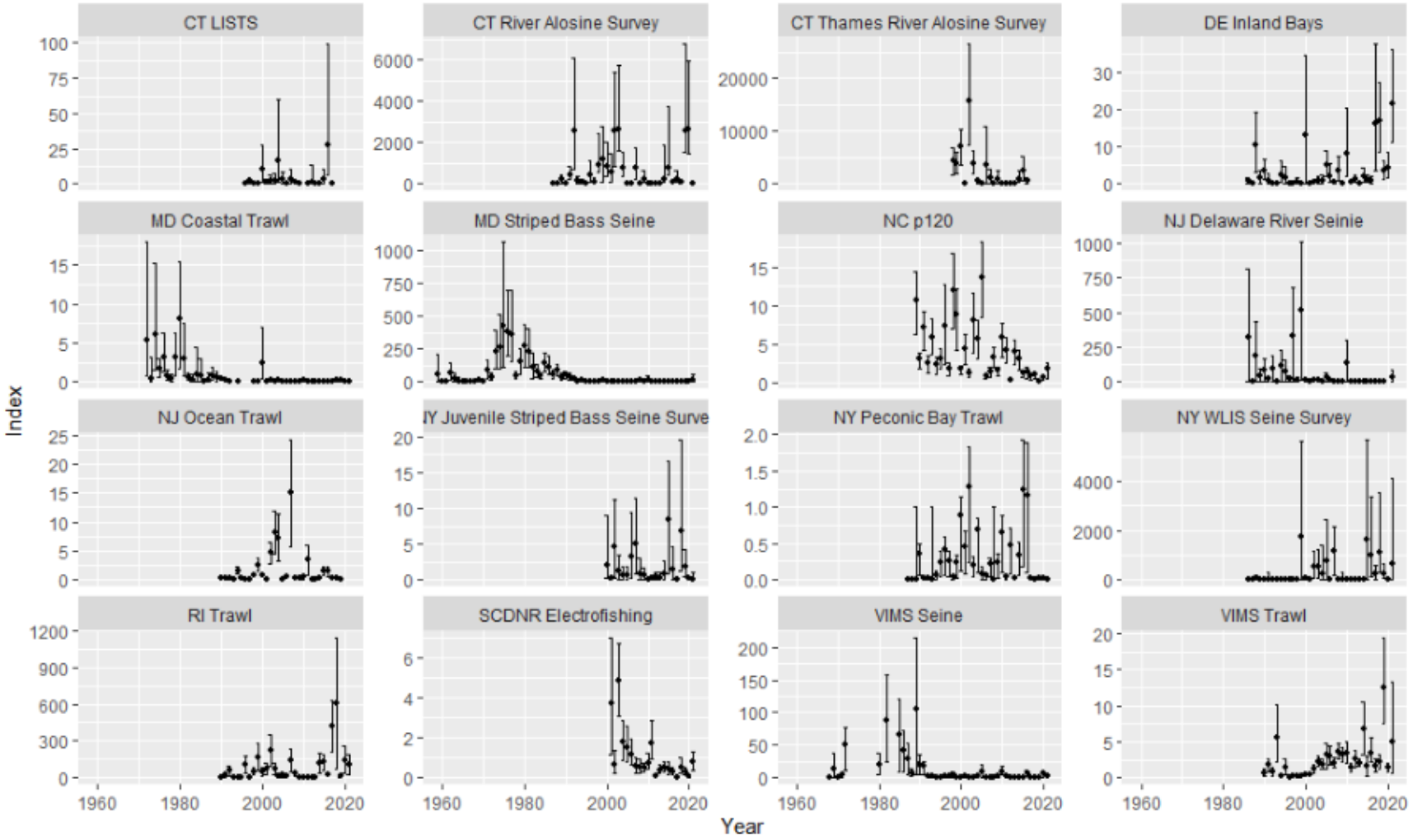


Figure A1. Individual YOY indices with 95% confidence intervals used in the coastwide YOY index.

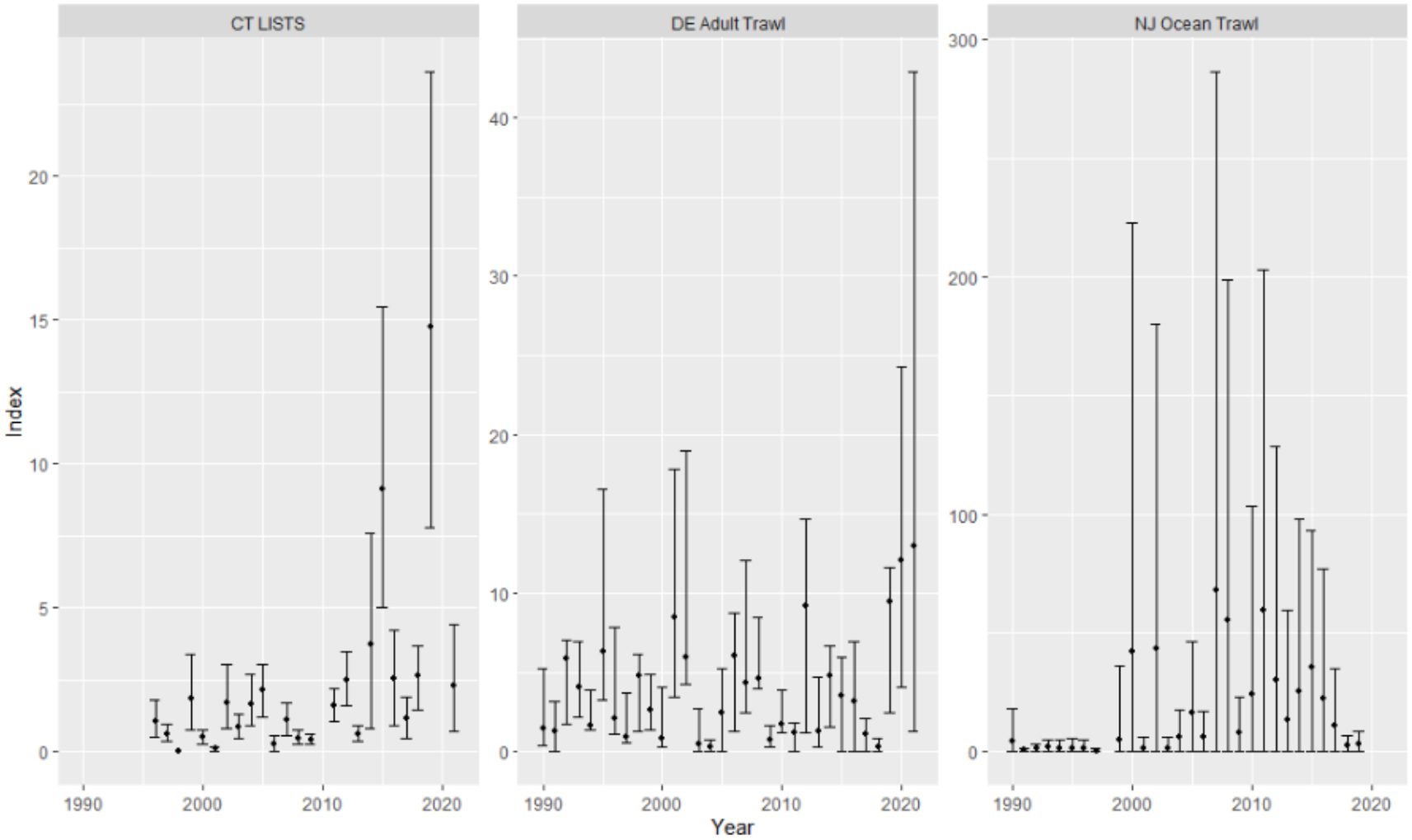


Figure A2. Individual adult indices with 95% confidence intervals used in the NAD index.

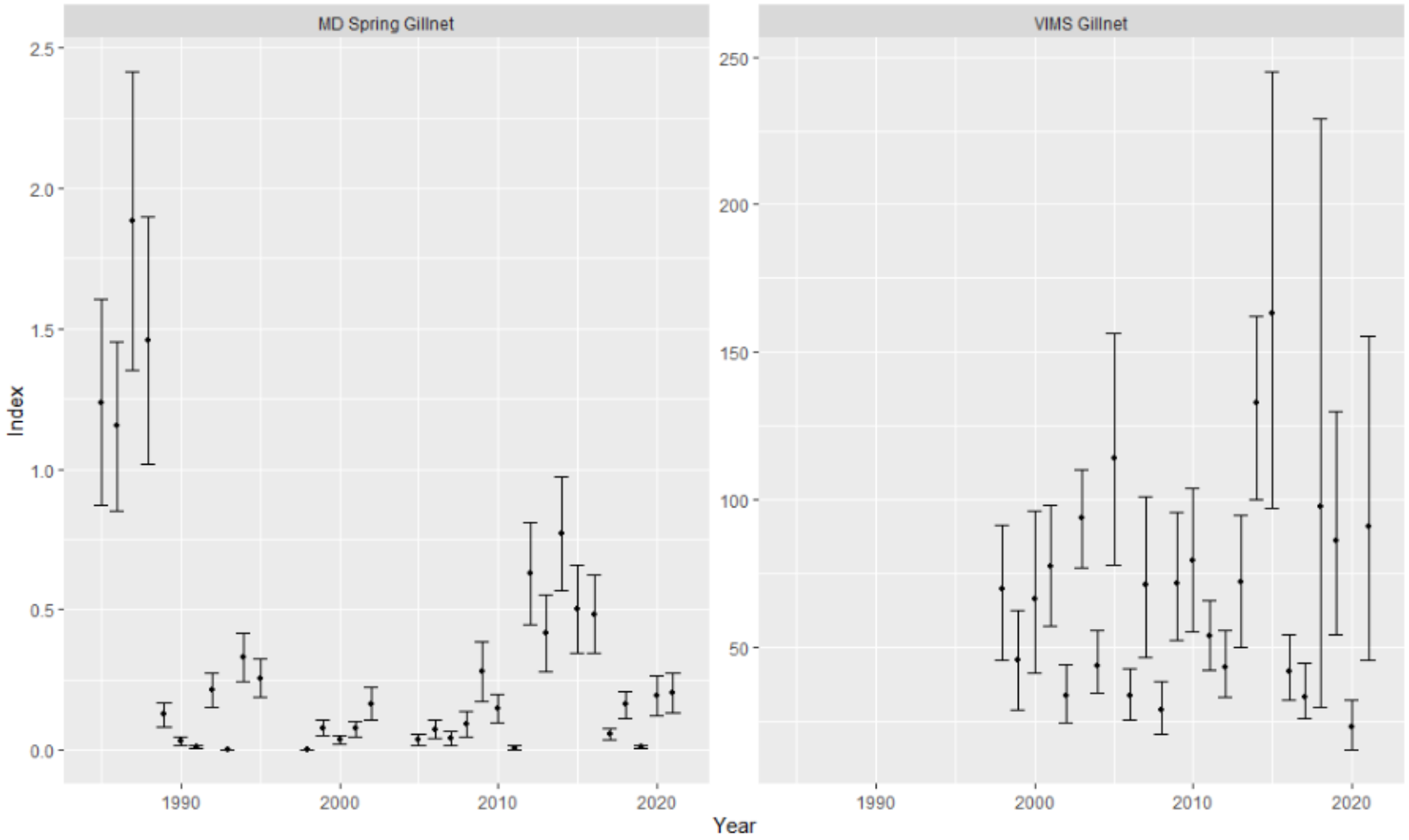


Figure A3. Individual adult indices with 95% confidence intervals used in the MAD index.

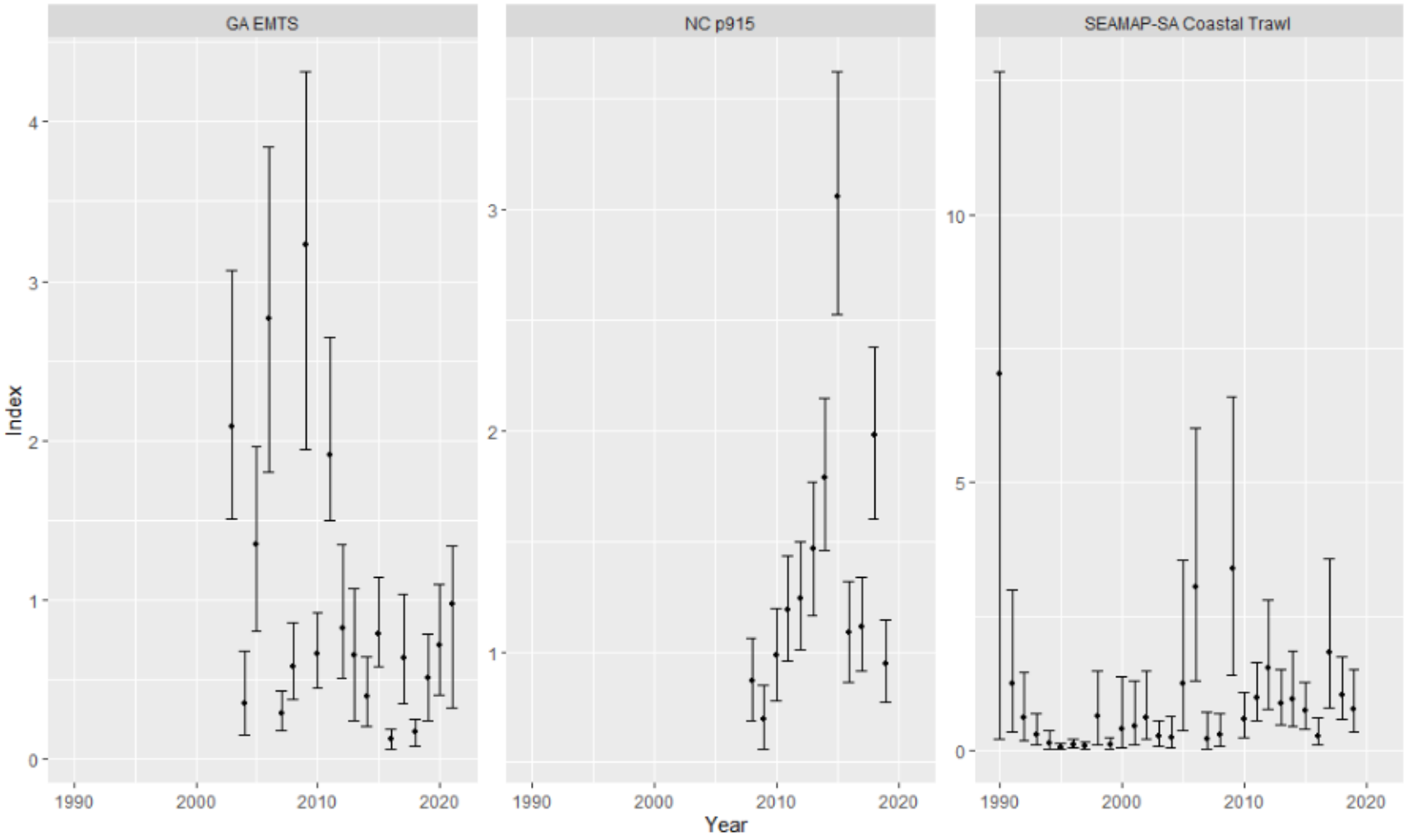


Figure A4. Individual adult indices with 95% confidence intervals used in the SAD index

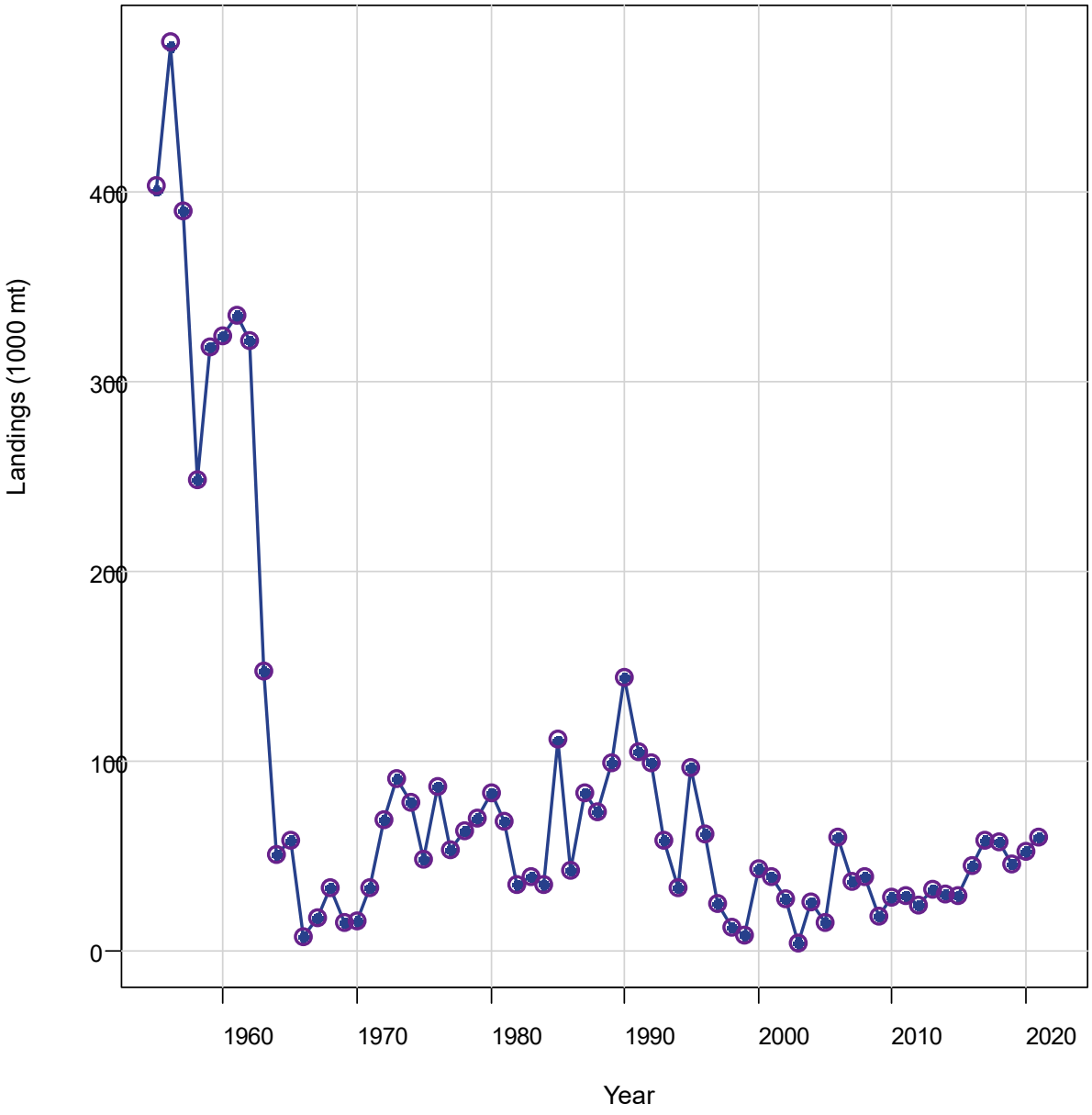


Figure A5. Predicted fit to the observed landings for the commercial reduction north fleet for 1955-2021.

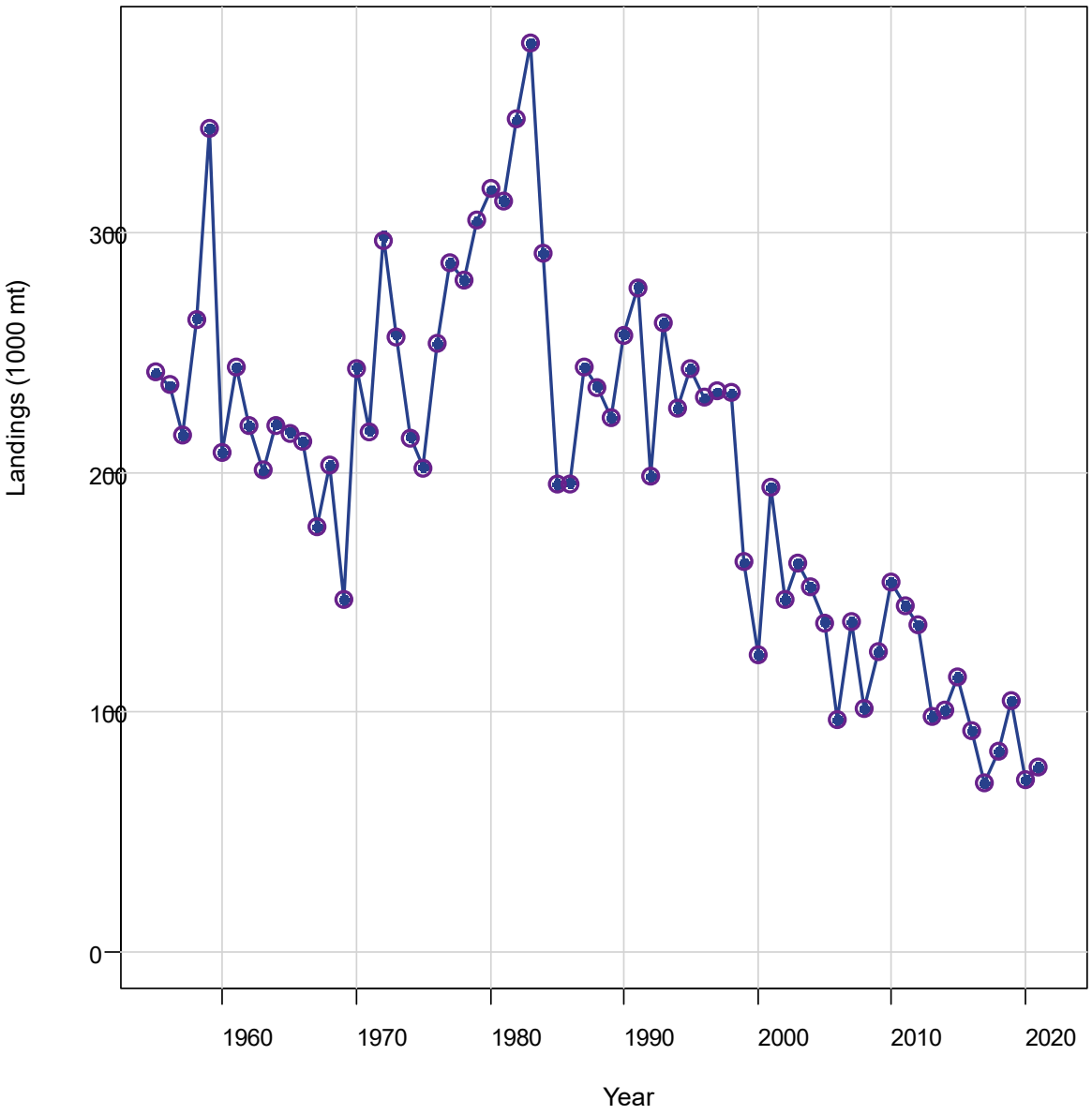


Figure A6. Predicted fit to the observed landings for the commercial reduction south fleet for 1955-2021.

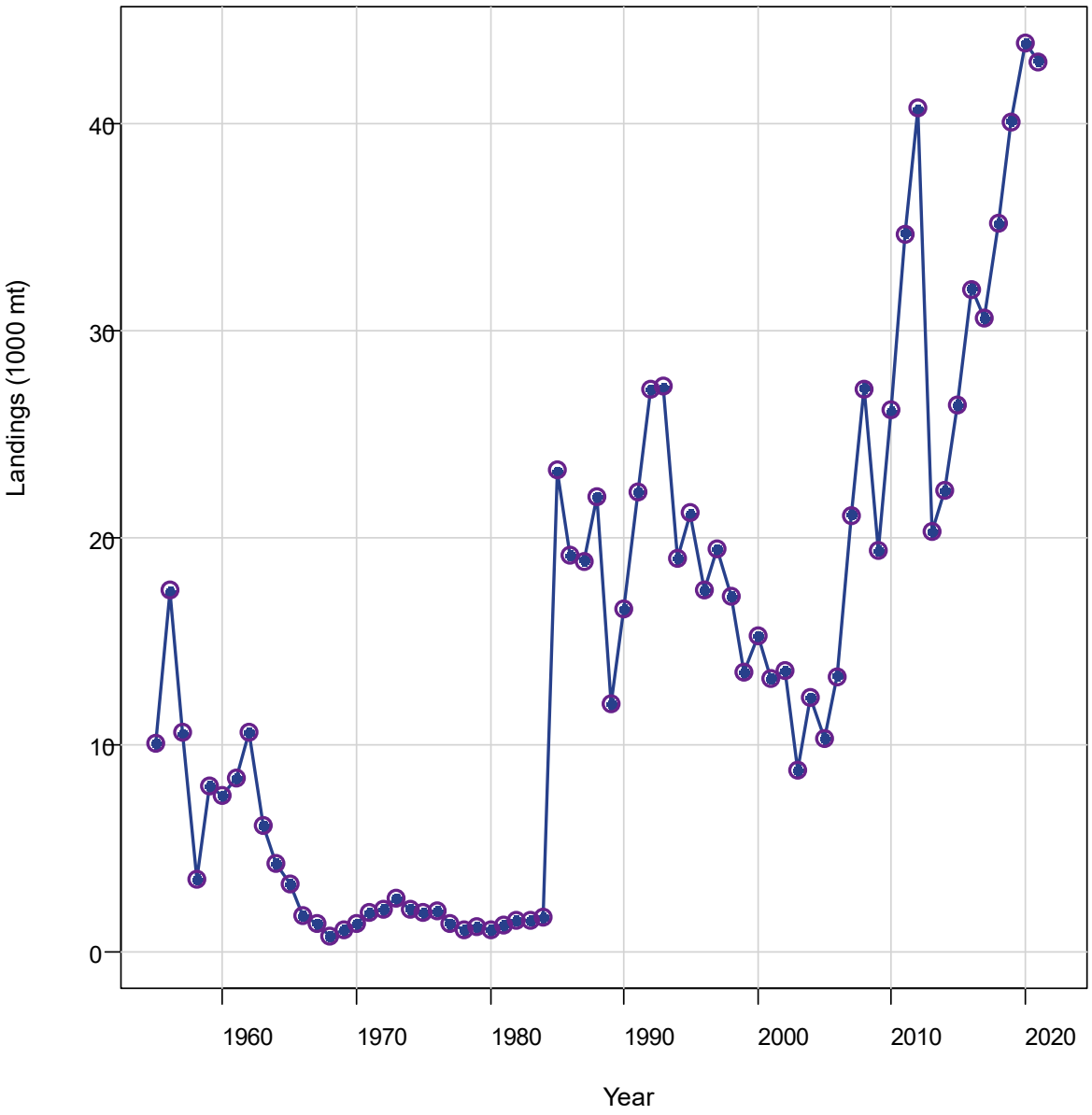


Figure A7. Predicted fit to the observed landings for the commercial bait north fleet for 1955-2021.

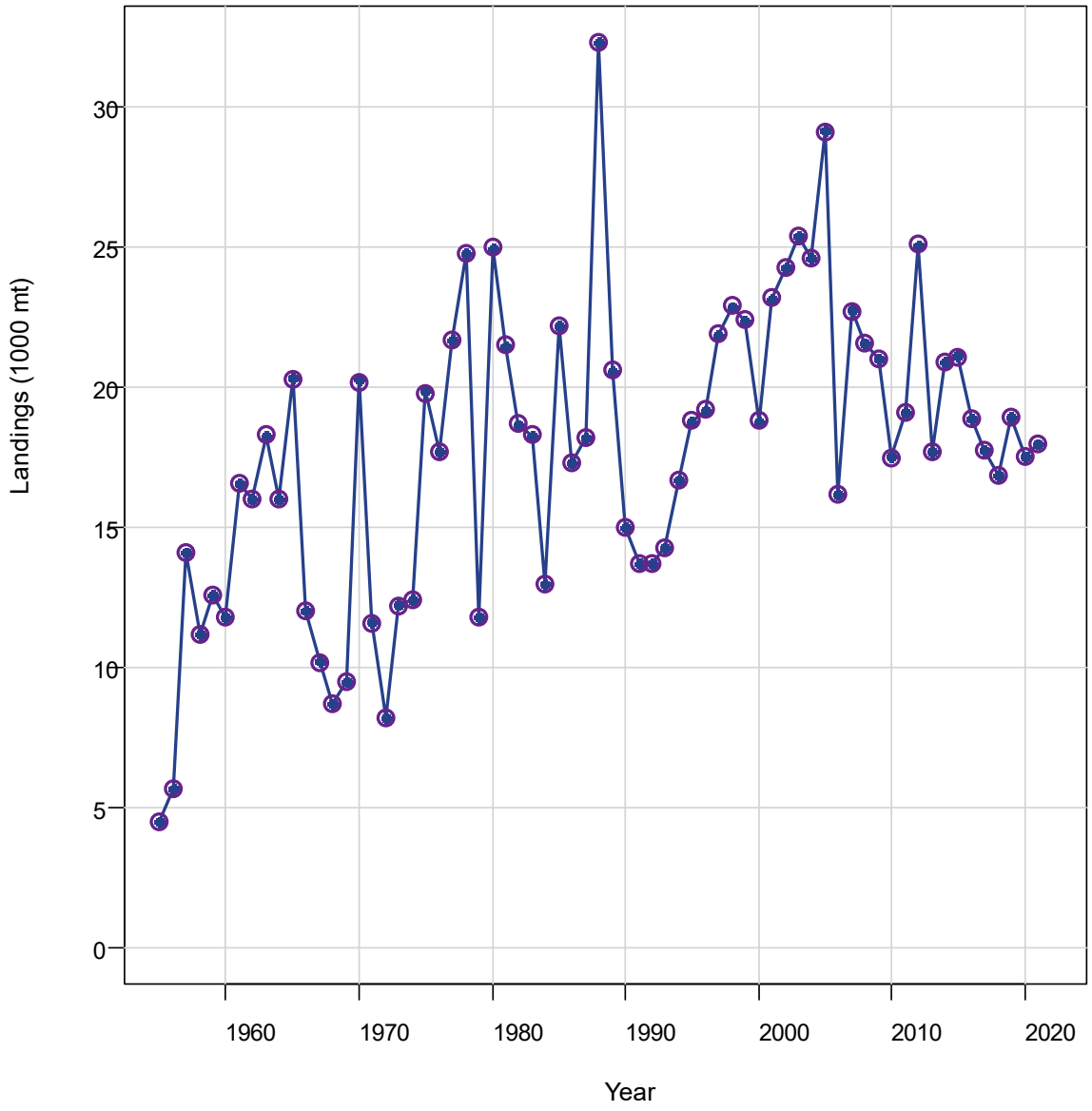


Figure A8. Predicted fit to the observed landings for the commercial bait south fleet for 1955-2021.

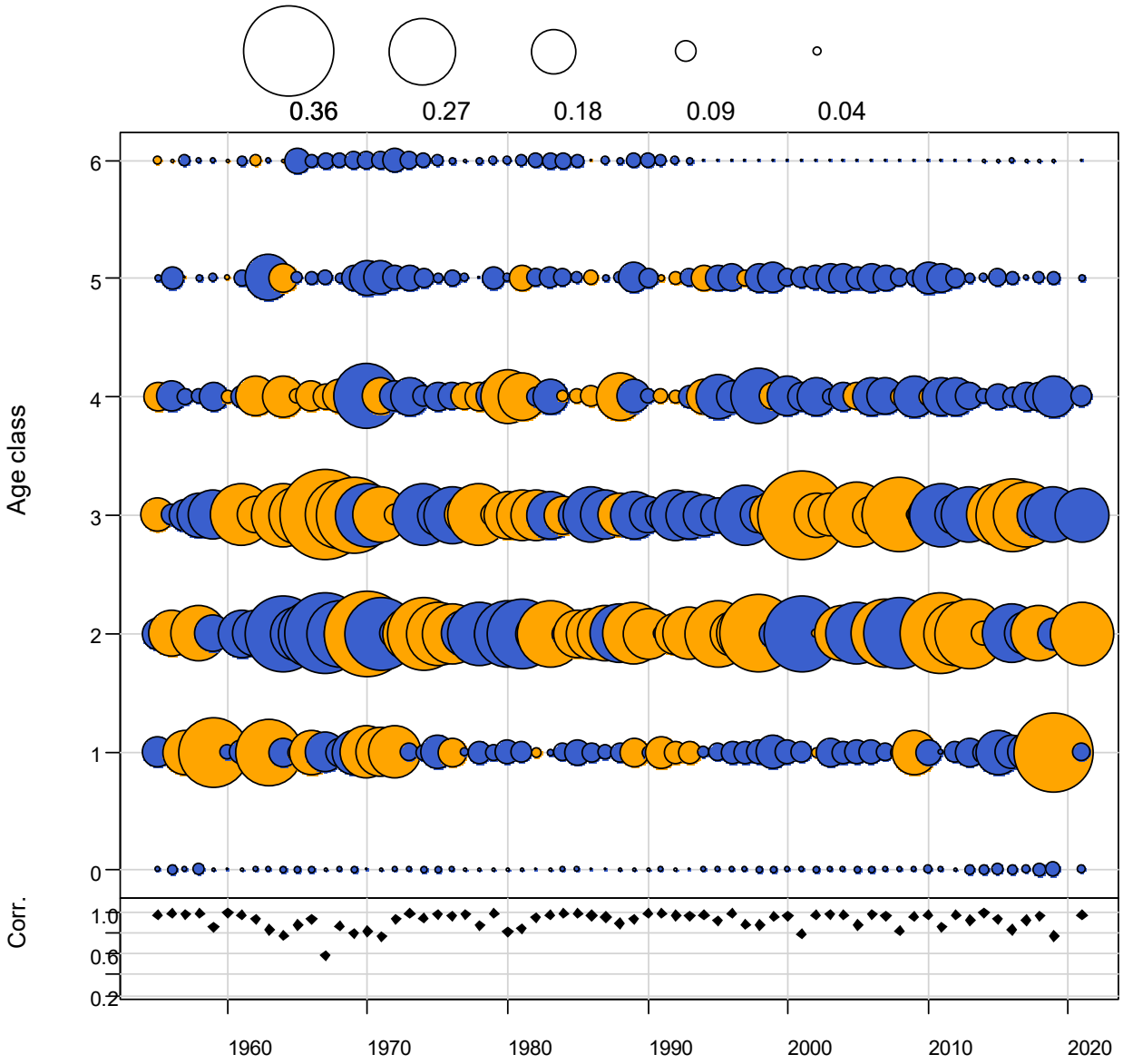


Figure A9. Bubble plot of the fits to the age compositions for the commercial reduction north fleet. Orange indicates an underestimate, while blue indicates on overestimate. The bottom panel indicates the correlation between the observed data and the model prediction.

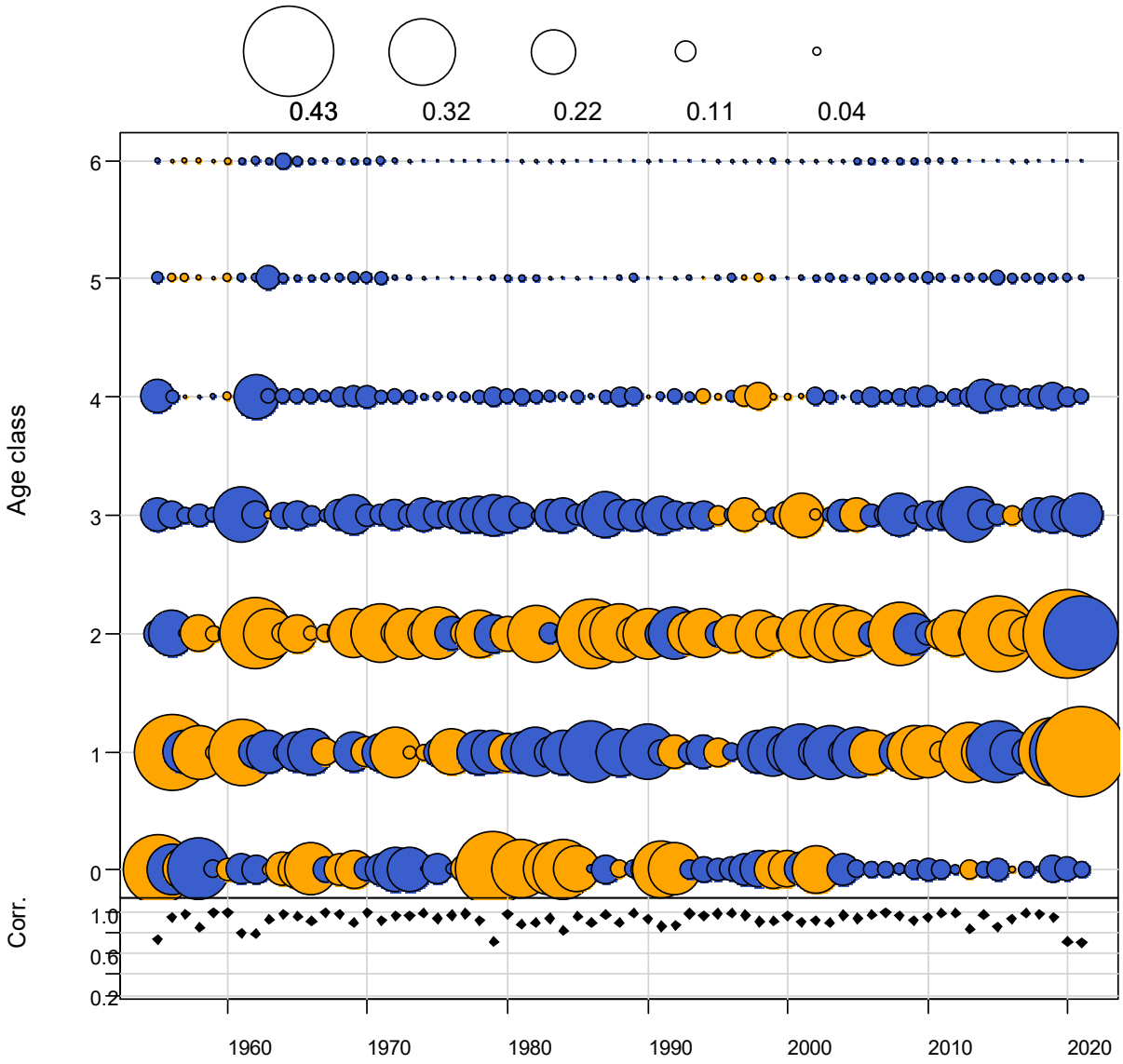


Figure A10. **Bubble plot of the fits to the age compositions for the commercial reduction south fleet. Orange indicates an underestimate, while blue indicates on overestimate. The bottom panel indicates the correlation between the observed data and the model prediction.**

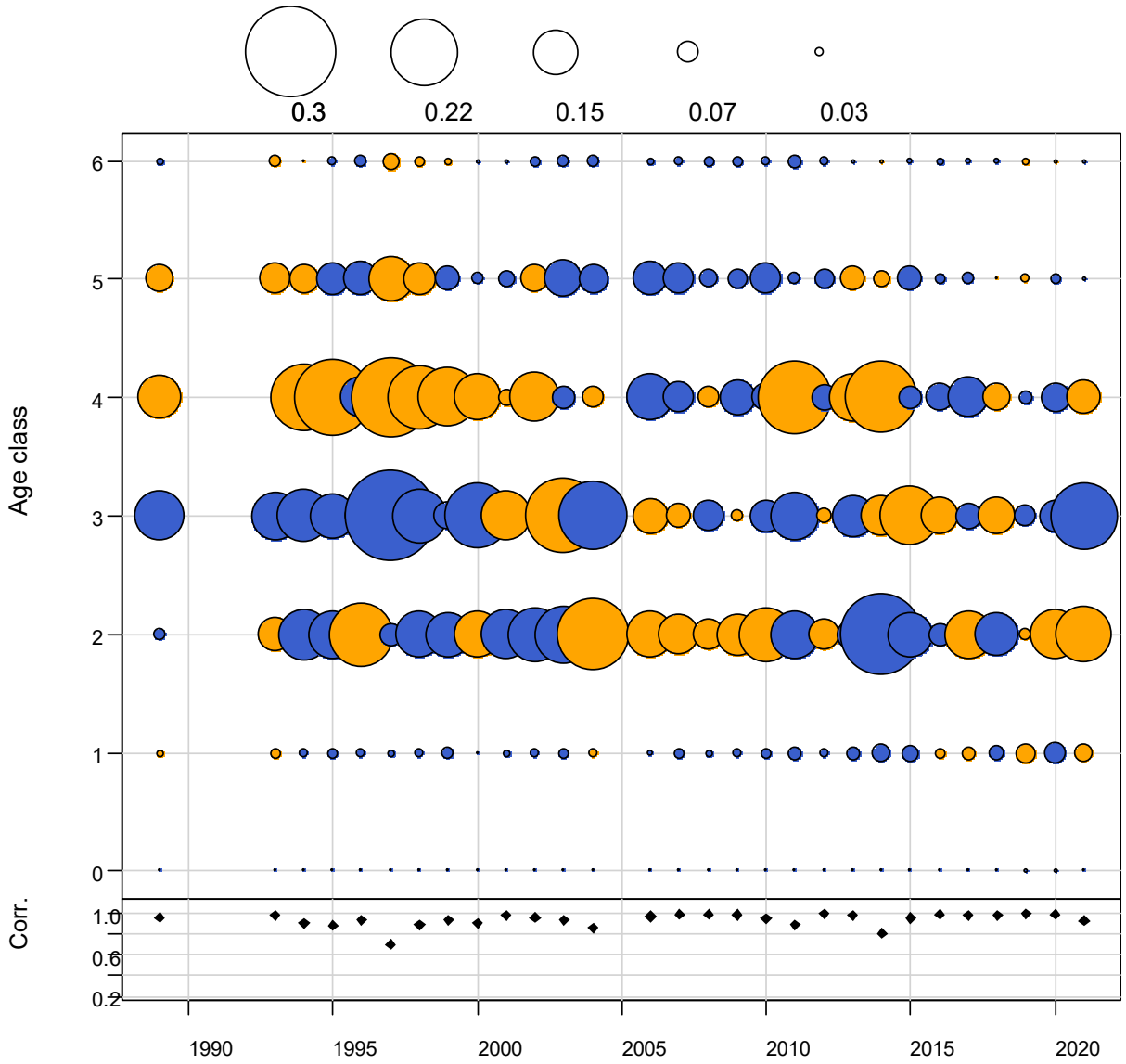


Figure A11. **Bubble plot of the fits to the age compositions for the commercial bait north fleet. Orange indicates an underestimate, while blue indicates on overestimate. The bottom panel indicates the correlation between the observed data and the model prediction.**

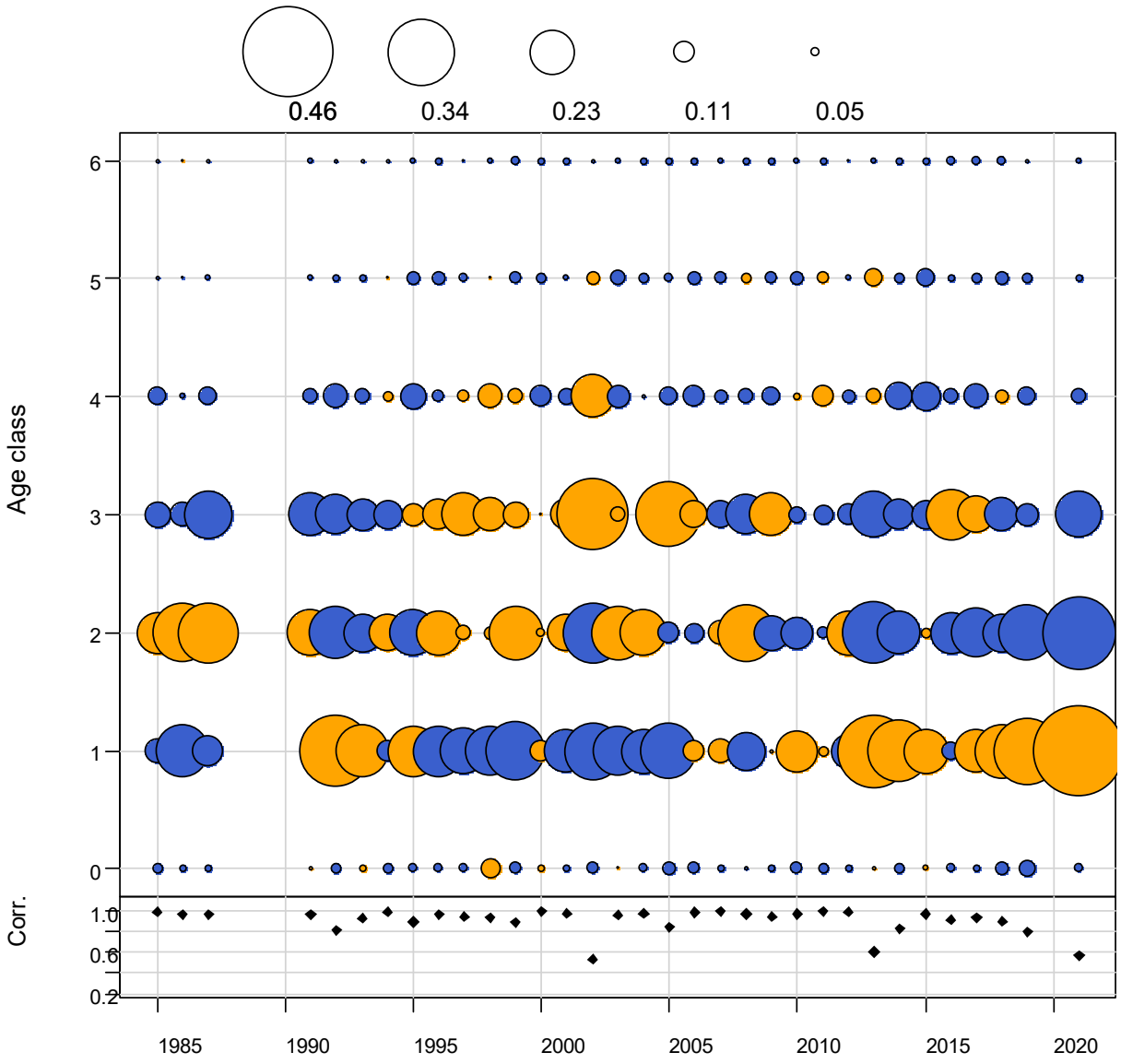


Figure A12. **Bubble plot of the fits to the age compositions for the commercial bait south fleet. Orange indicates an underestimate, while blue indicates on overestimate. The bottom panel indicates the correlation between the observed data and the model prediction.**

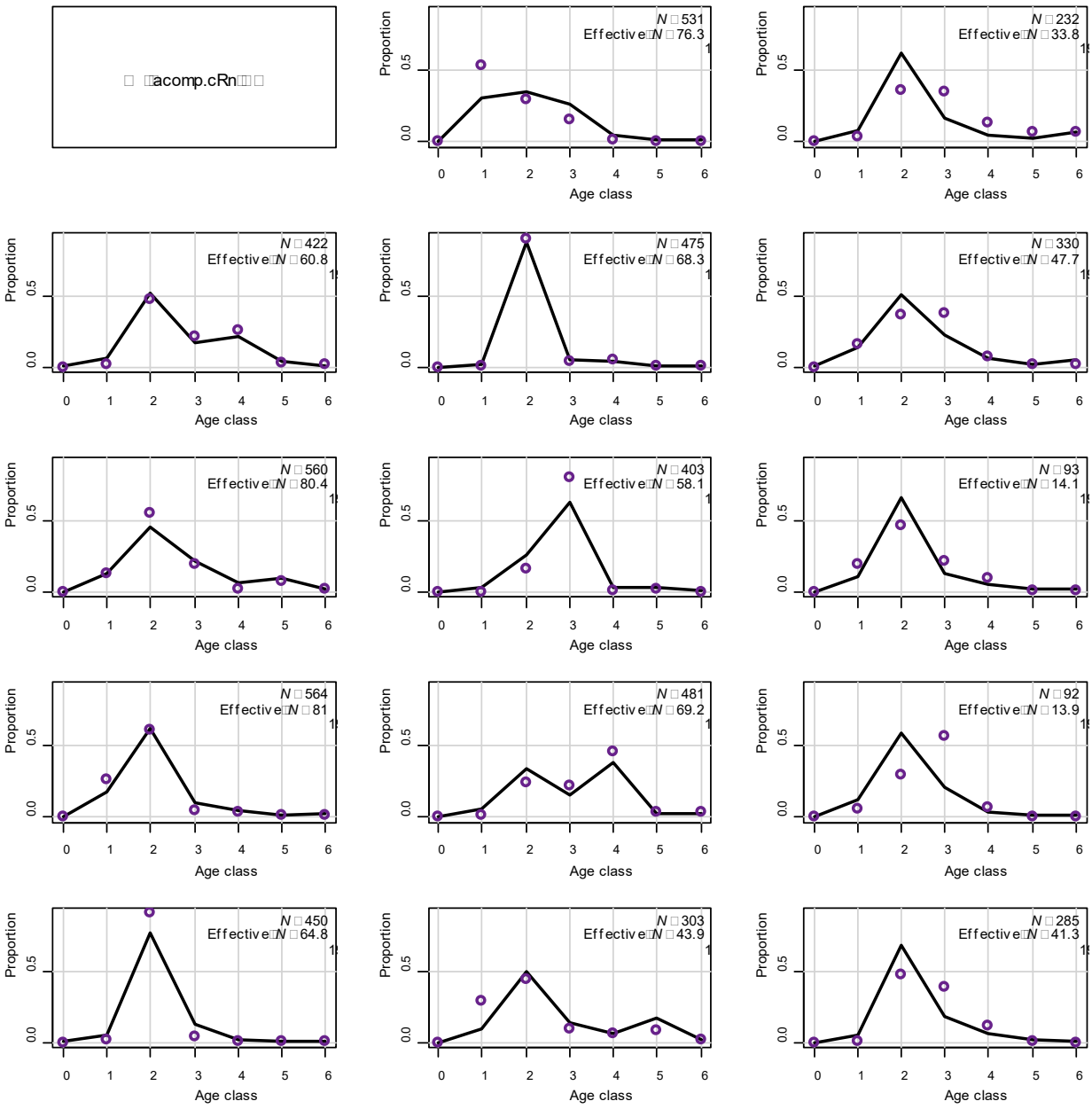


Figure A13. Annual age composition plots for the commercial reduction north fleet for 1955-2021. Open circles are the observed data, while the line indicates the model fit.

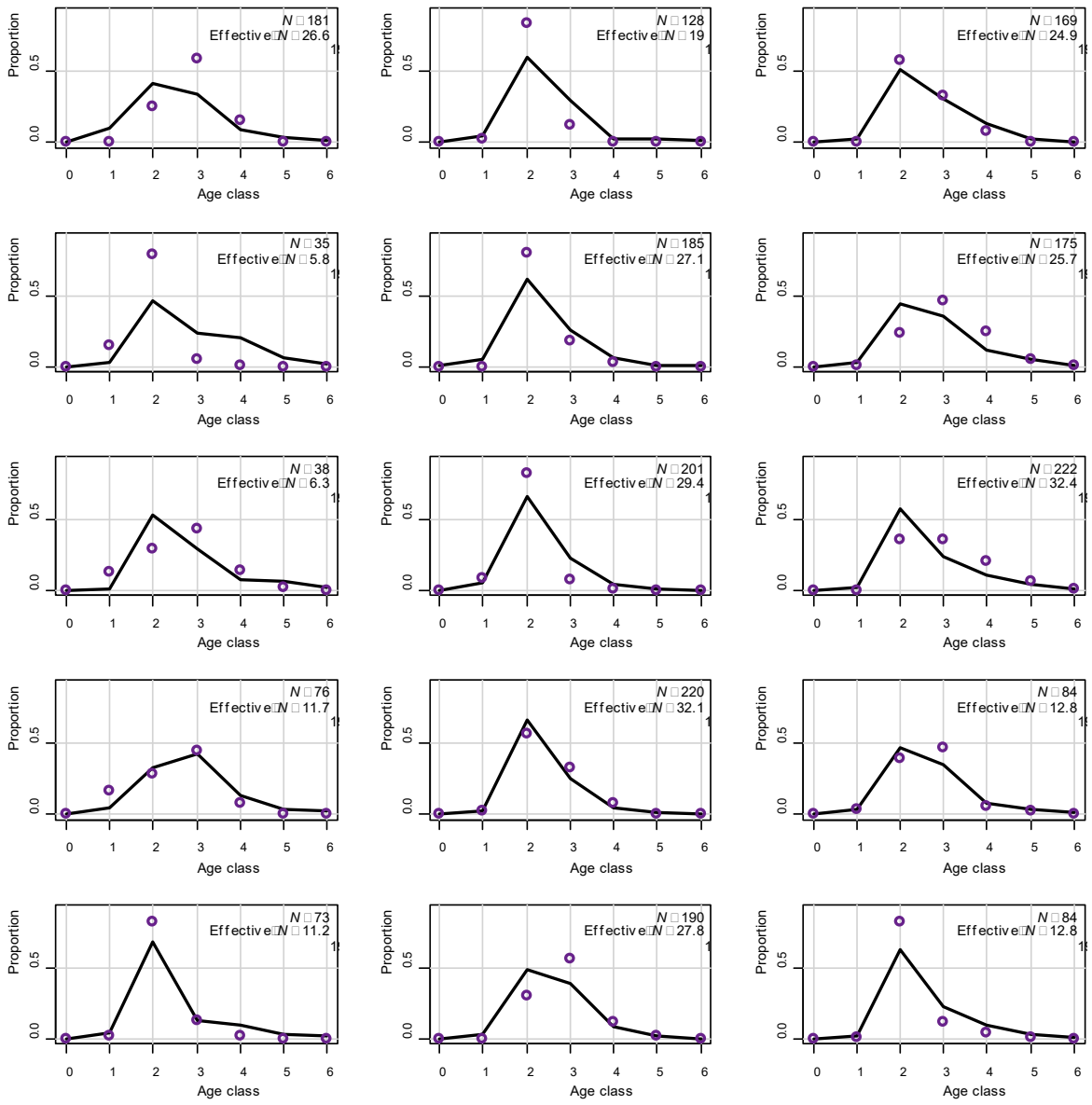


Figure A13. ***Continued***

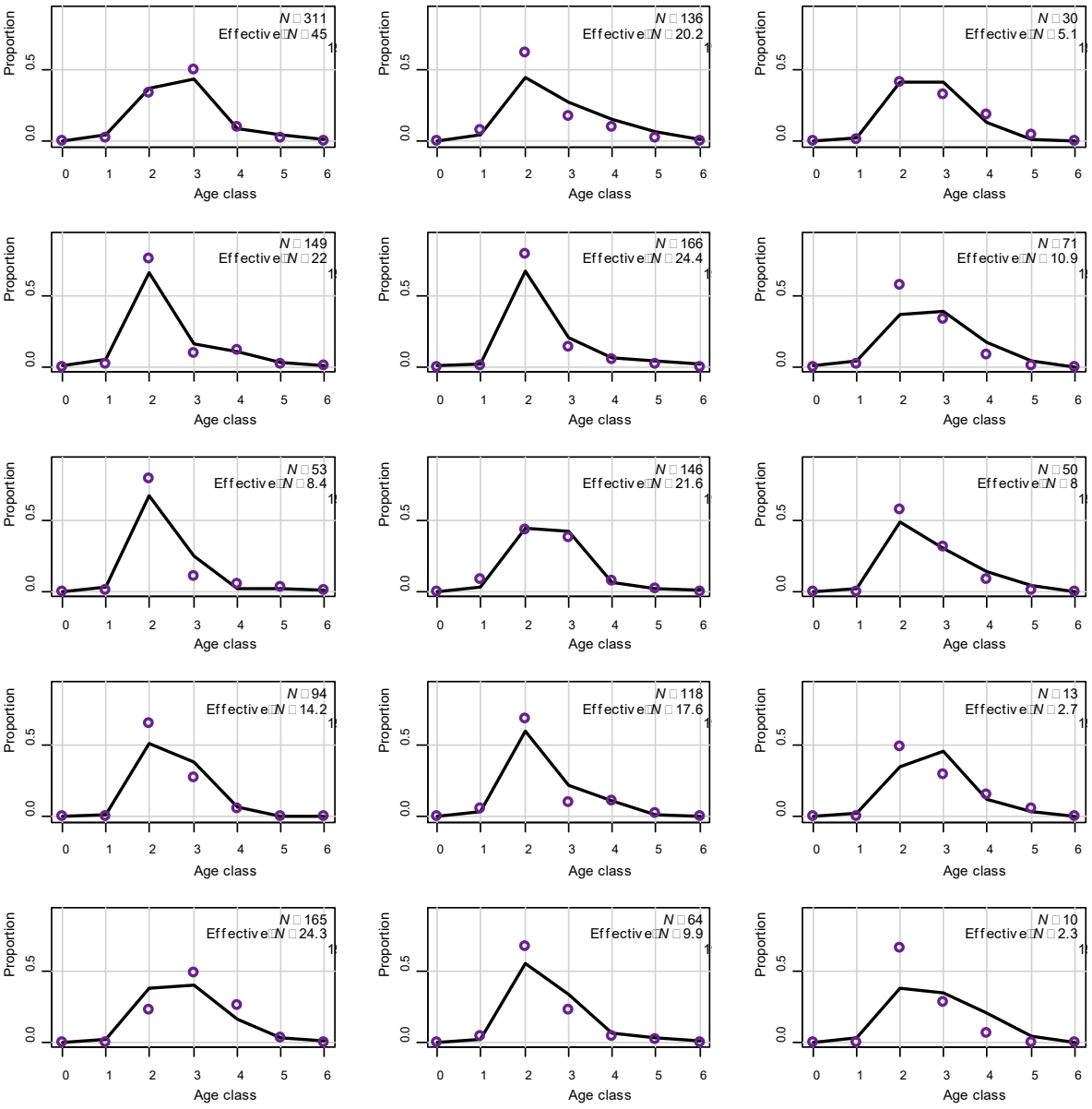


Figure A13. ***Continued***

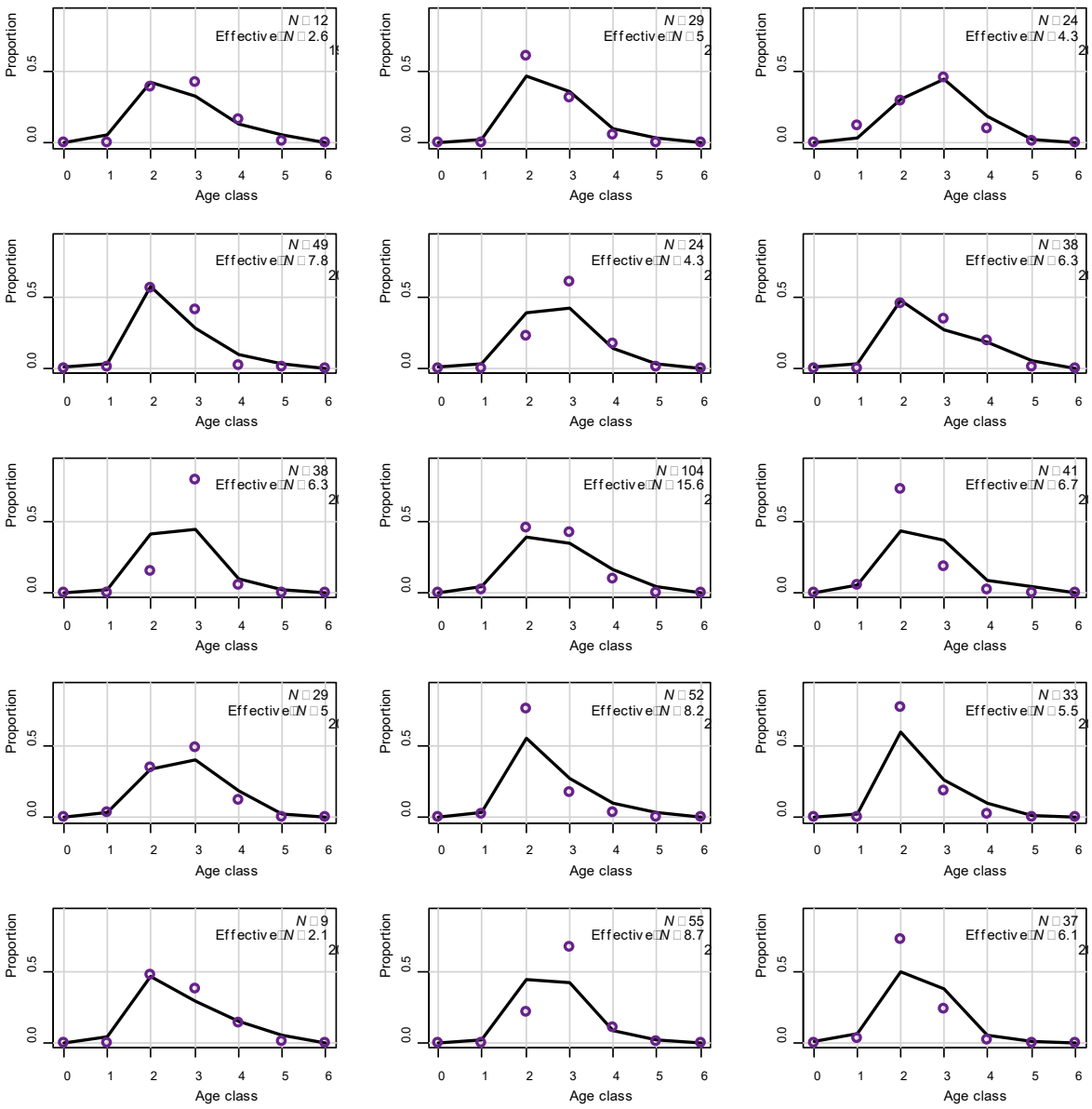


Figure A13. ***Continued***

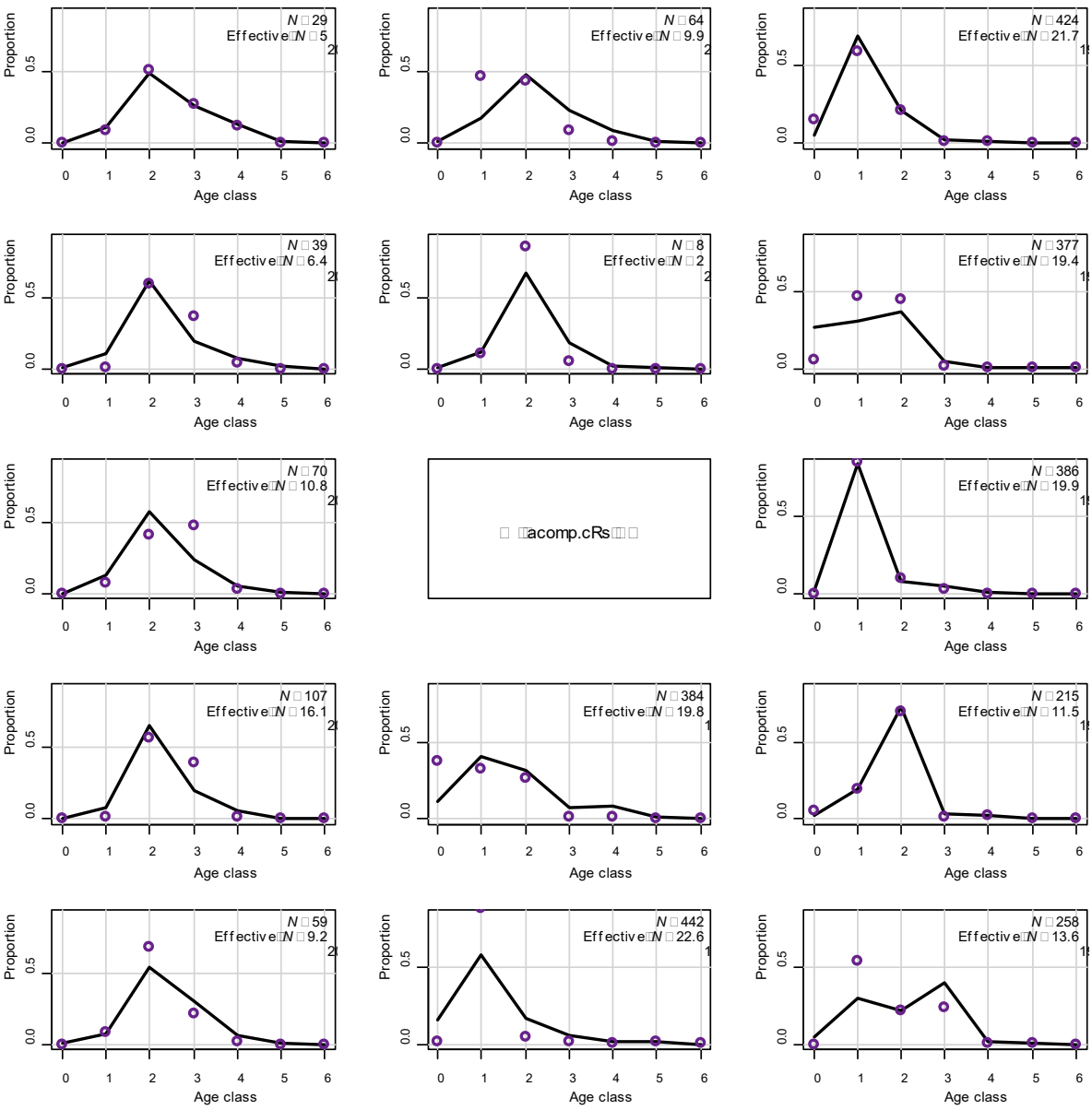


Figure A13. ***Continued***

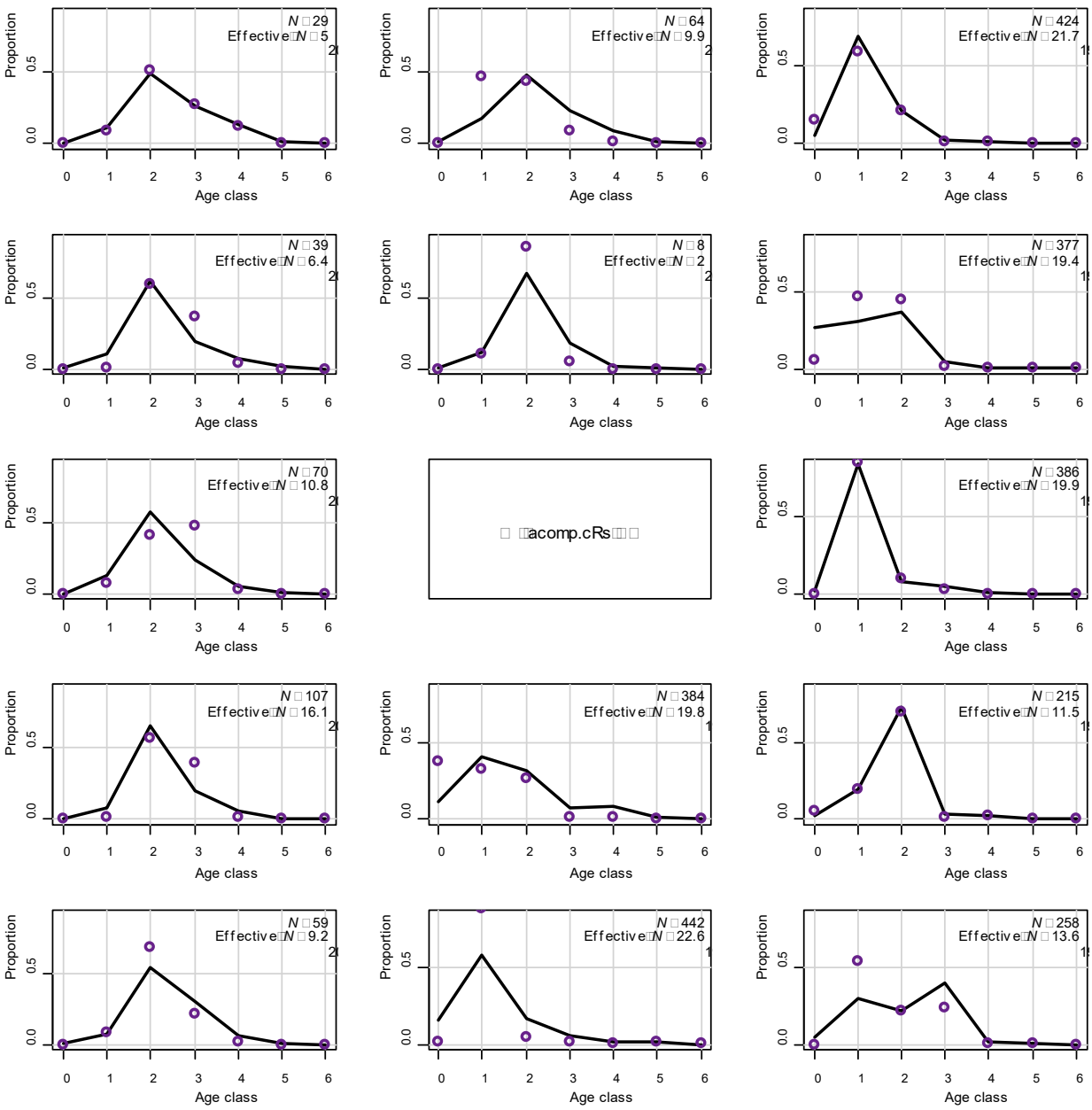


Figure A14. Annual age composition plots for the commercial reduction south fleet for 1955-2021. Open circles are the observed data, while the line indicates the model fit.

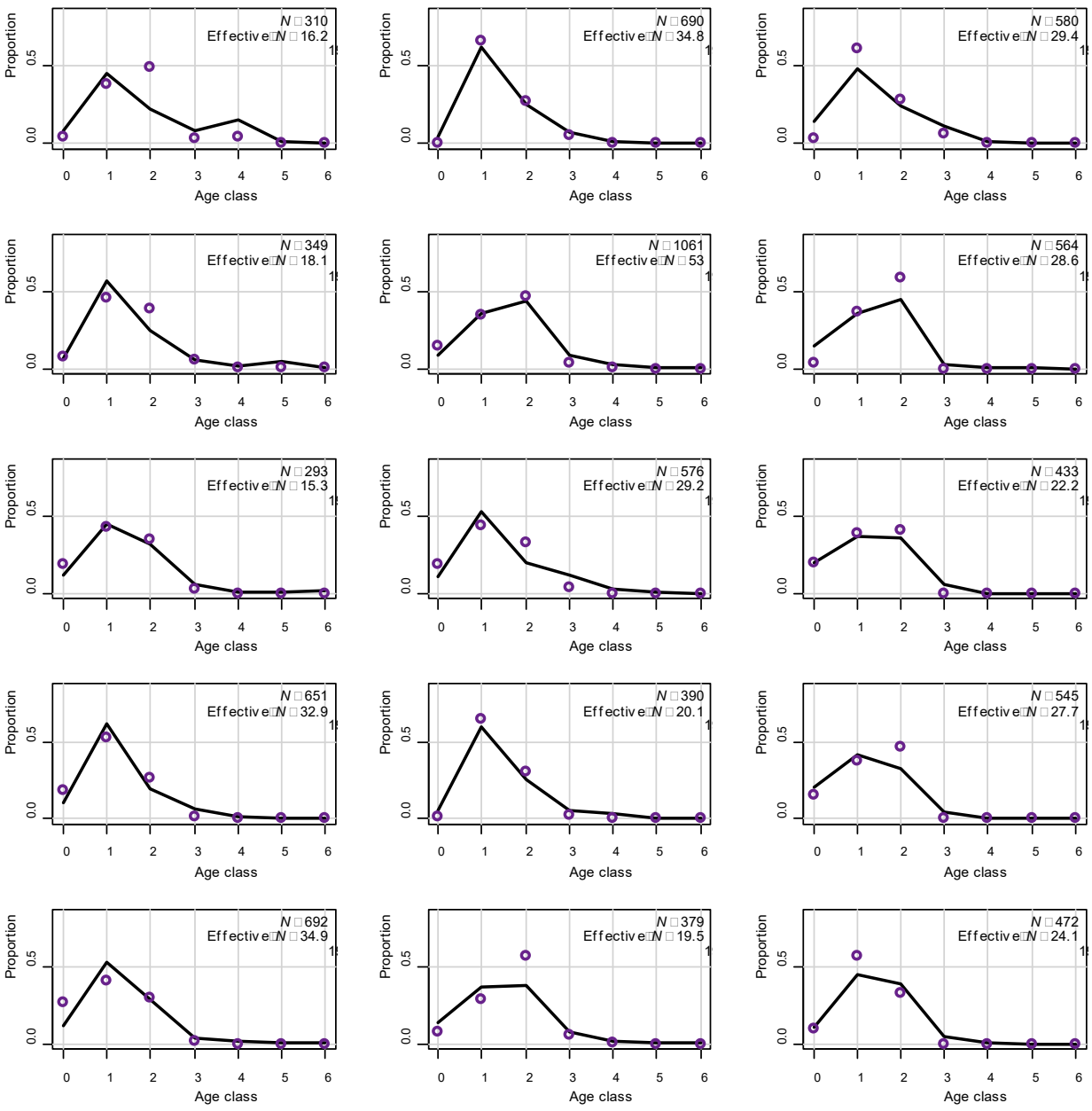


Figure A14. ***Continued***

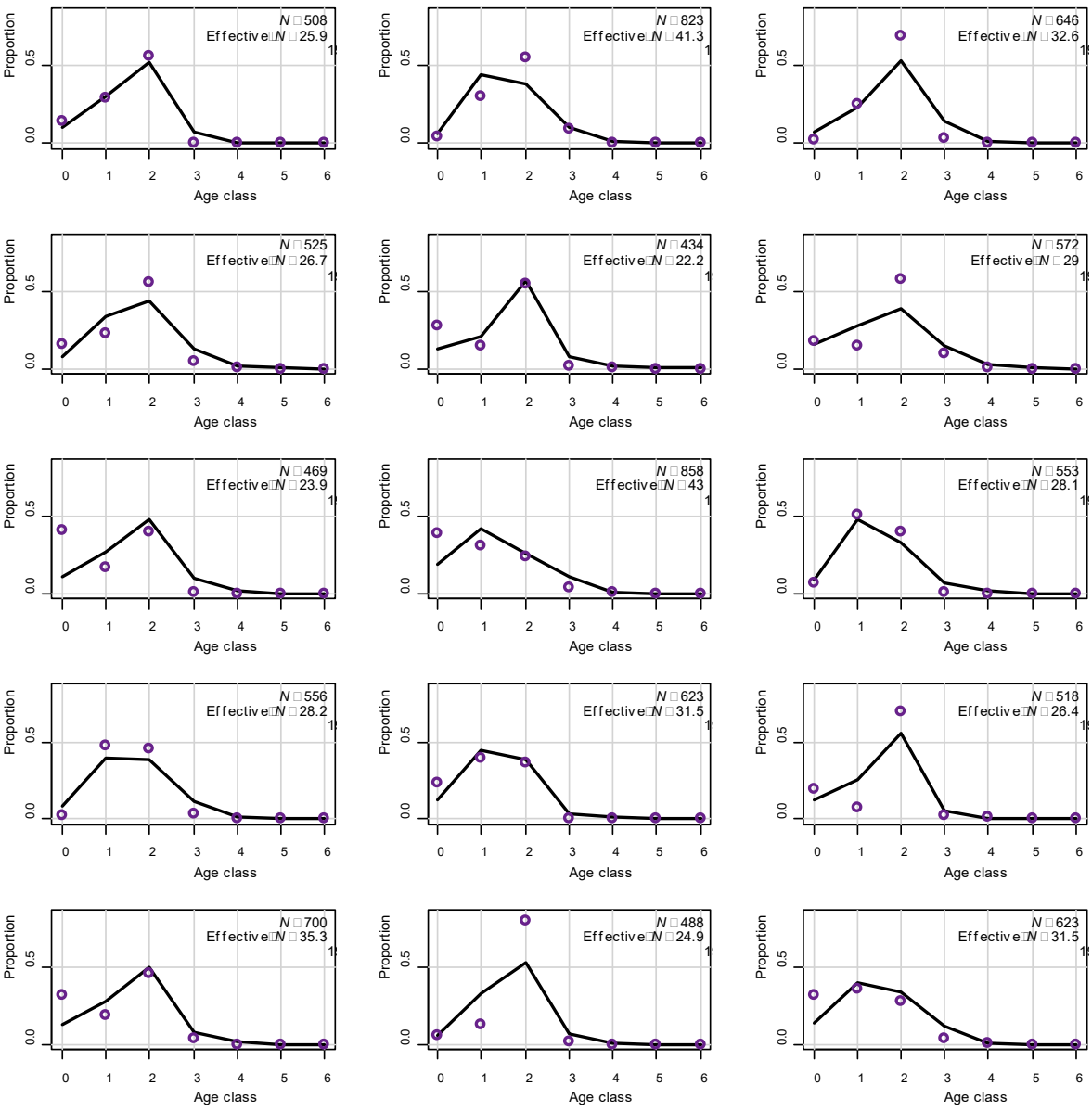


Figure A14. ***Continued***

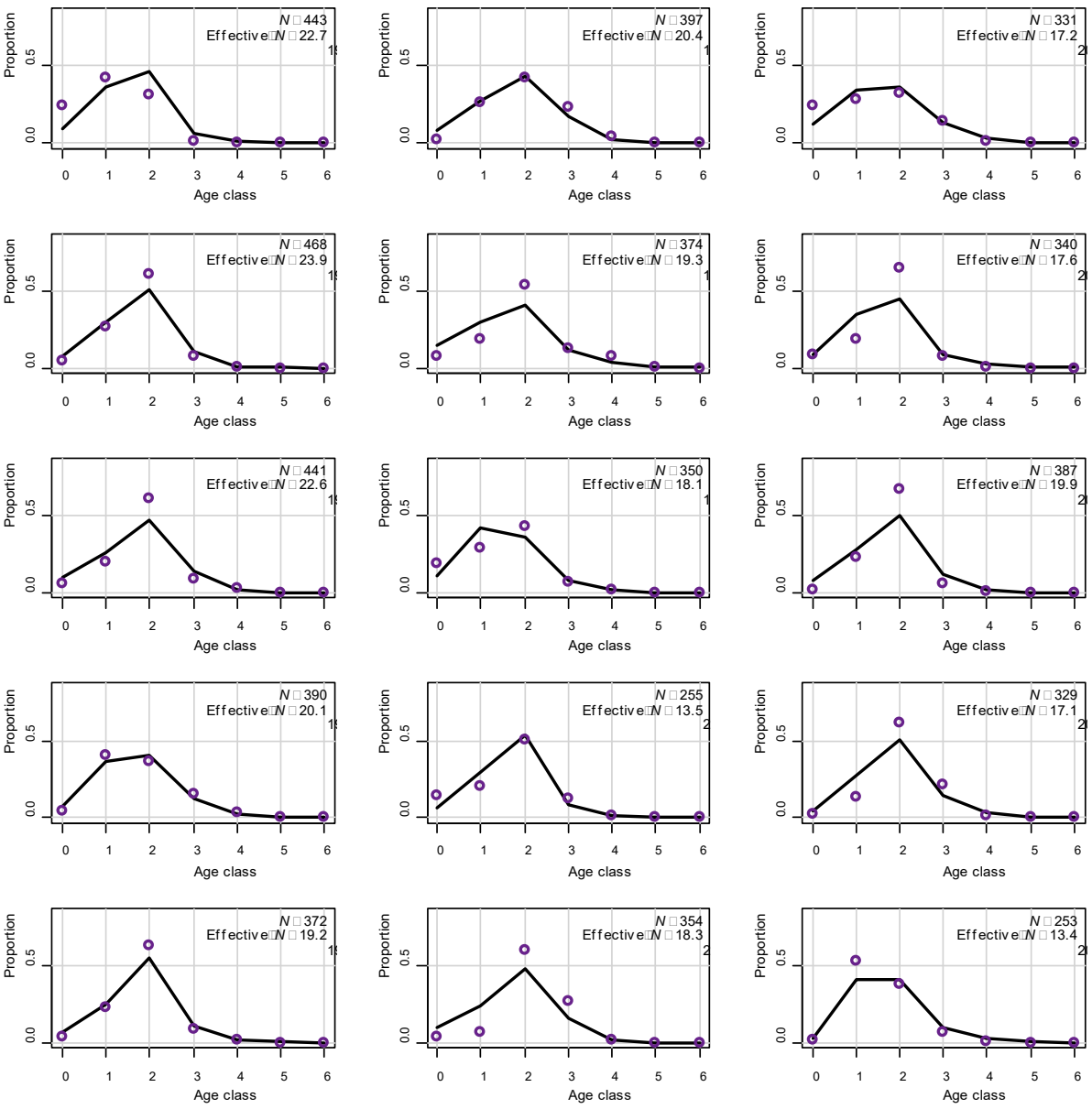


Figure A14. ***Continued***

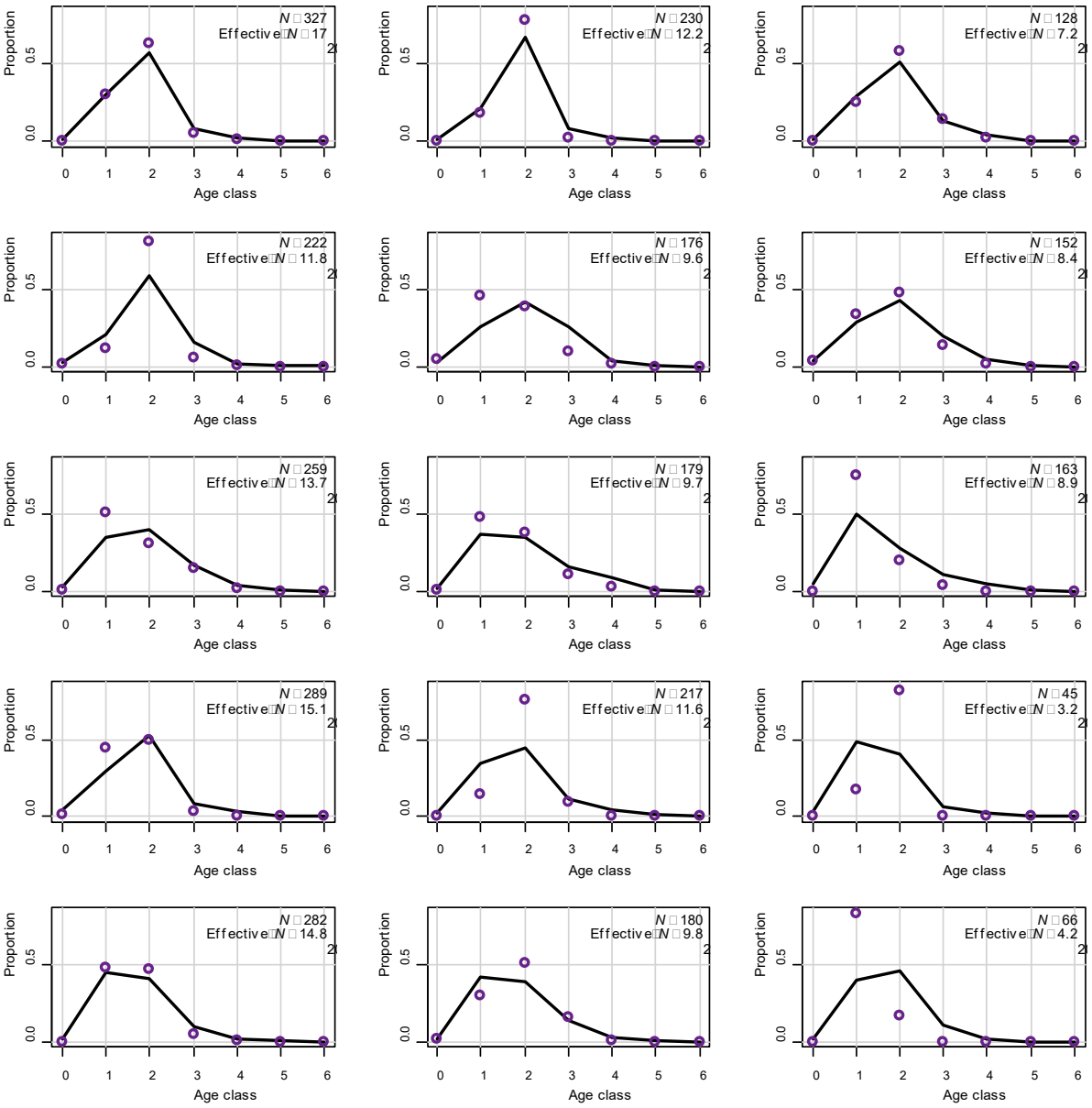


Figure A14. ***Continued***

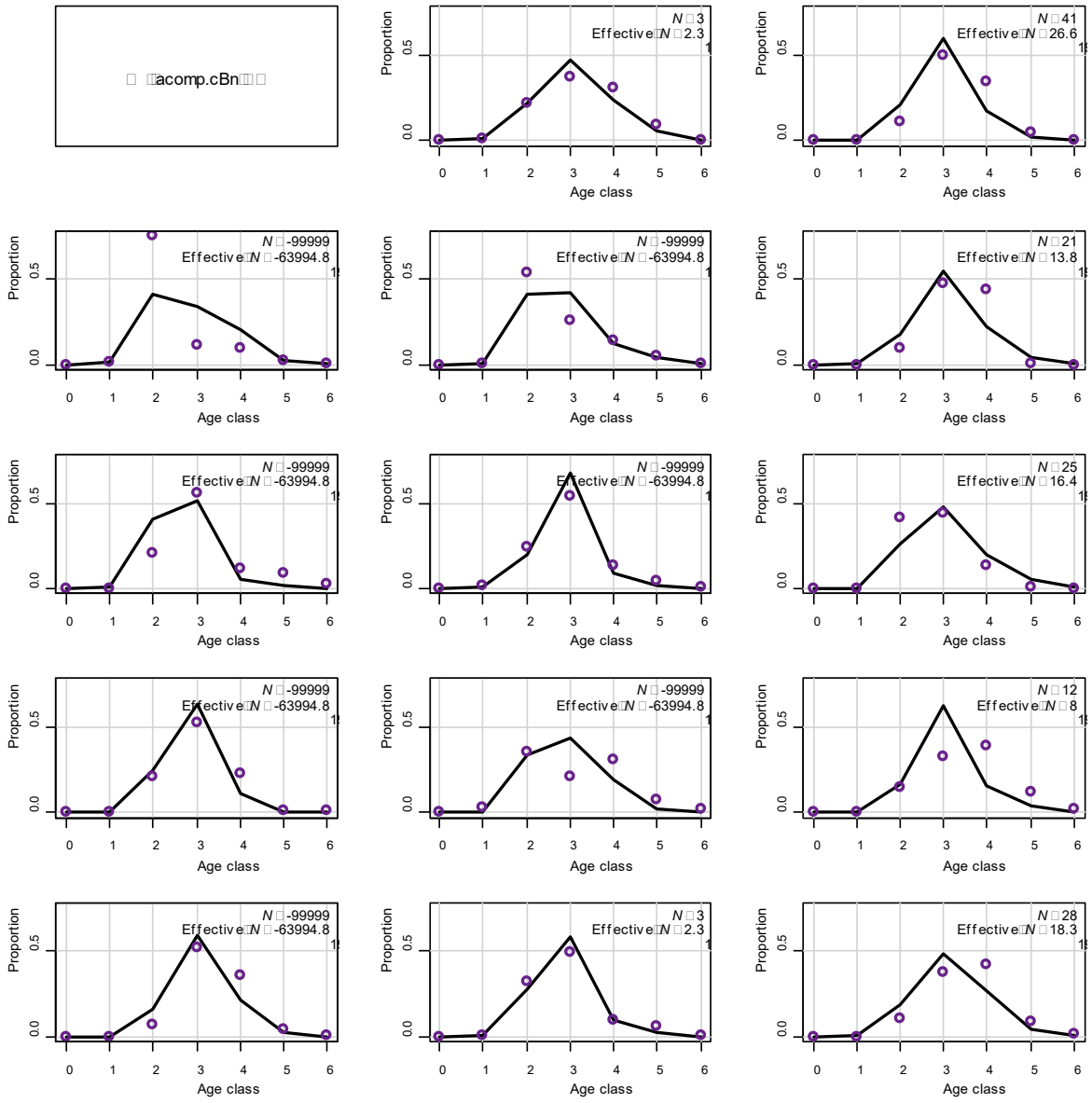


Figure A15. Annual age composition plots for the commercial bait north fleet for 1985-2021. Open circles are the observed data, while the line indicates the model fit.

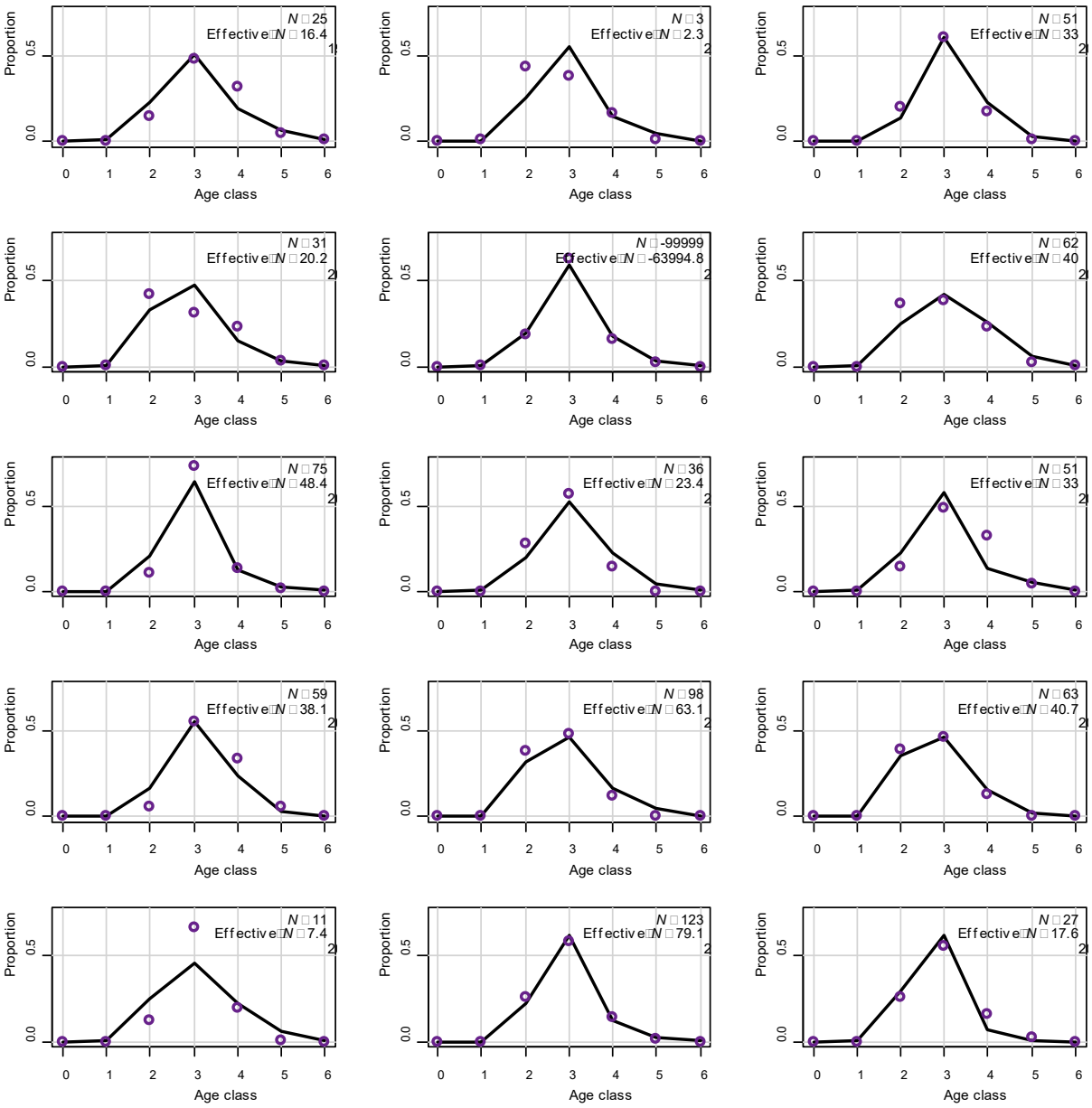


Figure A15. ***Continued***

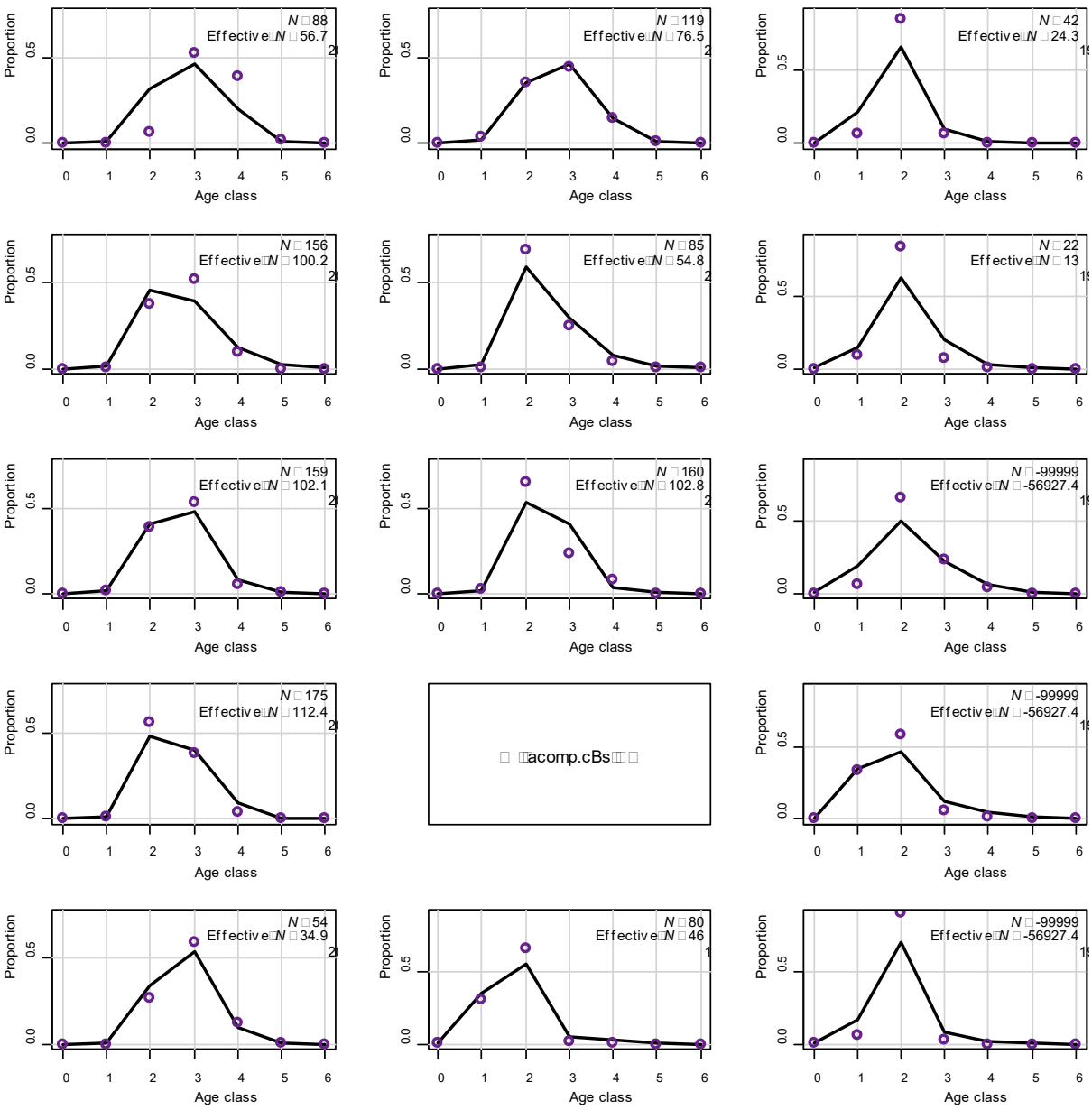


Figure A15. ***Continued***

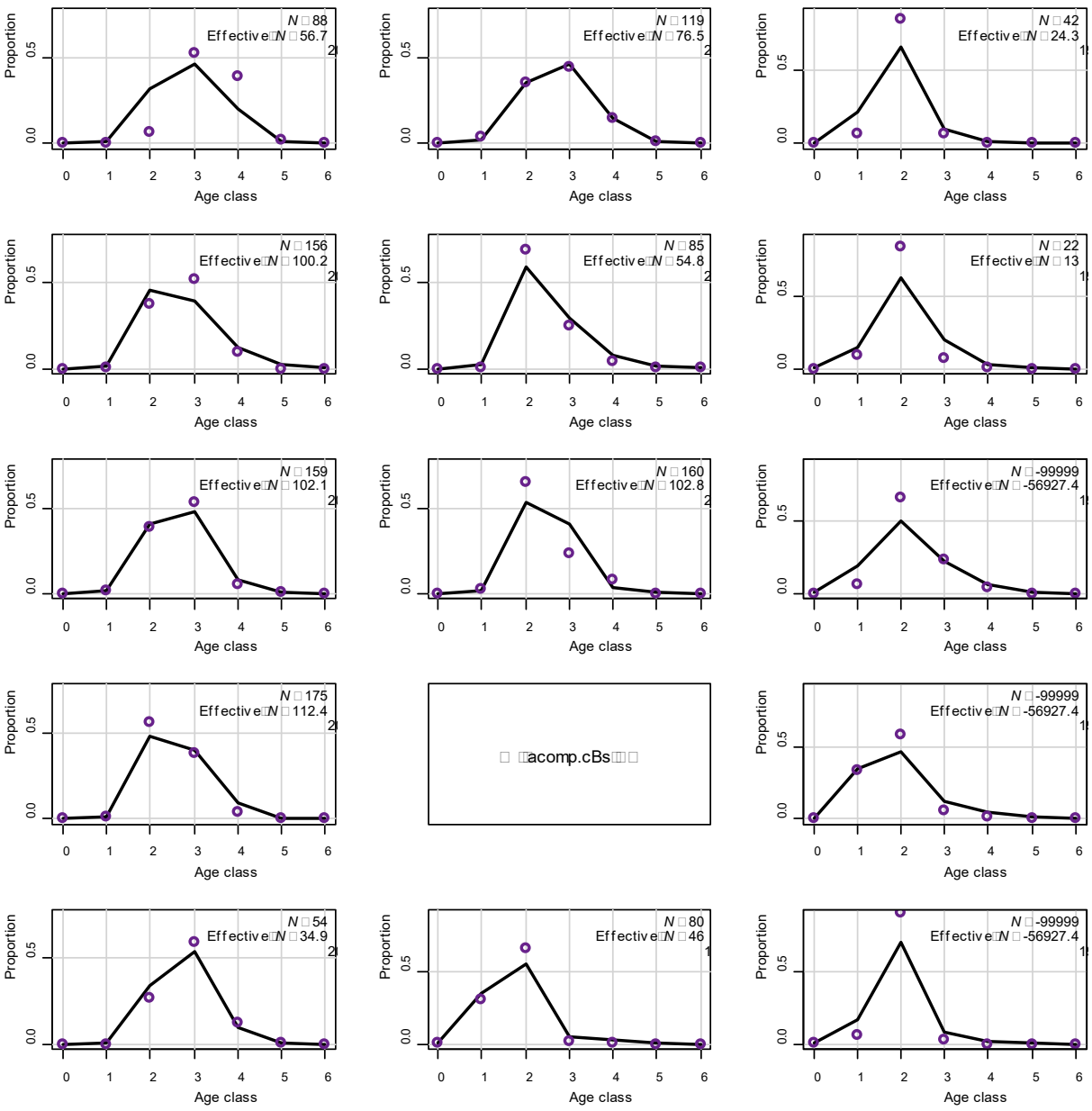


Figure A16. Annual age composition plots for the commercial bait south fleet for 1985-2021. Open circles are the observed data, while the line indicates the model fit.

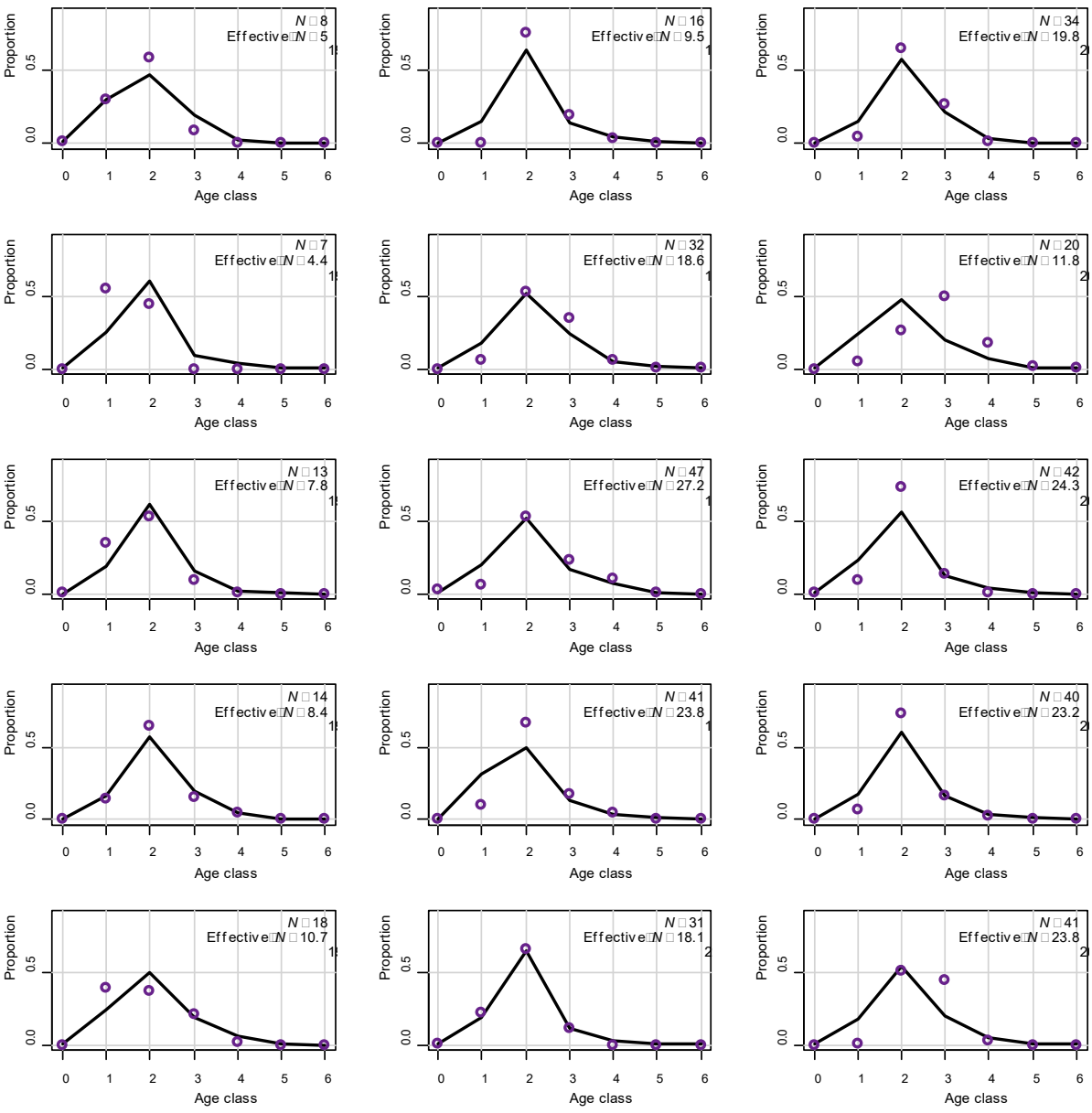


Figure A16. ***Continued***

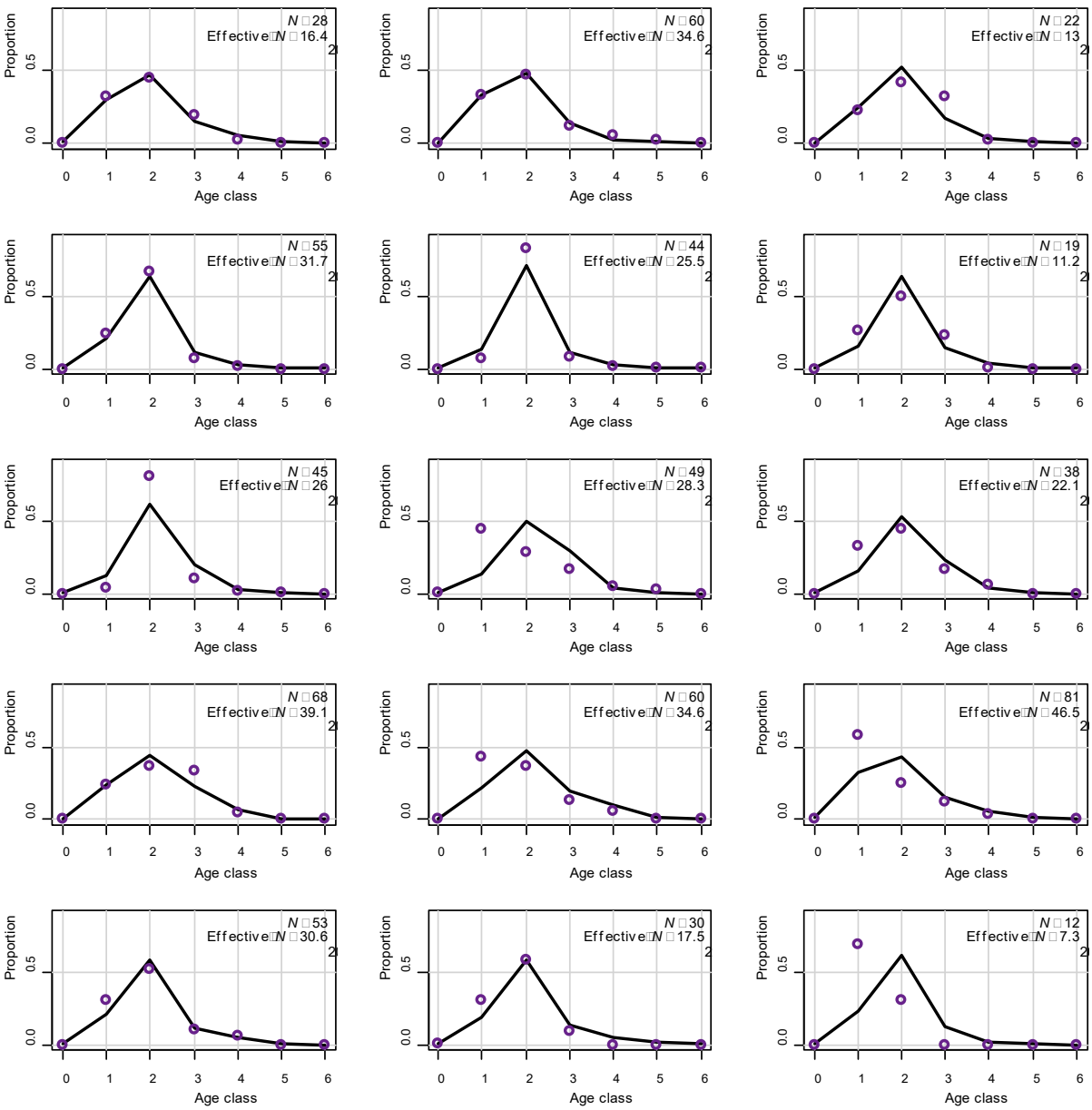


Figure A16. ***Continued***

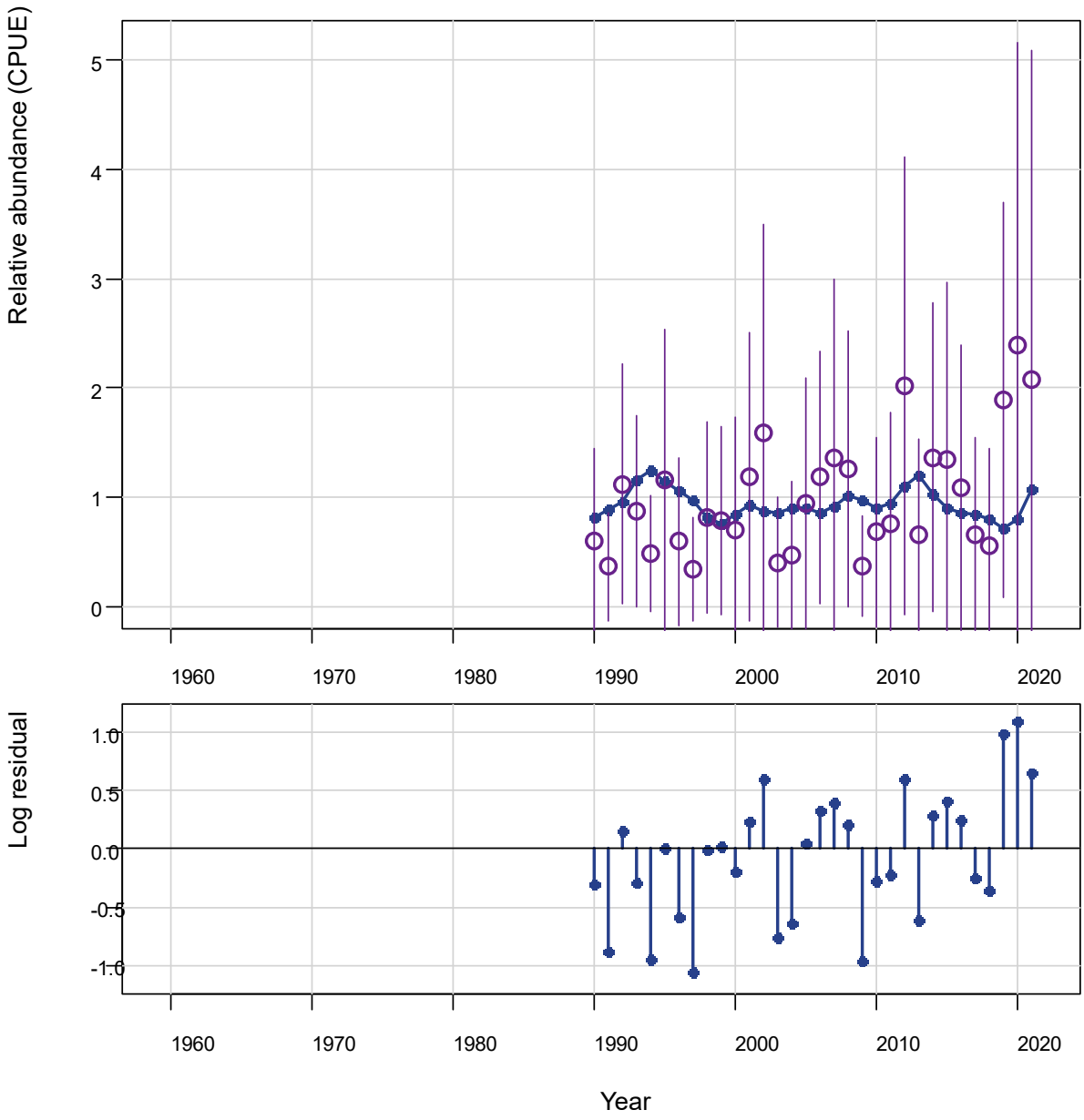


Figure A17. Predicted fit (blue, closed circle with line) to the observed (open circle) NAD index. The lower panel indicates the residual for each data point.

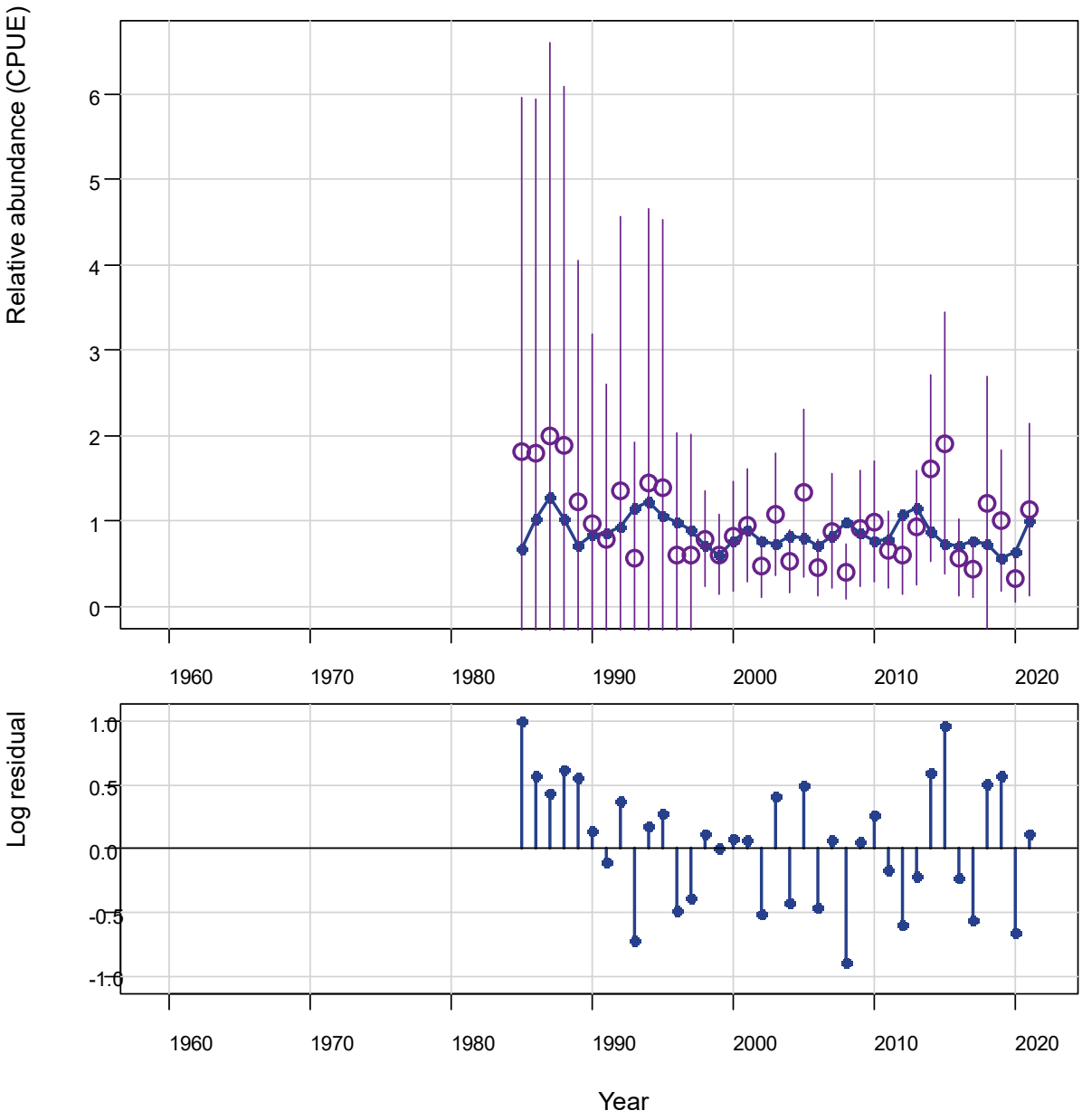


Figure A18. Predicted fit (blue, closed circle with line) to the observed (open circle) MAD index. The lower panel indicates the residual for each data point.

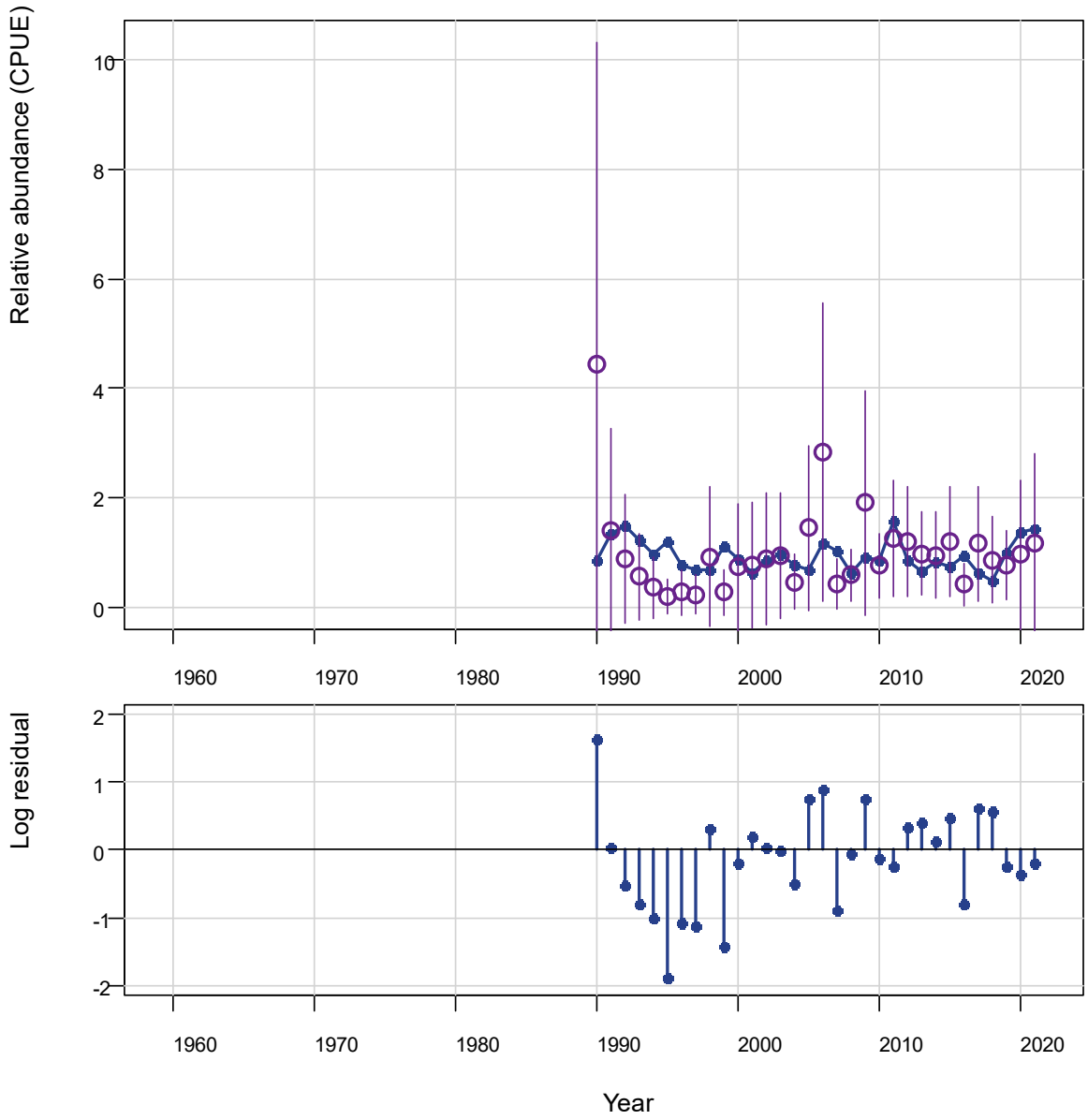


Figure A19. Predicted fit (blue, closed circle with line) to the observed (open circle) SAD index. The lower panel indicates the residual for each data point.

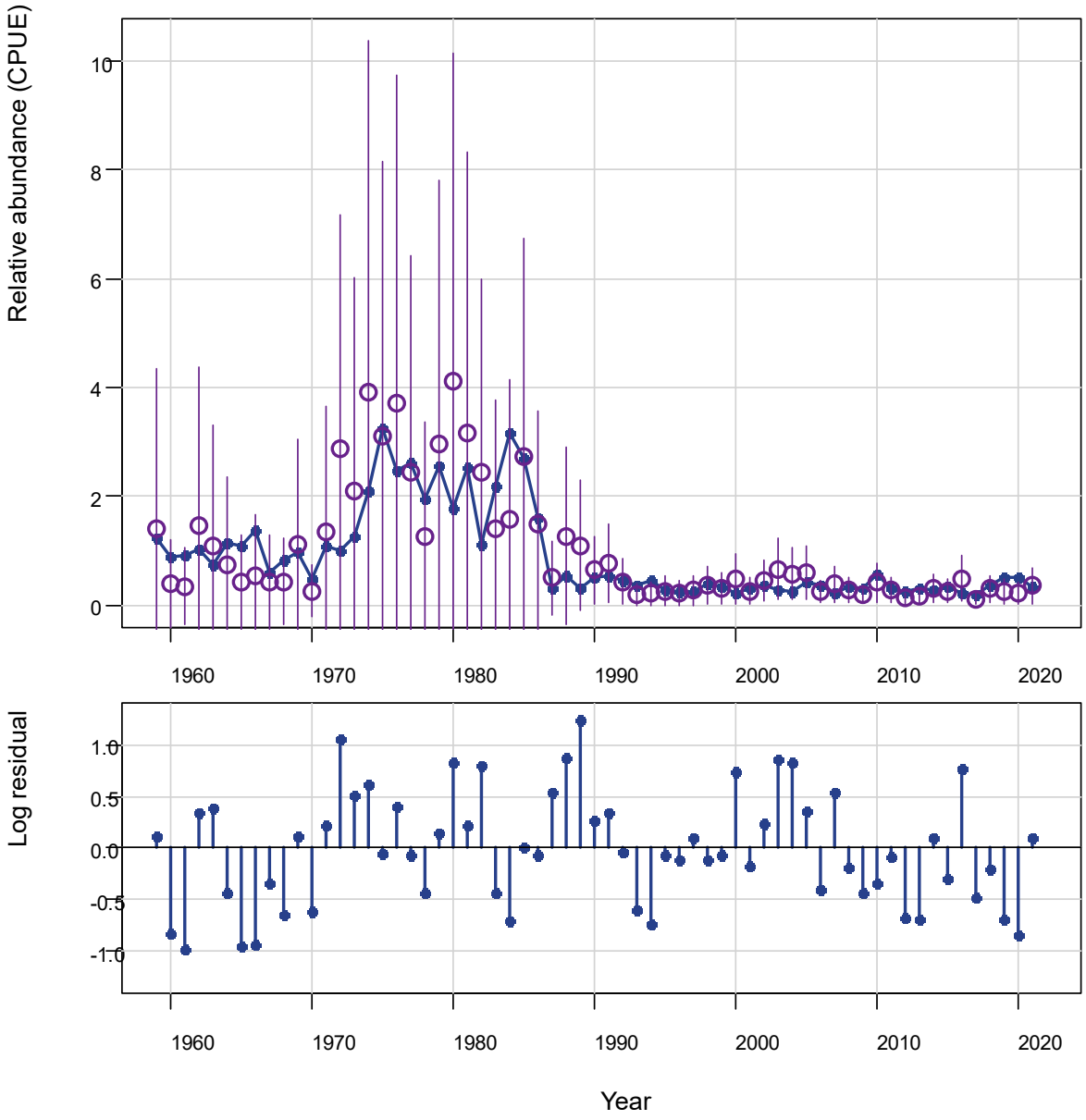


Figure A20. Predicted fit (blue, closed circle with line) to the observed (open circle) recruitment index. The lower panel indicates the residual for each data point.

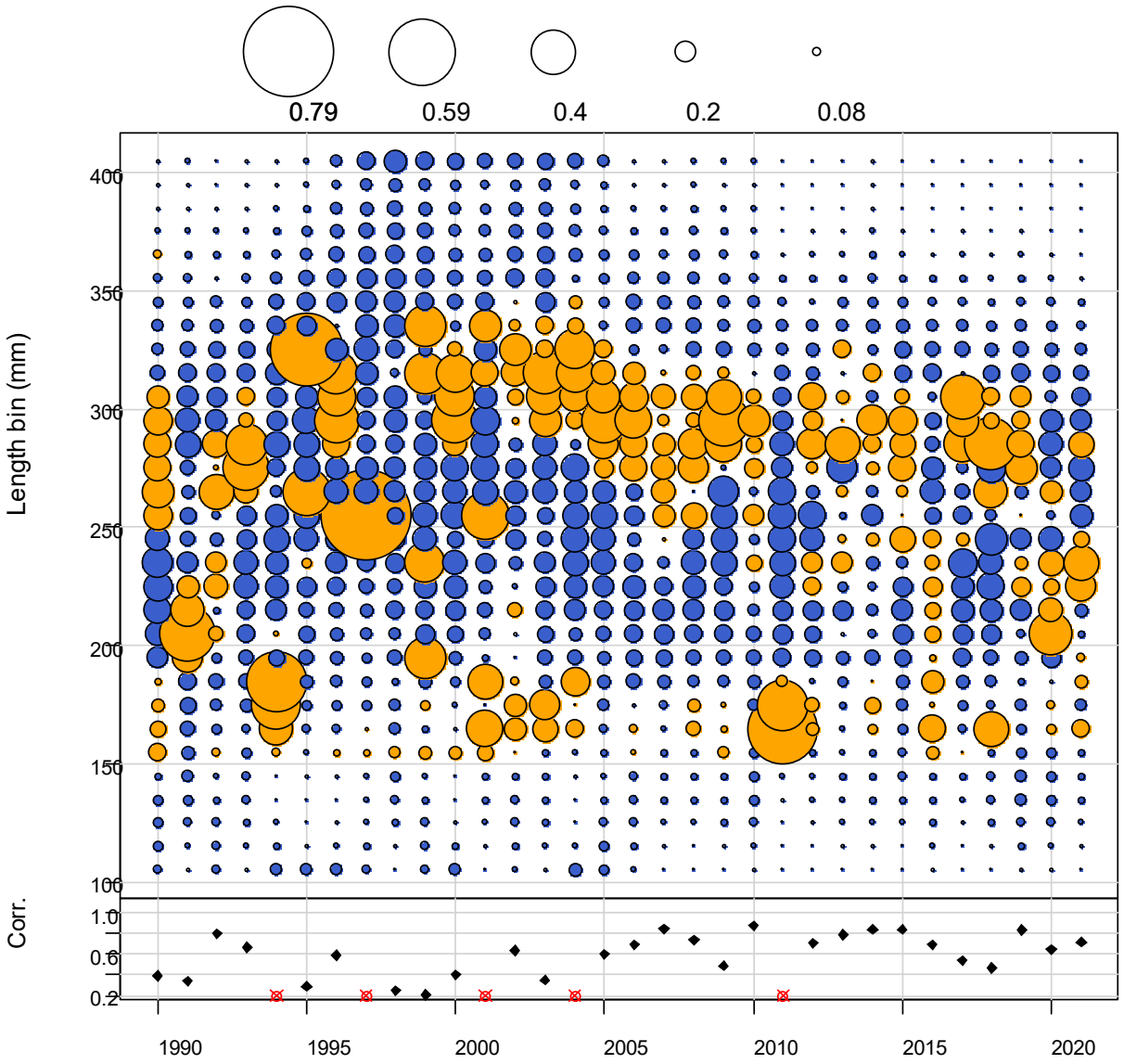


Figure A21. Bubble plot of the fits to the length compositions for the NAD index. Orange indicates an underestimate, while blue indicates on overestimate. The bottom panel indicates the correlation between the observed data and the model prediction.

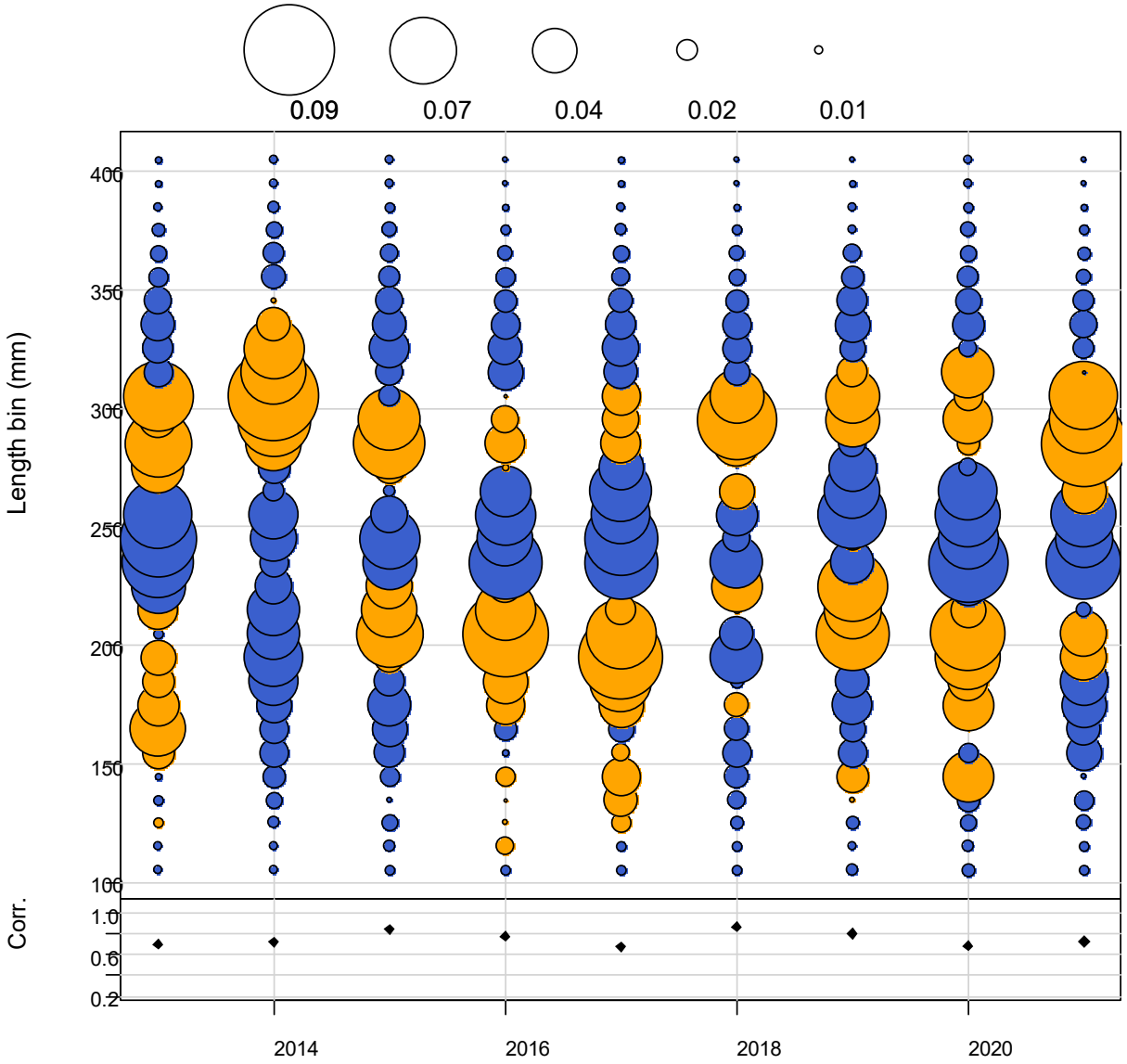


Figure A22. Bubble plot of the fits to the length compositions for the MAD index. Orange indicates an underestimate, while blue indicates on overestimate. The bottom panel indicates the correlation between the observed data and the model prediction.

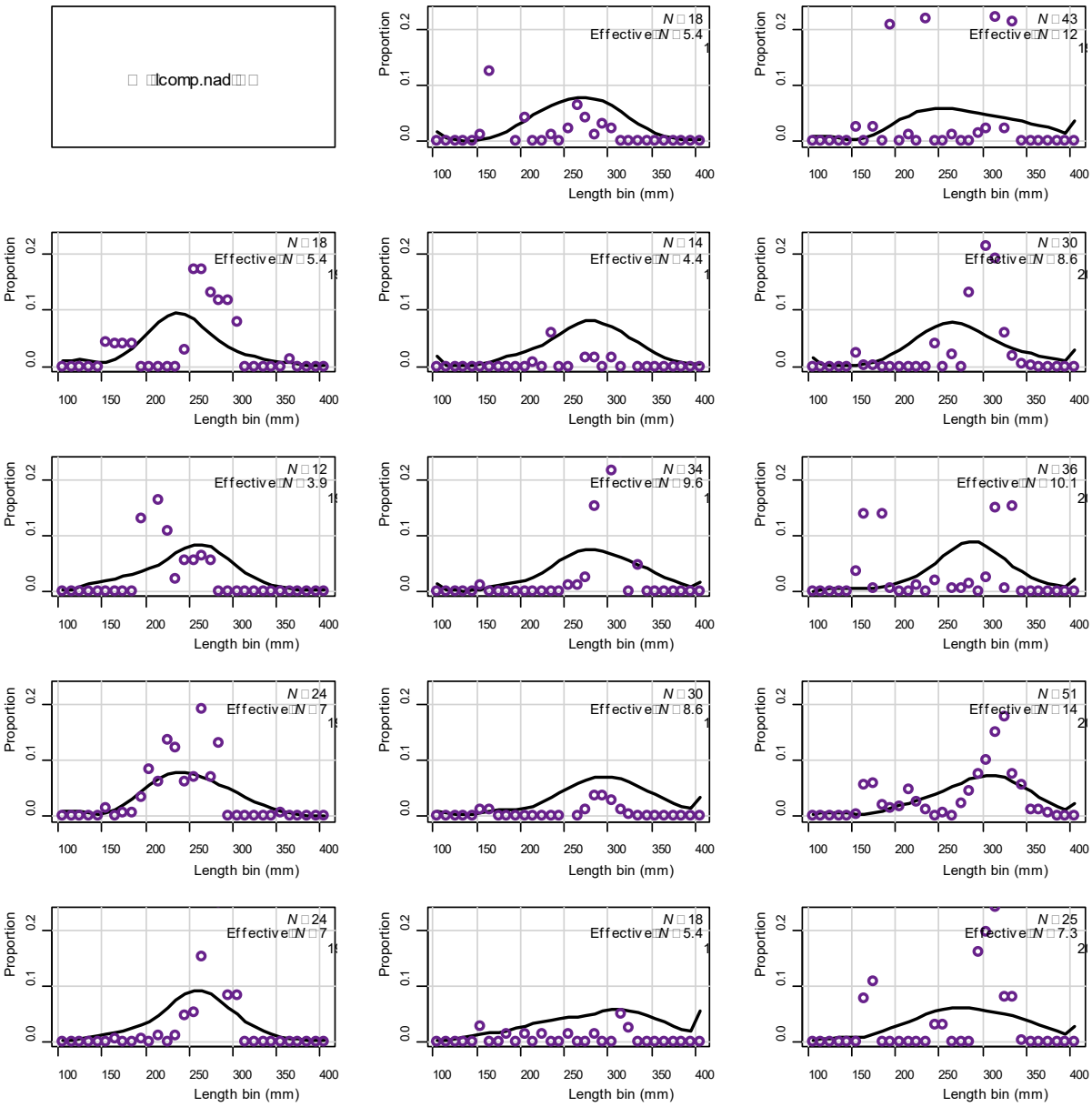


Figure A23. Annual length composition plots for the NAD index for 1990-2021. Open circles are the observed data, while the line indicates the model fit.

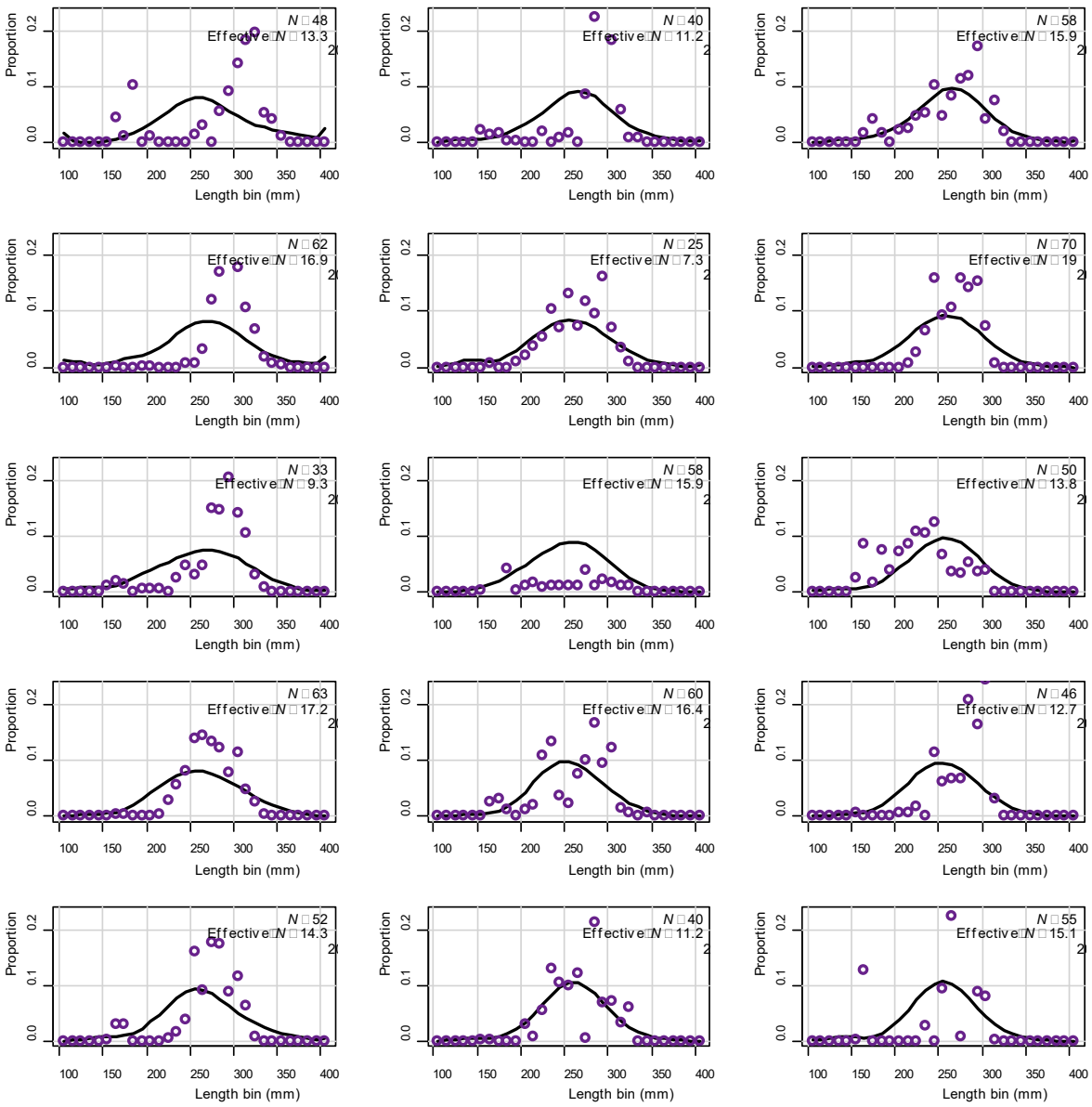


Figure A23. ***Continued***

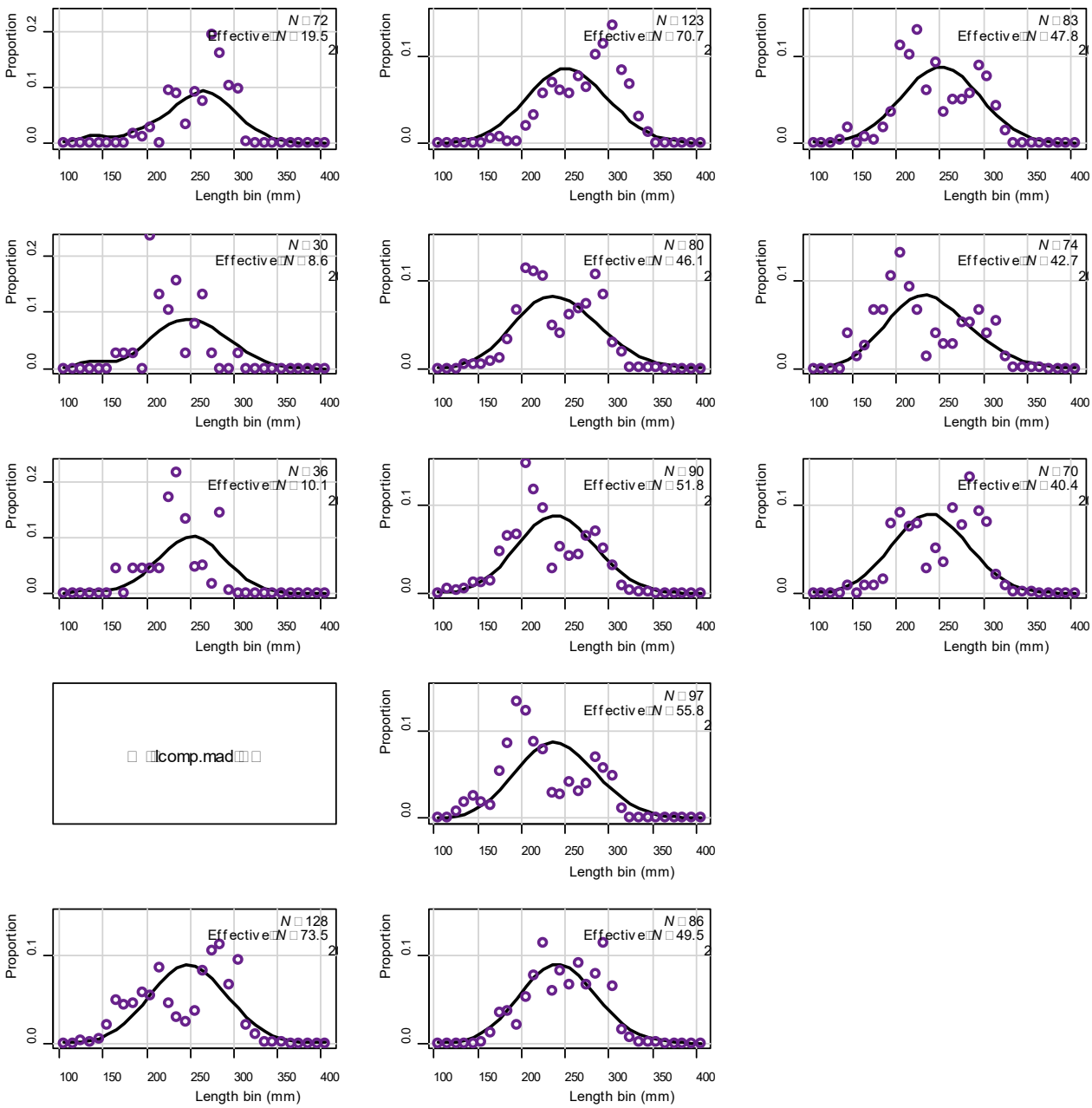


Figure A23. ***Continued***

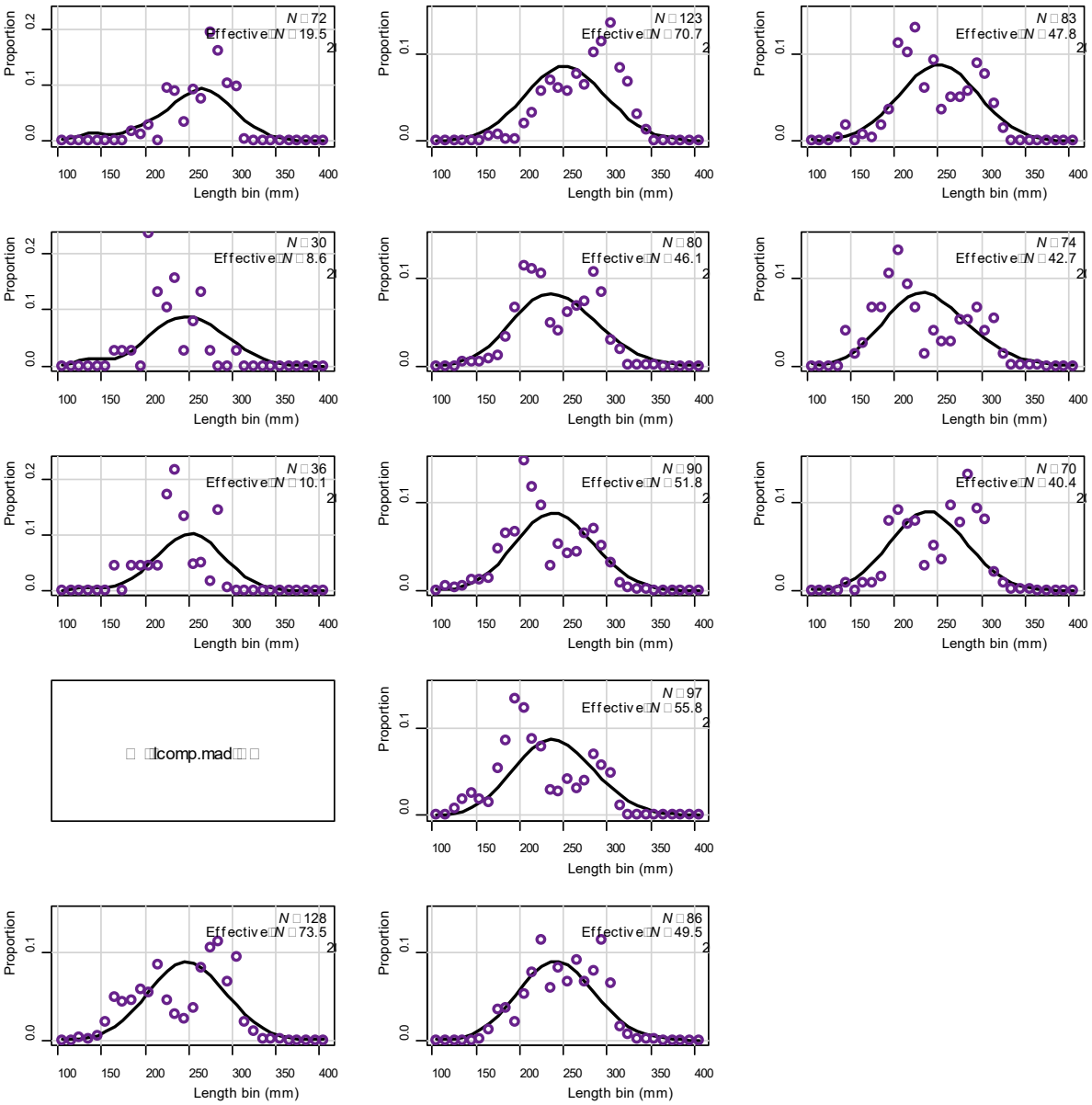


Figure A24. Annual length composition plots for the MAD index for 2013-2021. Open circles are the observed data, while the line indicates the model fit.

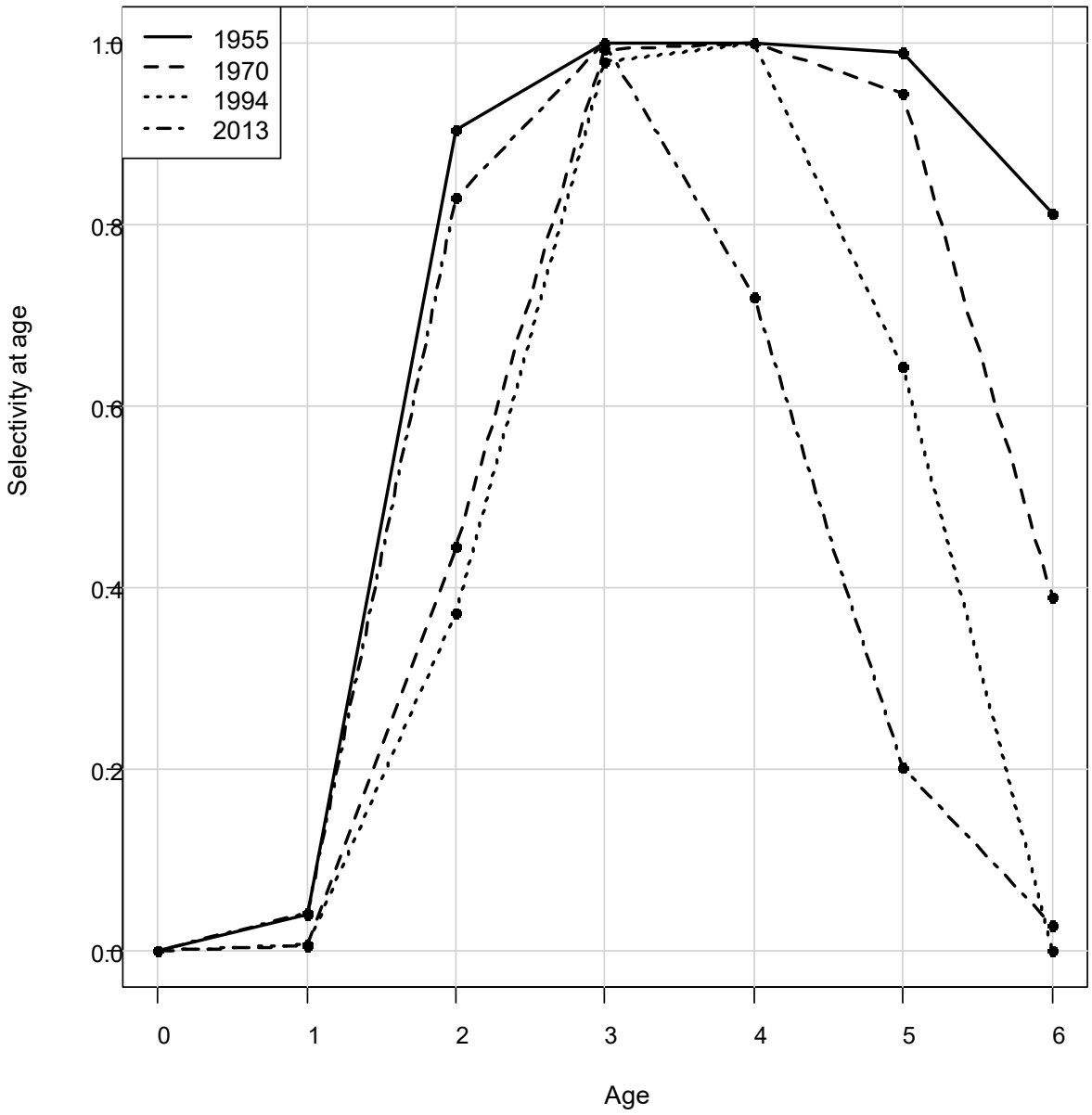


Figure A25. Estimated selectivity of the northern commercial reduction landings for 1955-1969, 1970-1993, 1994-2012, and 2013-2021.

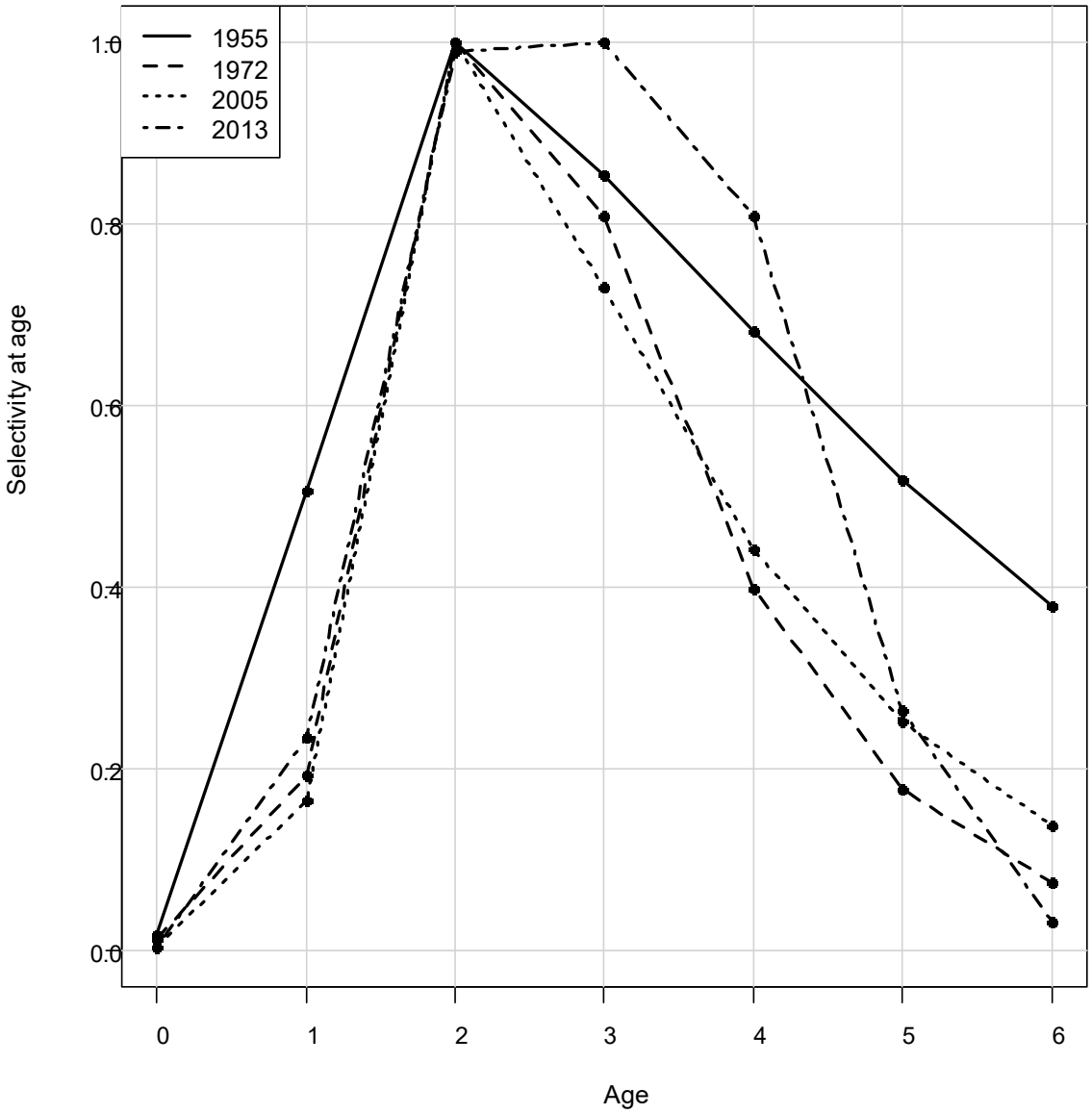


Figure A26. Estimated selectivity of the southern commercial reduction landings for 1955-1971, 1972-2004, 2005-2012, and 2013-2021.

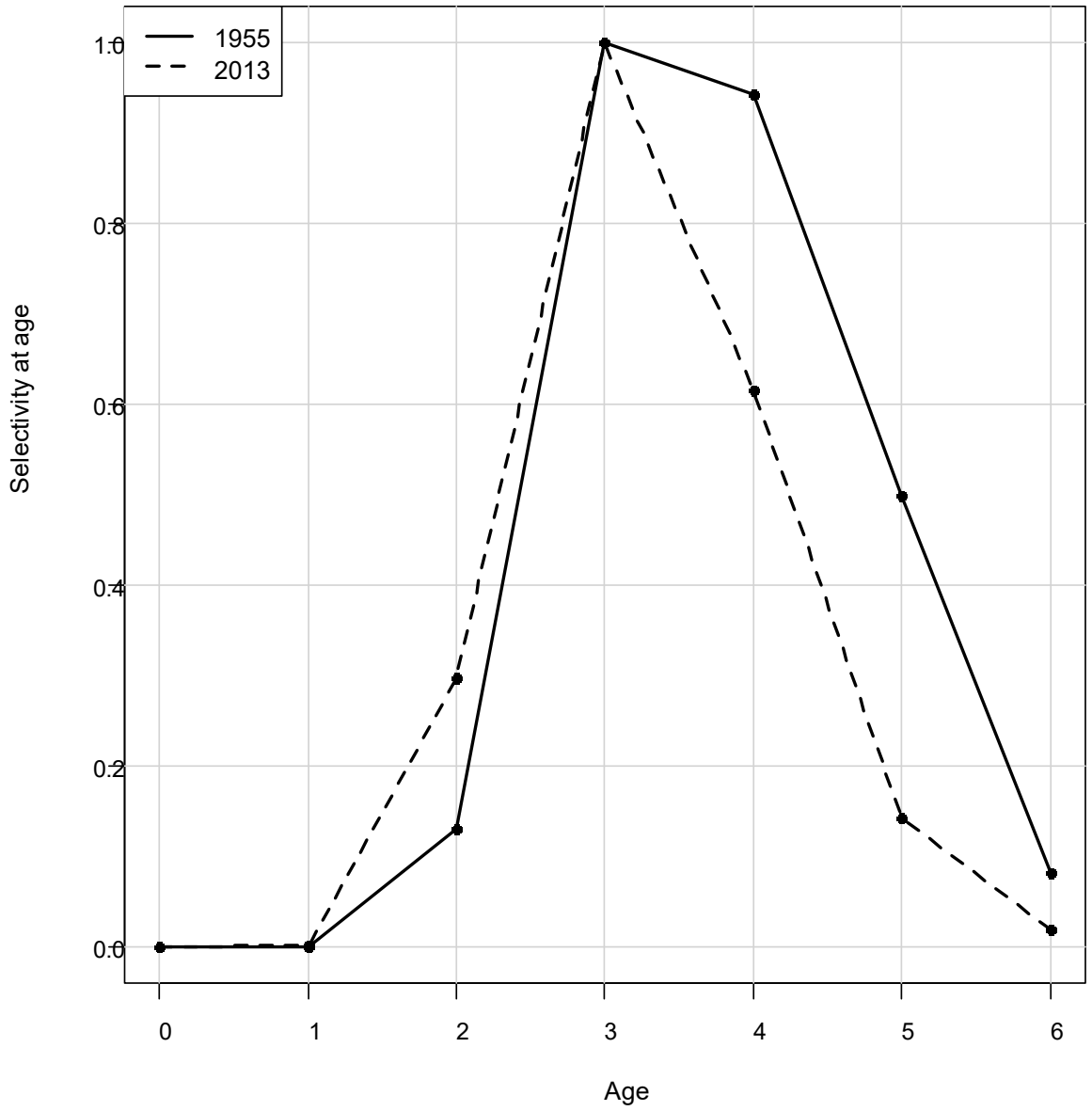


Figure A27. Estimated selectivity of the northern commercial bait landings for 1955-2012 and 2013-2021.

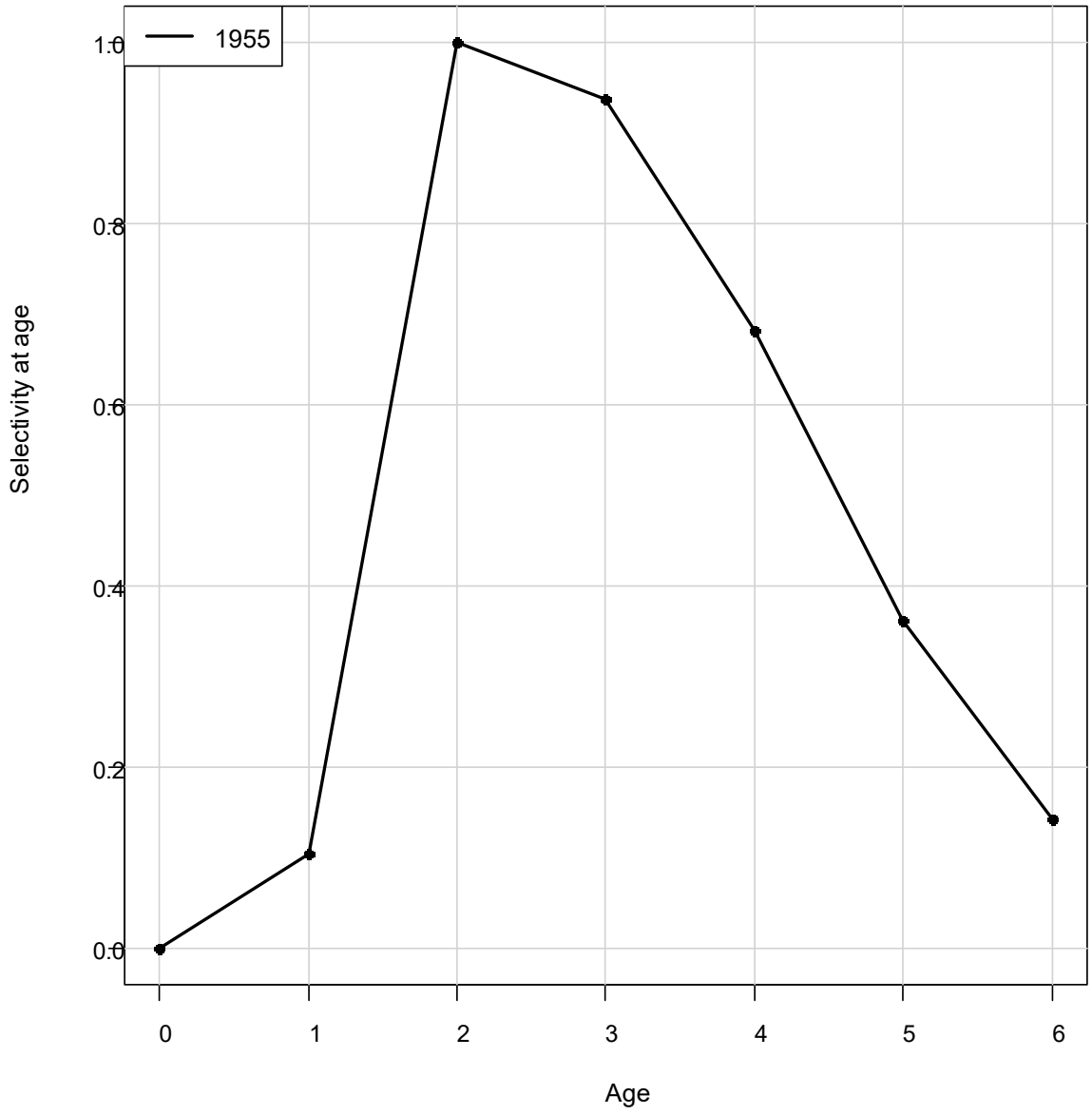


Figure A28. Estimated selectivity of the southern commercial bait landings for 1955-2021.

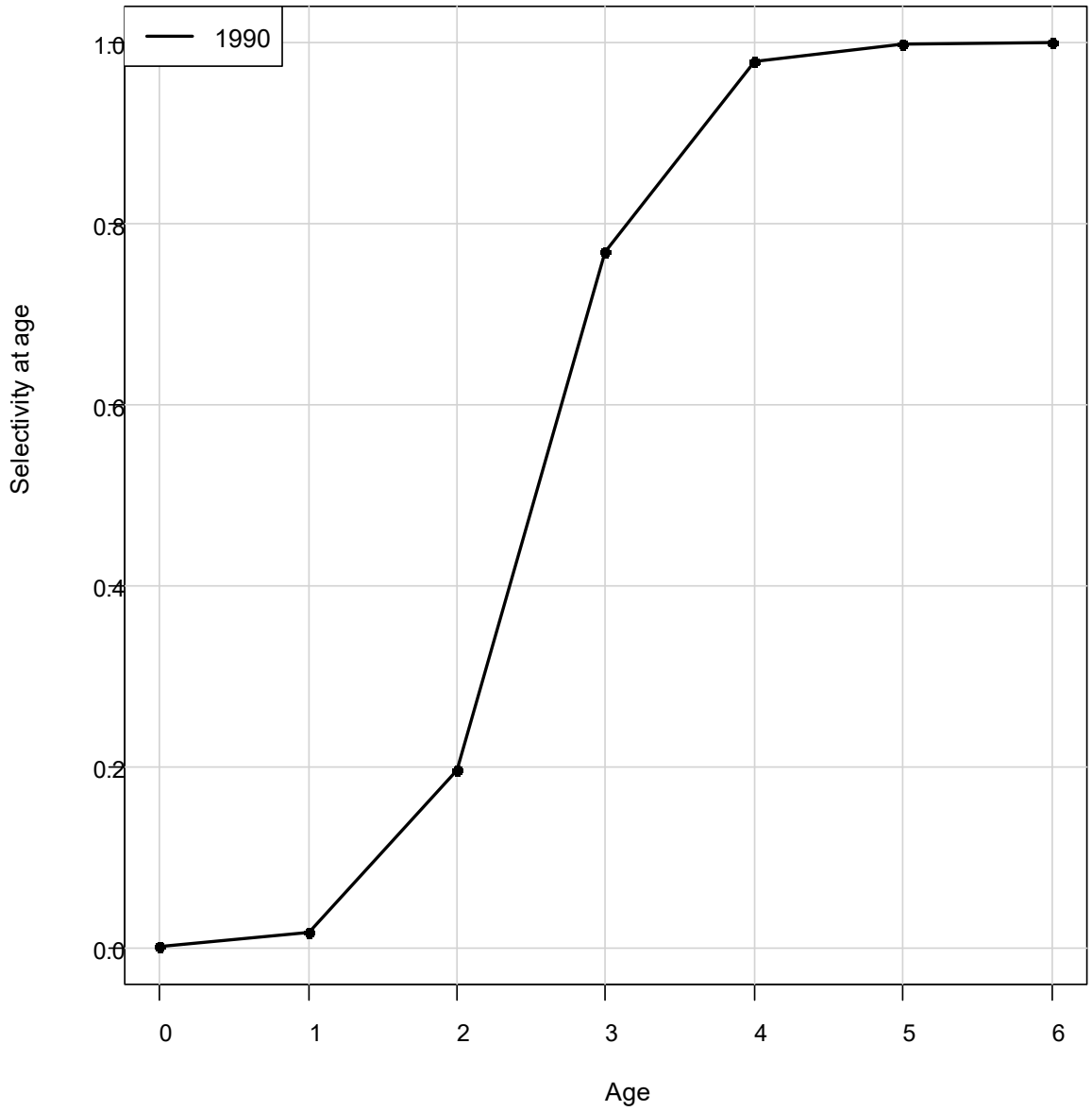


Figure A29. Estimated selectivity for the NAD index for 1990-2021.

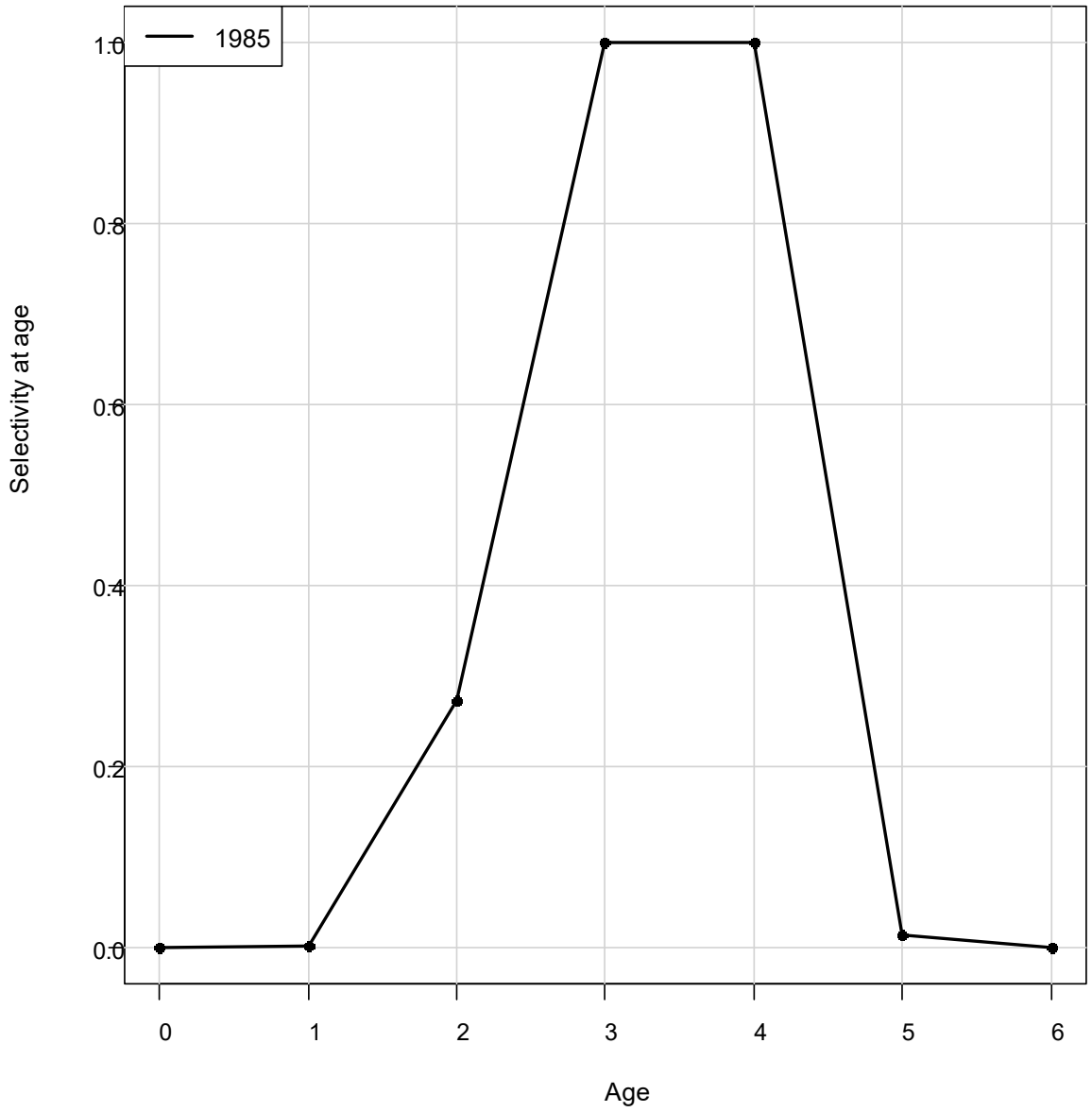


Figure A30. Estimated selectivity for the MAD index for 1985-2021.

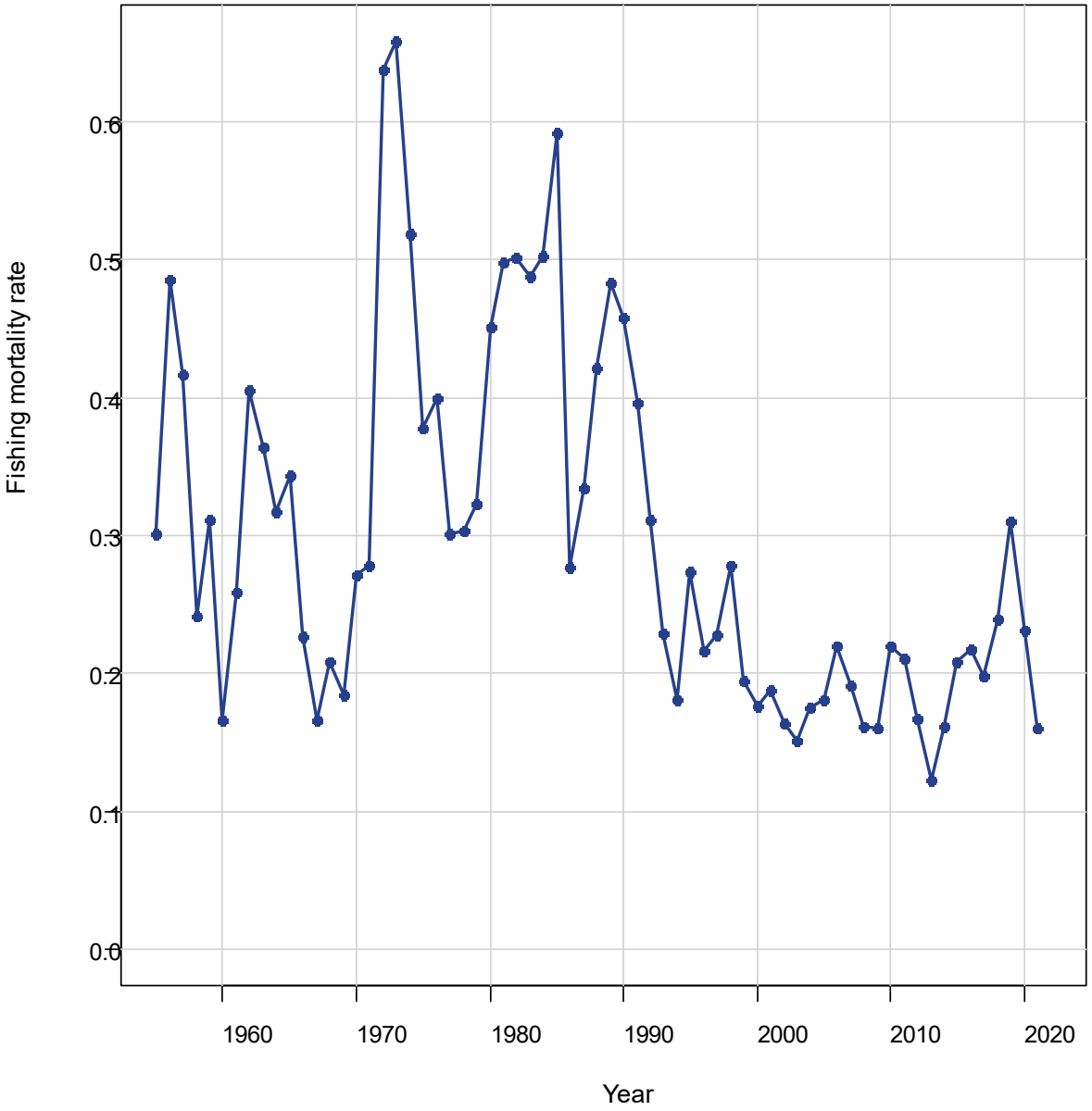


Figure A31. The full fishing mortality rate for 1955-2021.

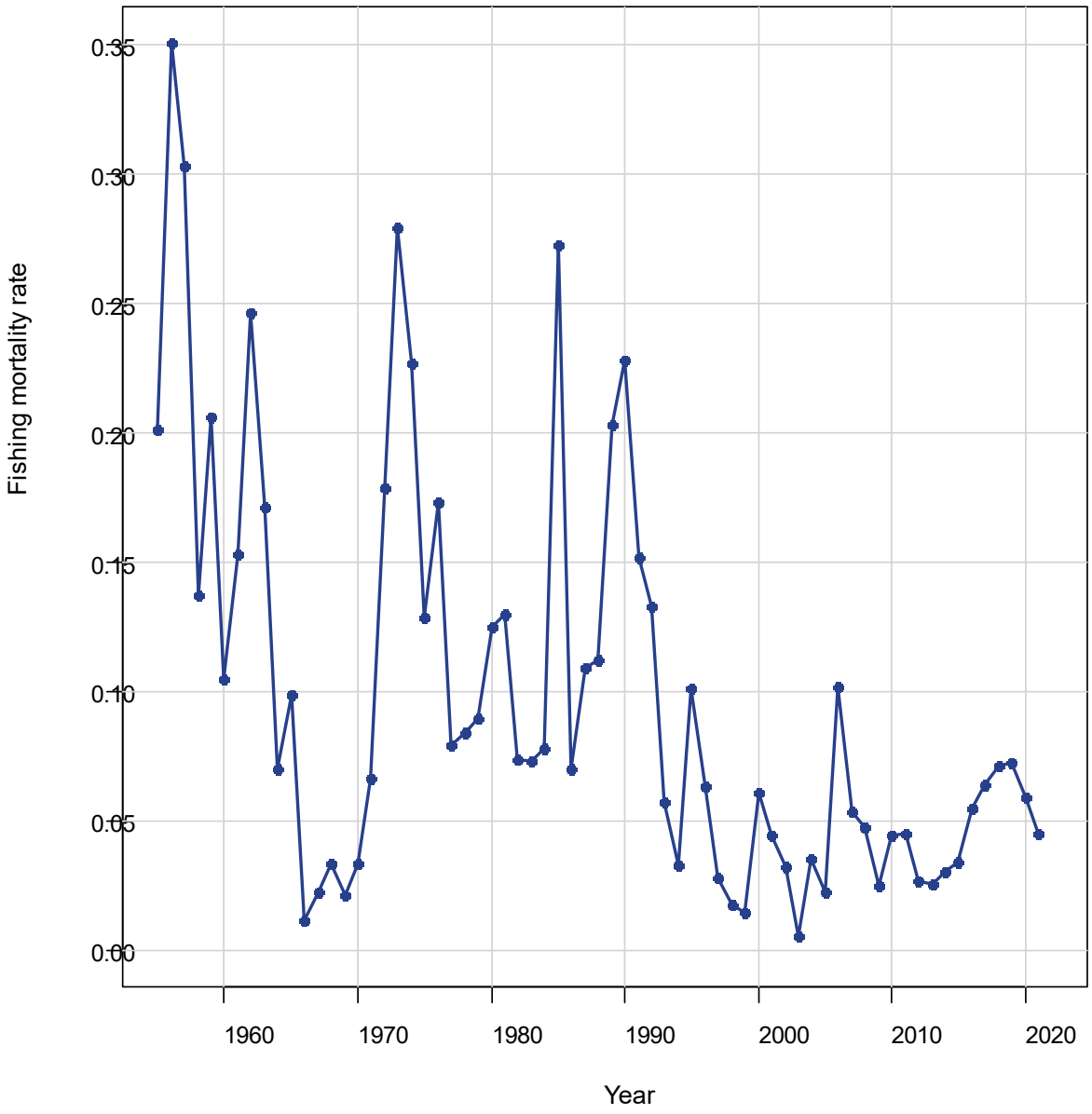


Figure A32. The fishing mortality rate for the commercial reduction north fleet for 1955-2021.

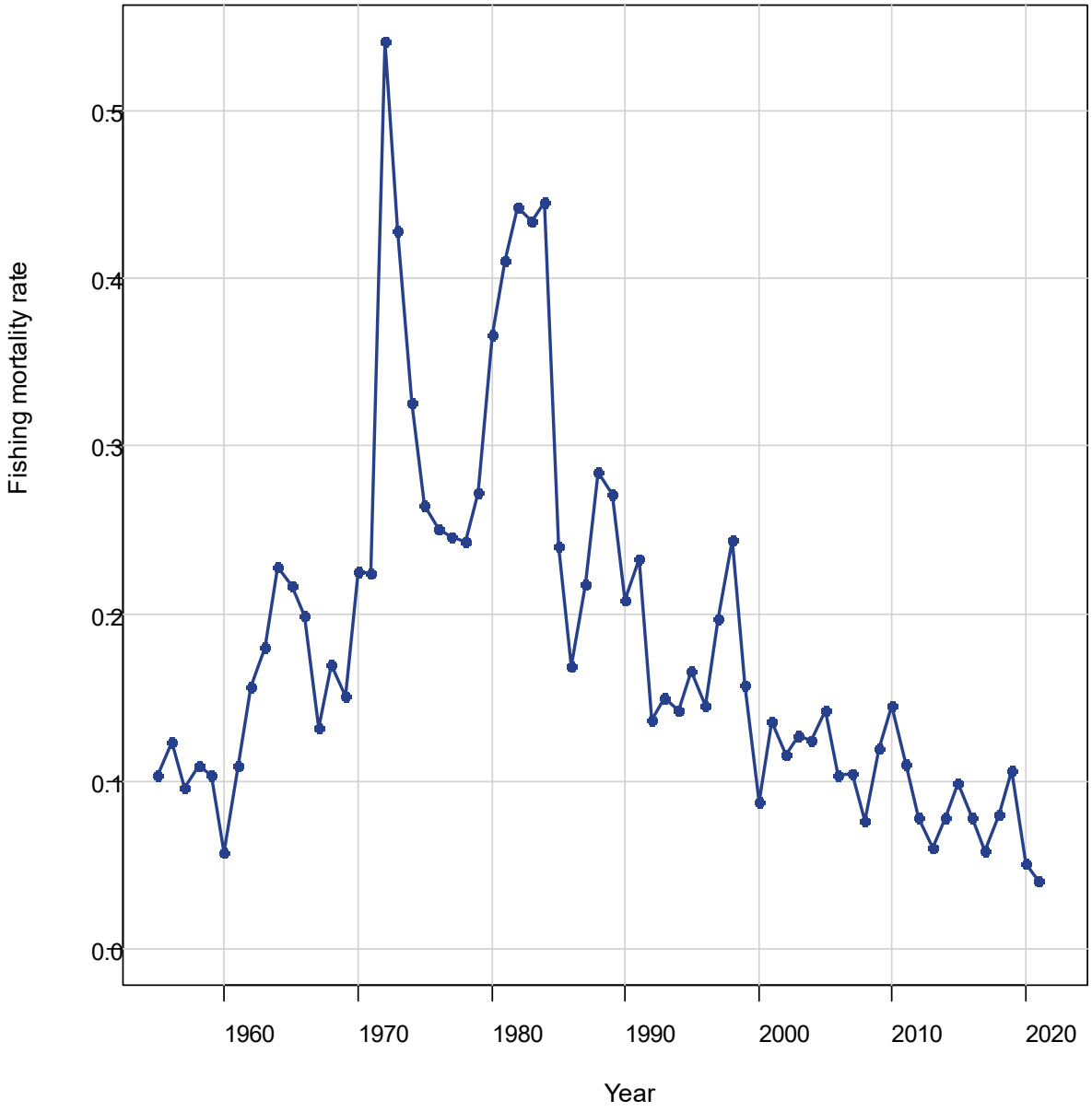


Figure A33. The fishing mortality rate for the commercial reduction south fleet for 1955-2021.

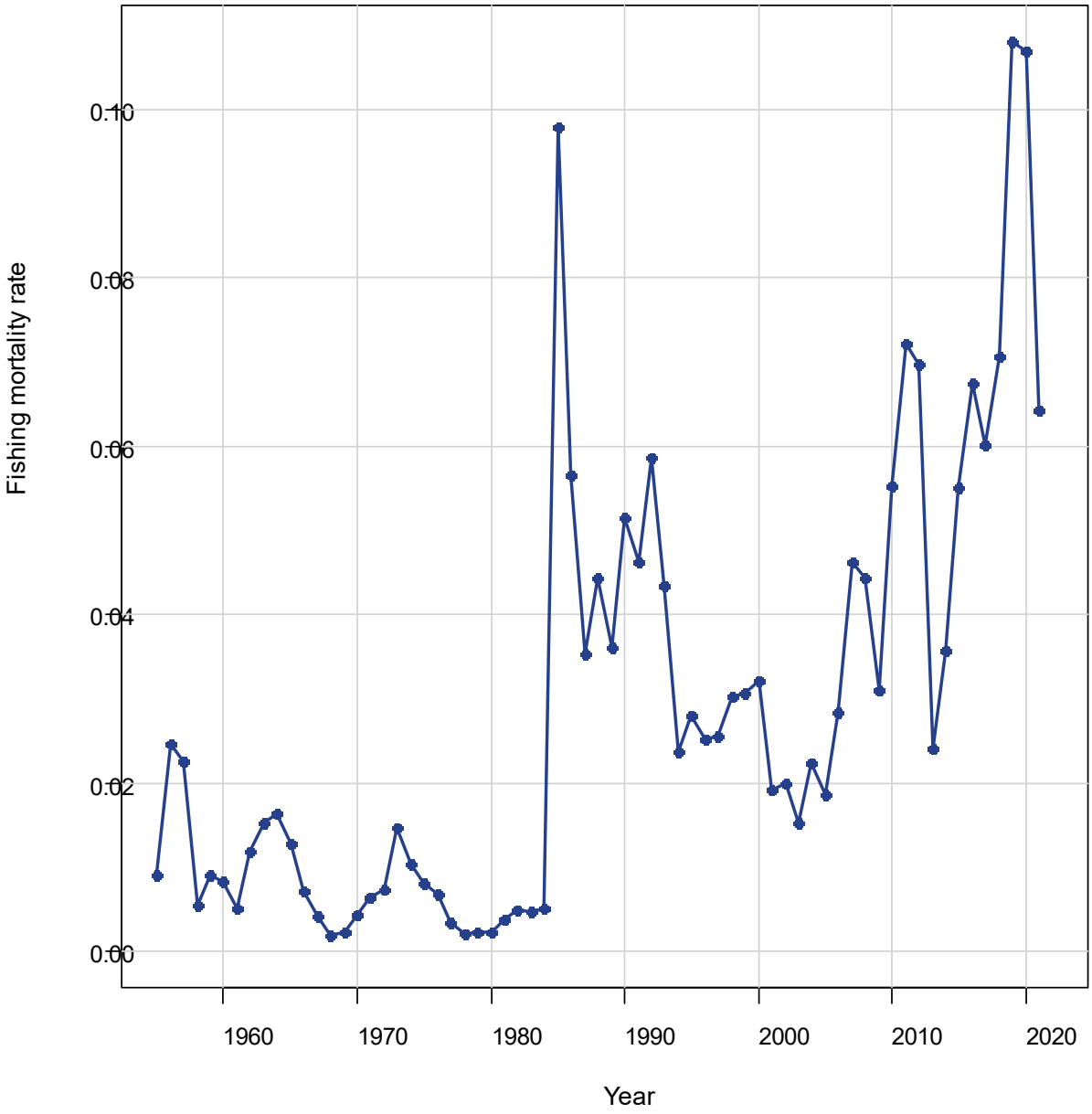


Figure A34. The fishing mortality rate for the commercial bait north fleet for 1955-2021.

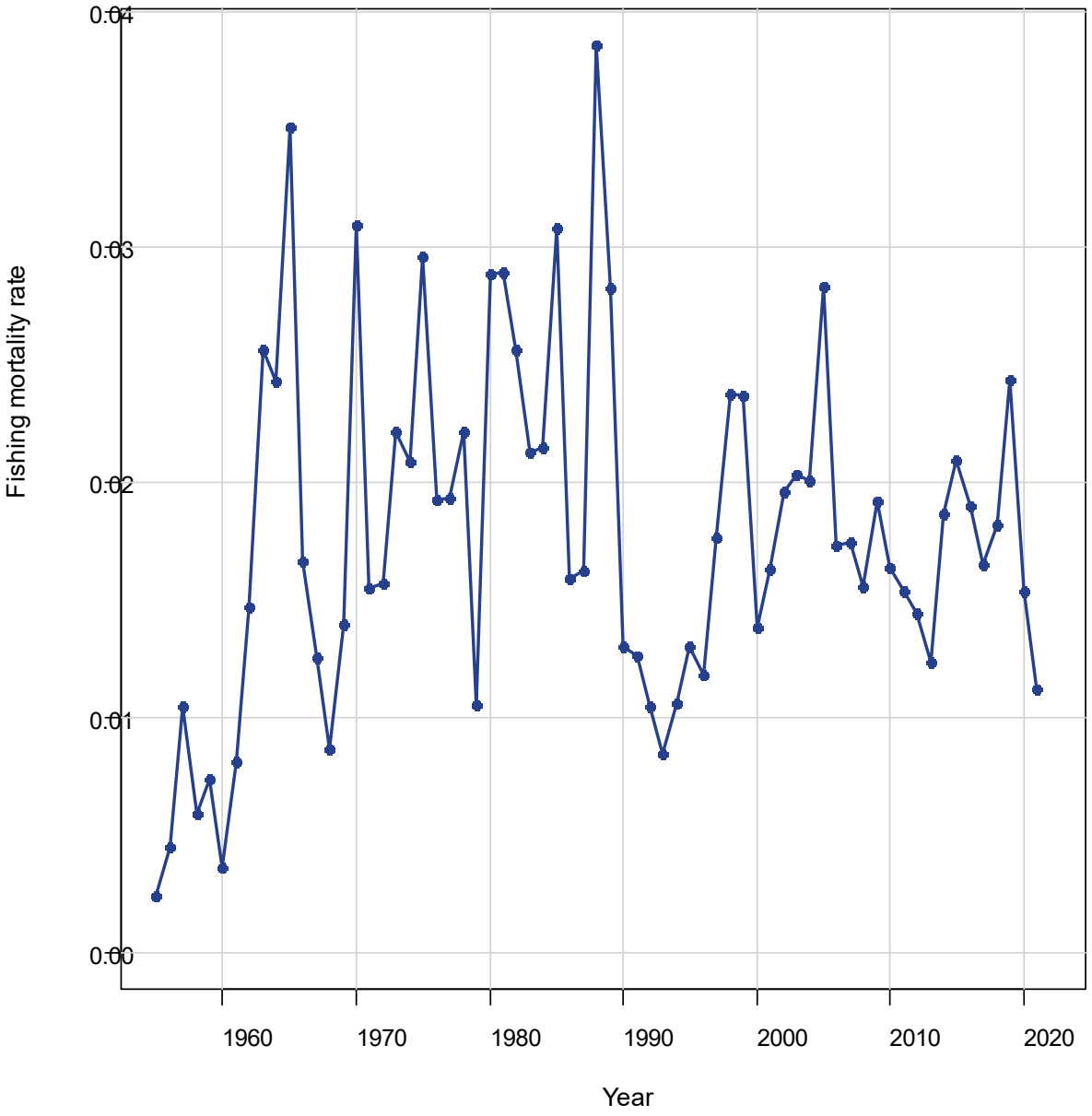


Figure A35. The fishing mortality rate for the commercial bait south fleet for 1955-2021.

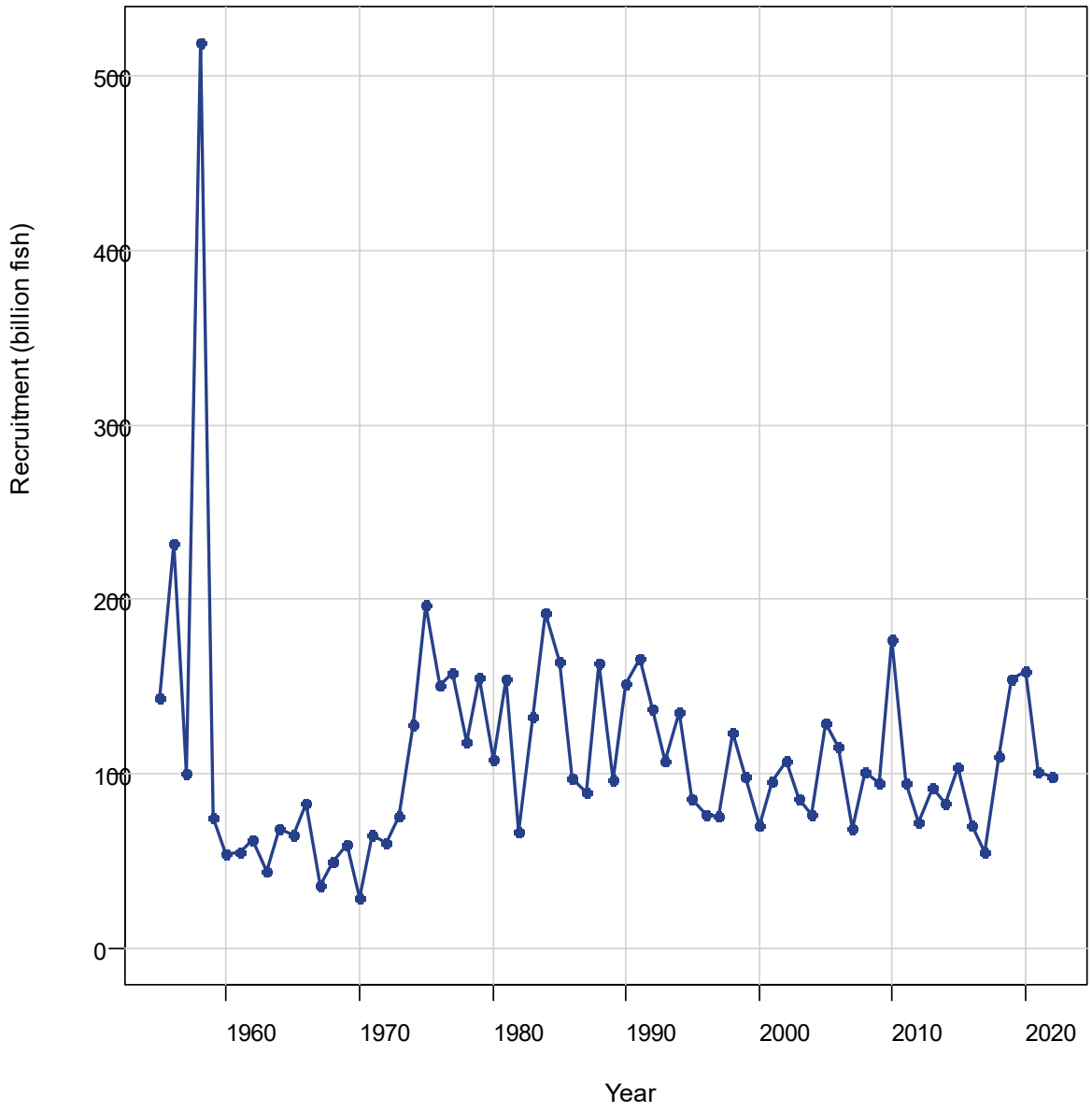


Figure A36. The estimated time series of recruitment for 1955-2021. The 2022 point is a projected recruitment point.

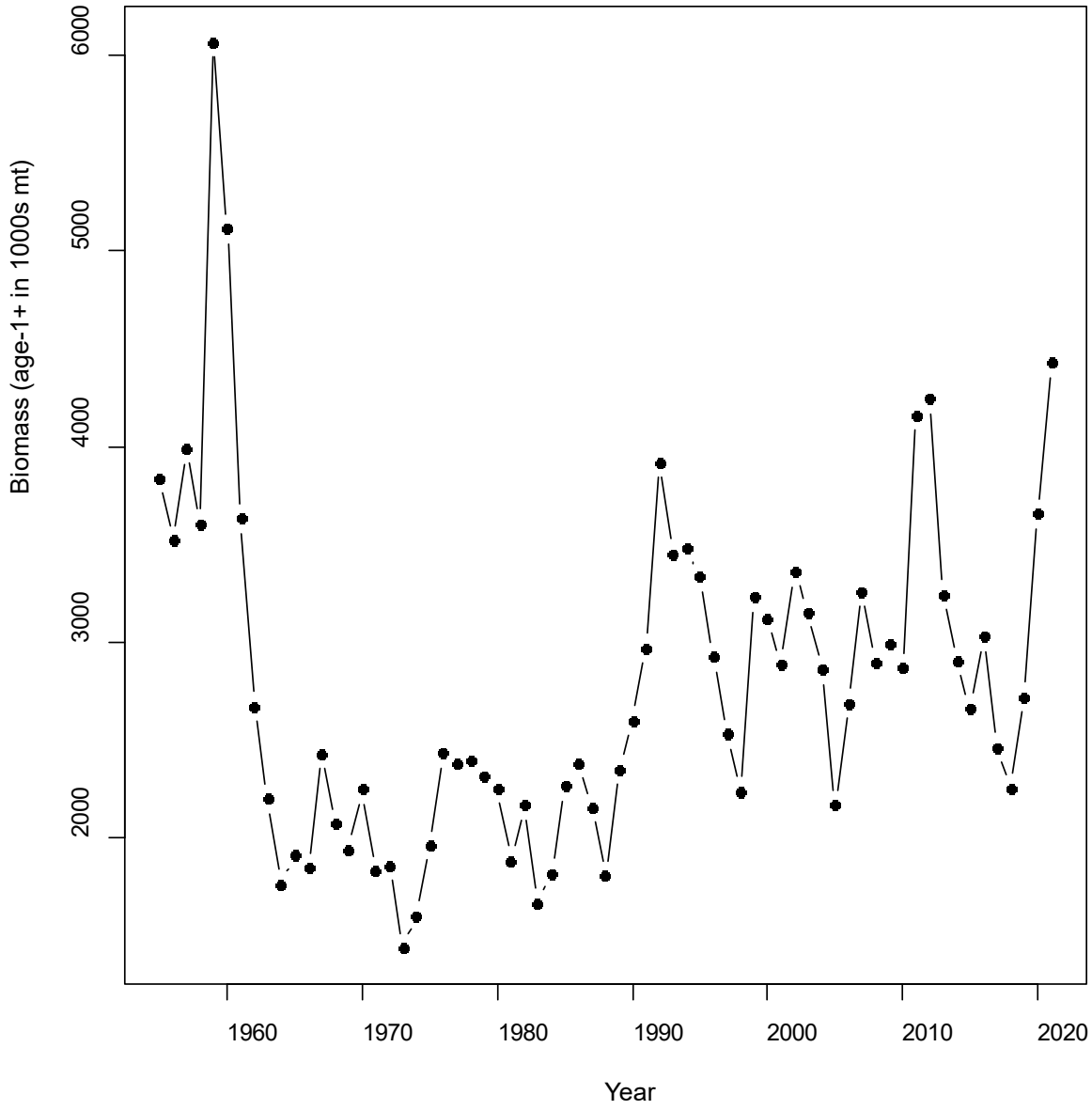


Figure A37. Age-1+ biomass in 1000s of mt for 1955-2021.

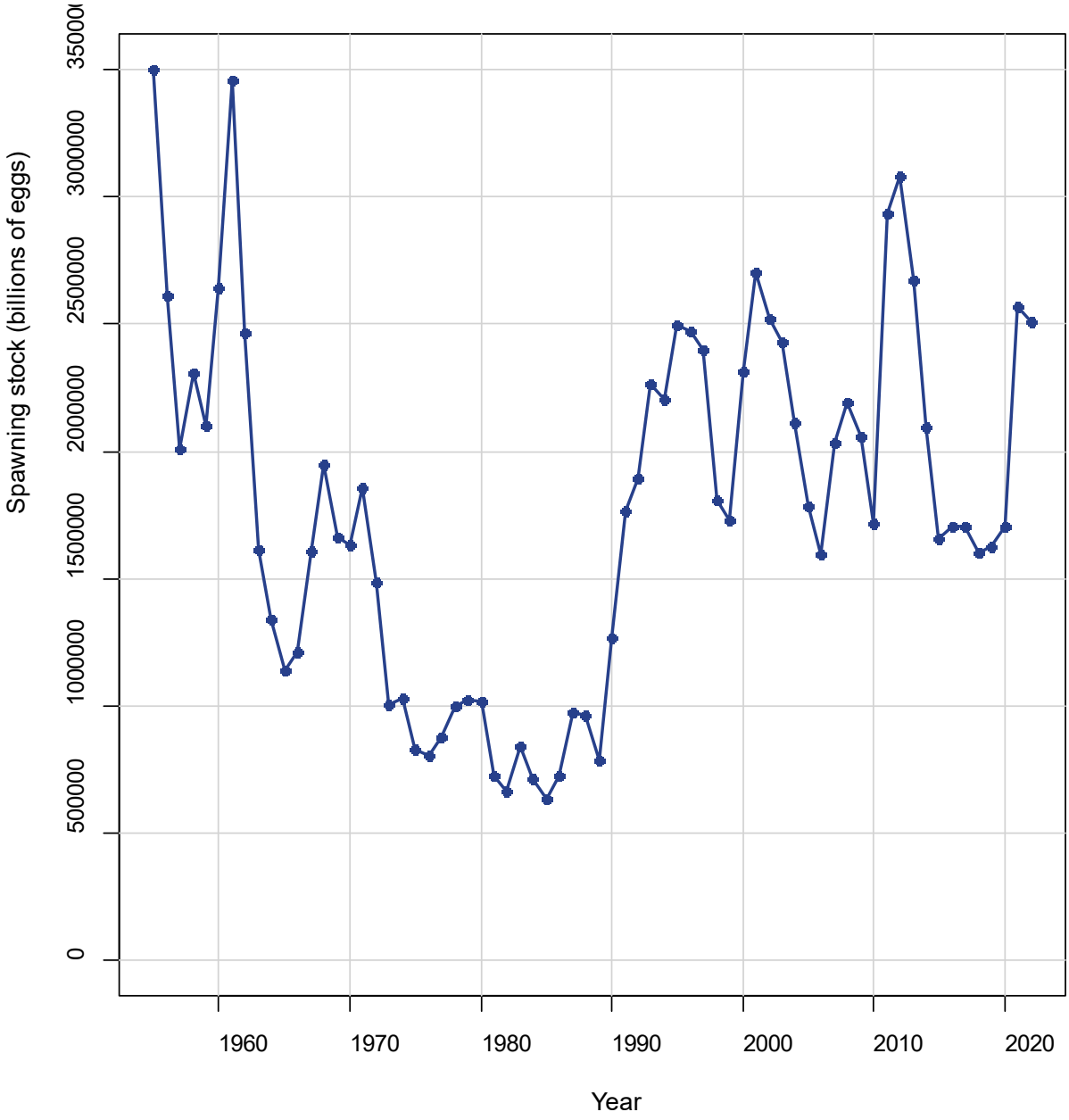


Figure A38. Fecundity in billions of ova for 1955-2022. The 2022 value is a projection value.

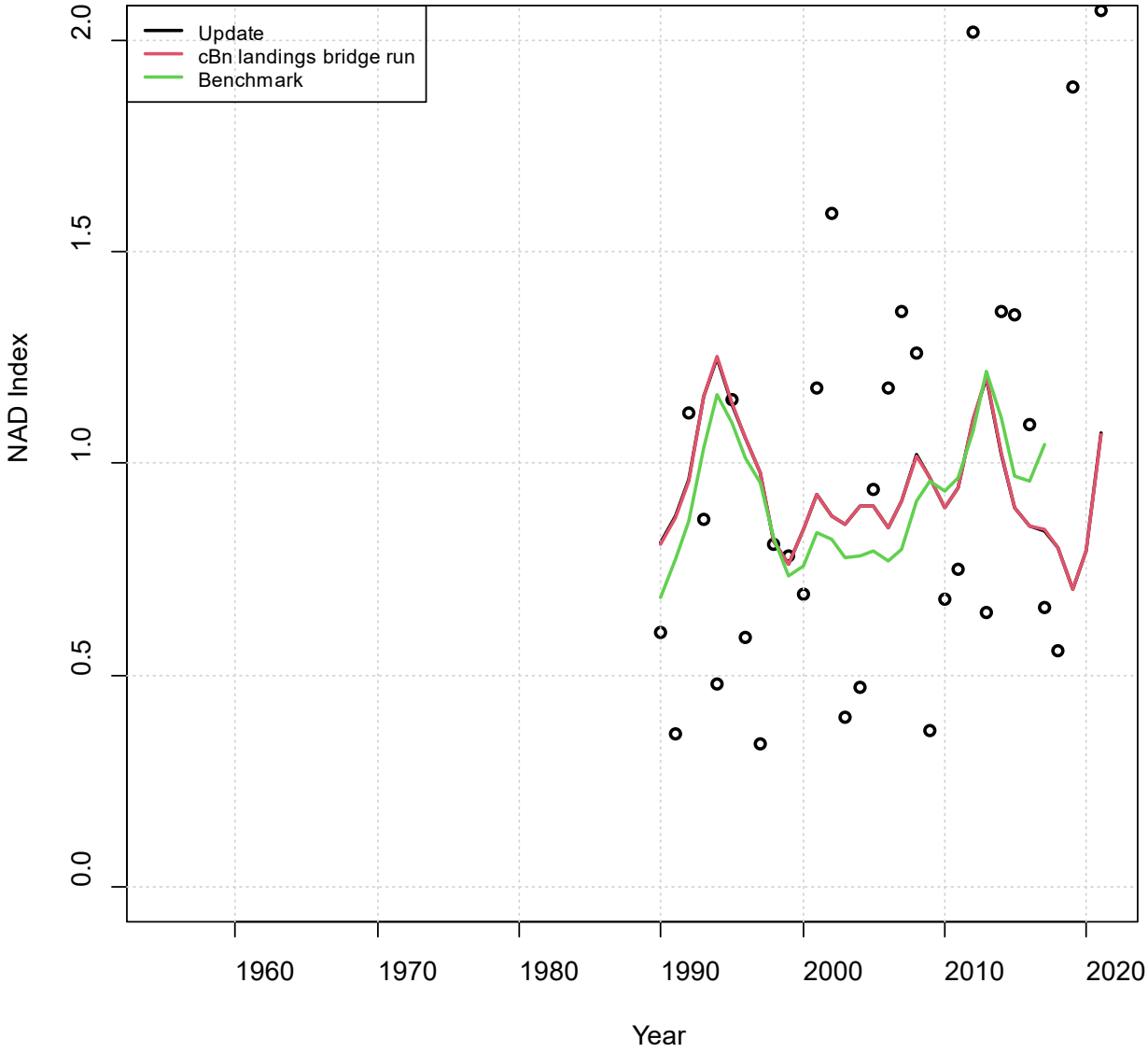


Figure A39. Fit to the observed (open circles) NAD index for the base run for this update assessment, the commercial bait north landings from the last assessment, and the last benchmark assessment.

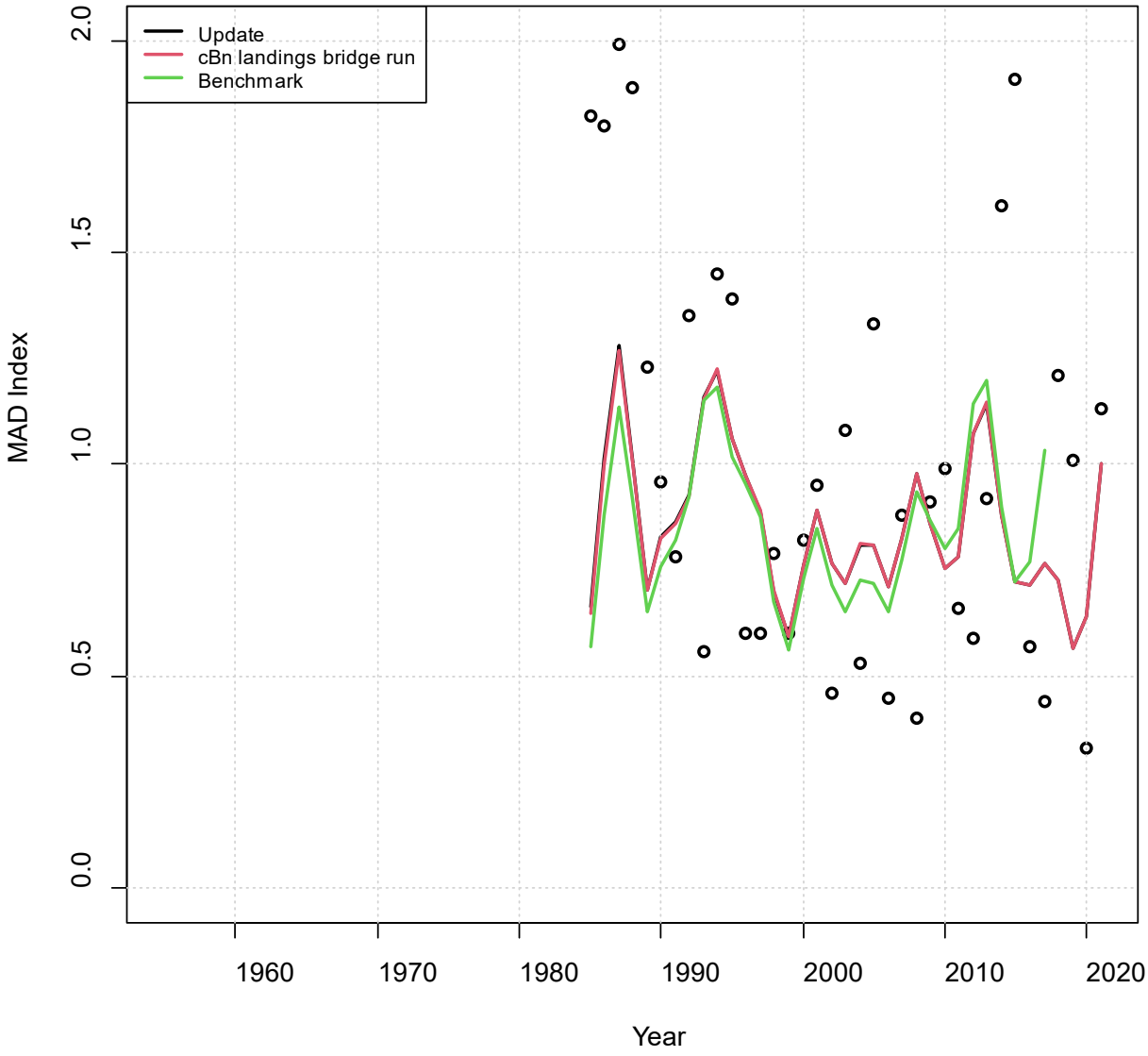


Figure A40. **Fit to the observed (open circles) MAD index for the base run for this update assessment, the commercial bait north landings from the last assessment, and the last benchmark assessment.**

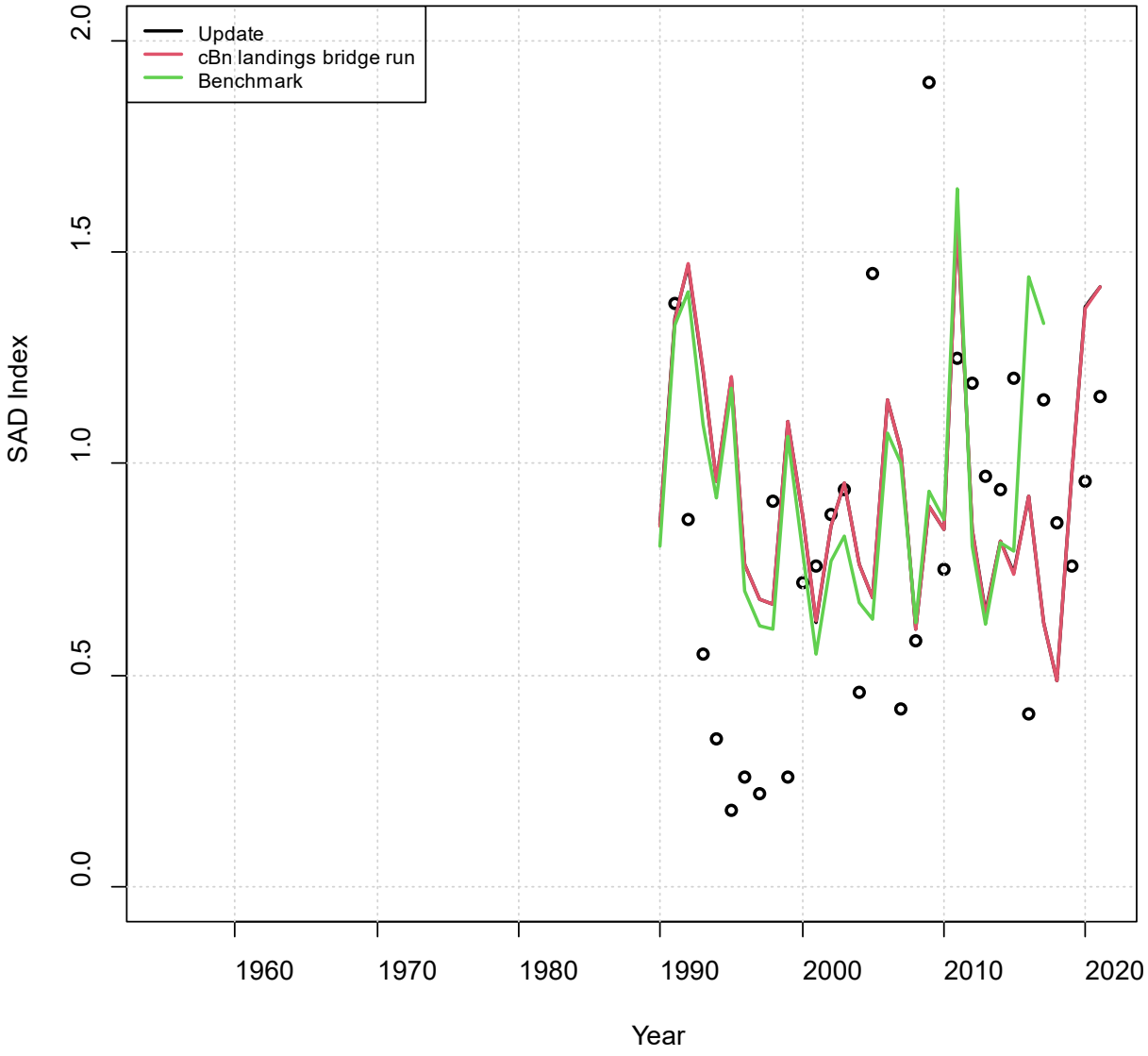


Figure A41. **Fit to the observed (open circles) SAD index for the base run for this update assessment, the commercial bait north landings from the last assessment, and the last benchmark assessment.**

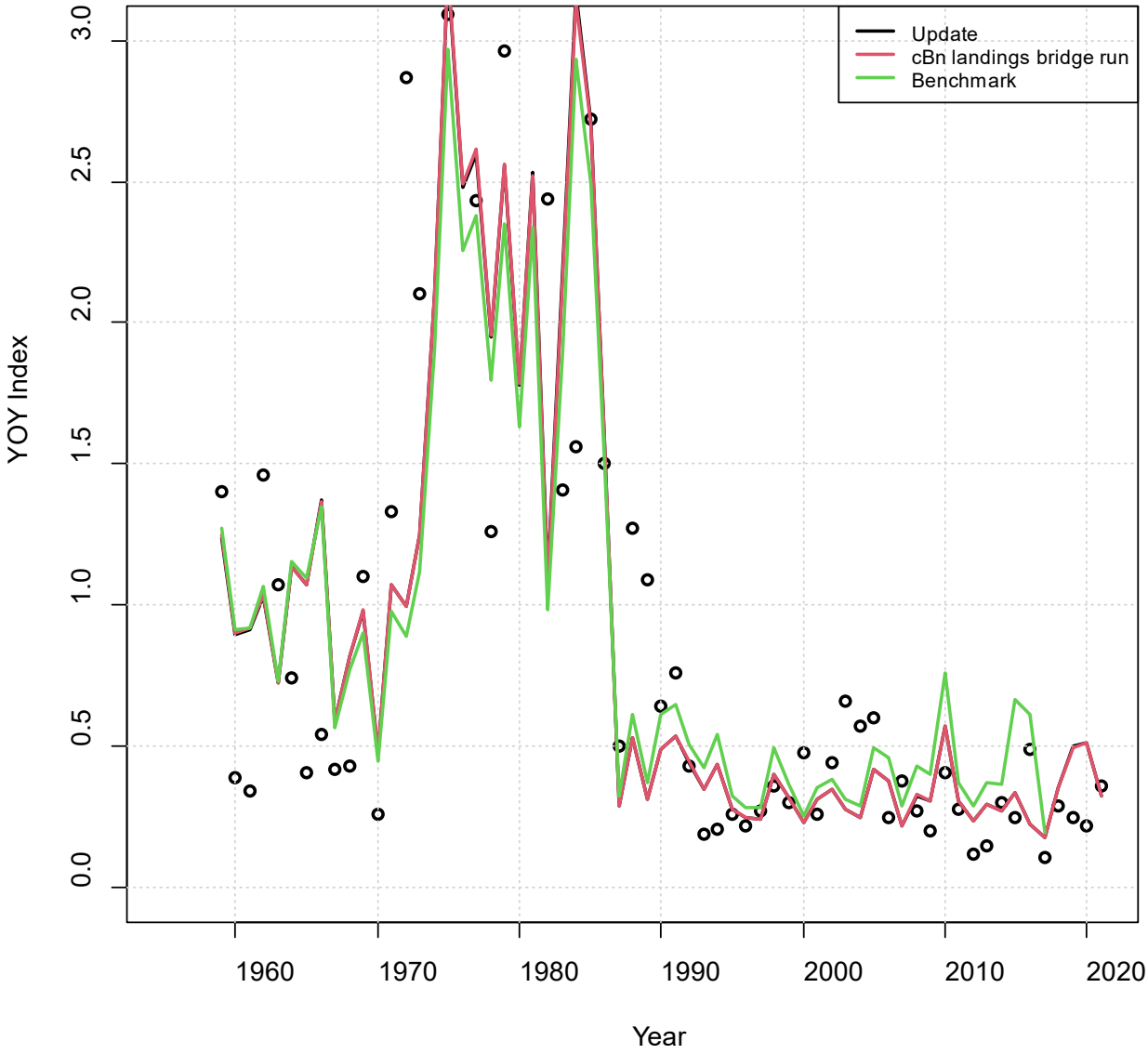


Figure A42. **Fit to the observed (open circles) recruitment index for the base run for this update assessment, the commercial bait north landings from the last assessment, and the last benchmark assessment.**

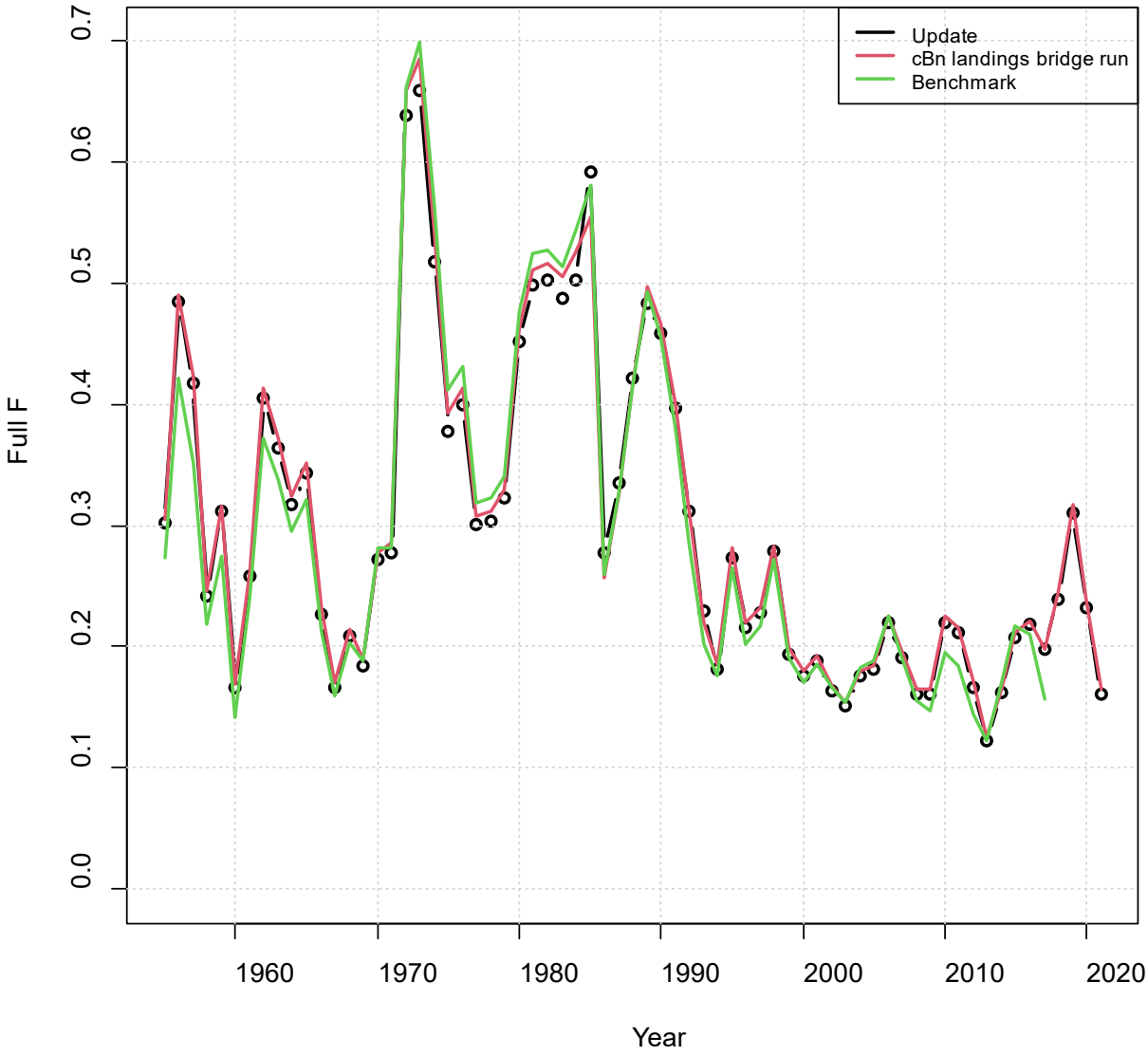


Figure A43. Estimates of the full fishing mortality rate for the base run for this update assessment, the commercial bait north landings from the last assessment, and the last benchmark assessment.

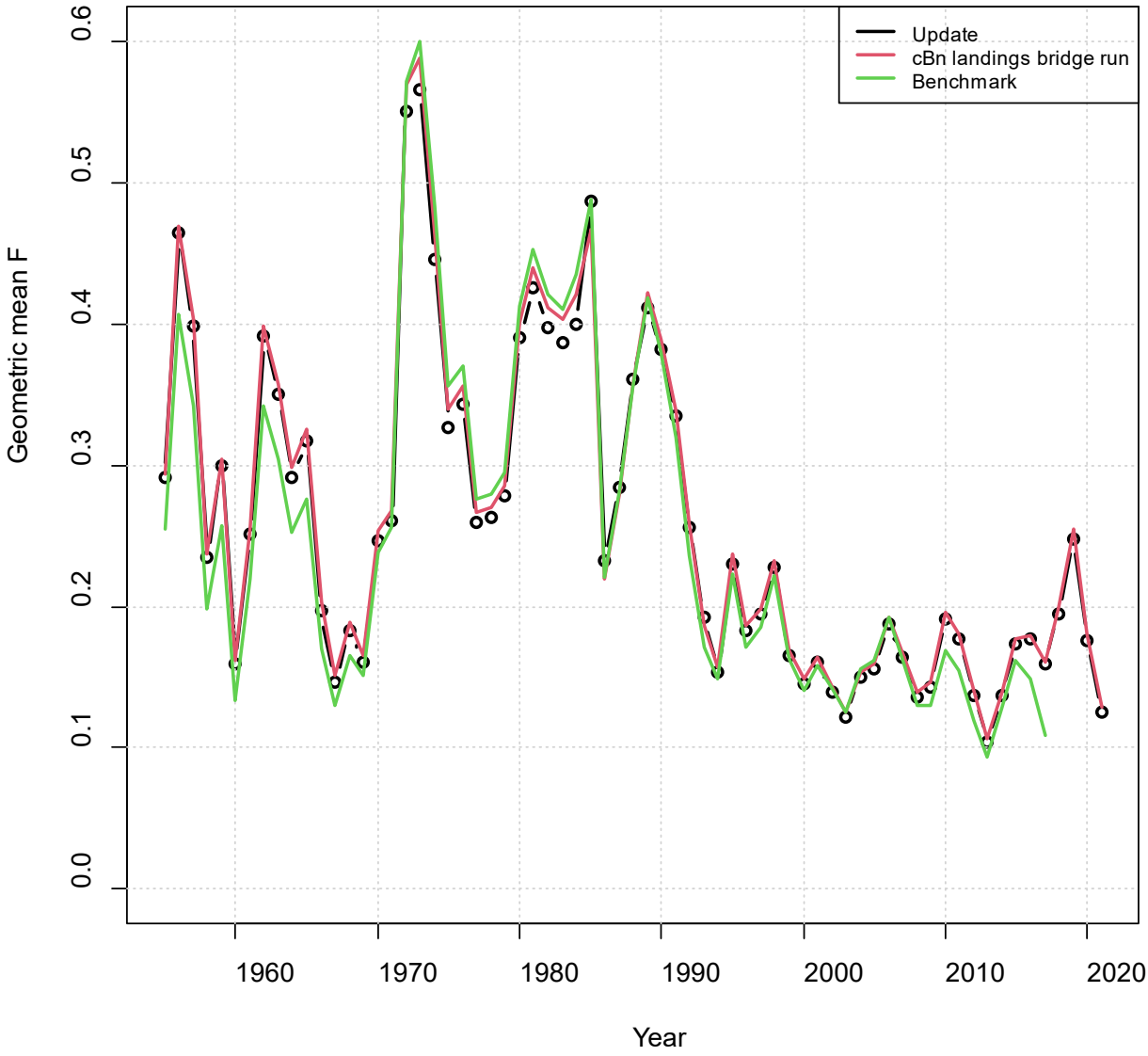


Figure A44. **Estimates of the geometric mean fishing mortality rate for ages-2 to -4 for the base run for this update assessment, the commercial bait north landings from the last assessment, and the last benchmark assessment.**

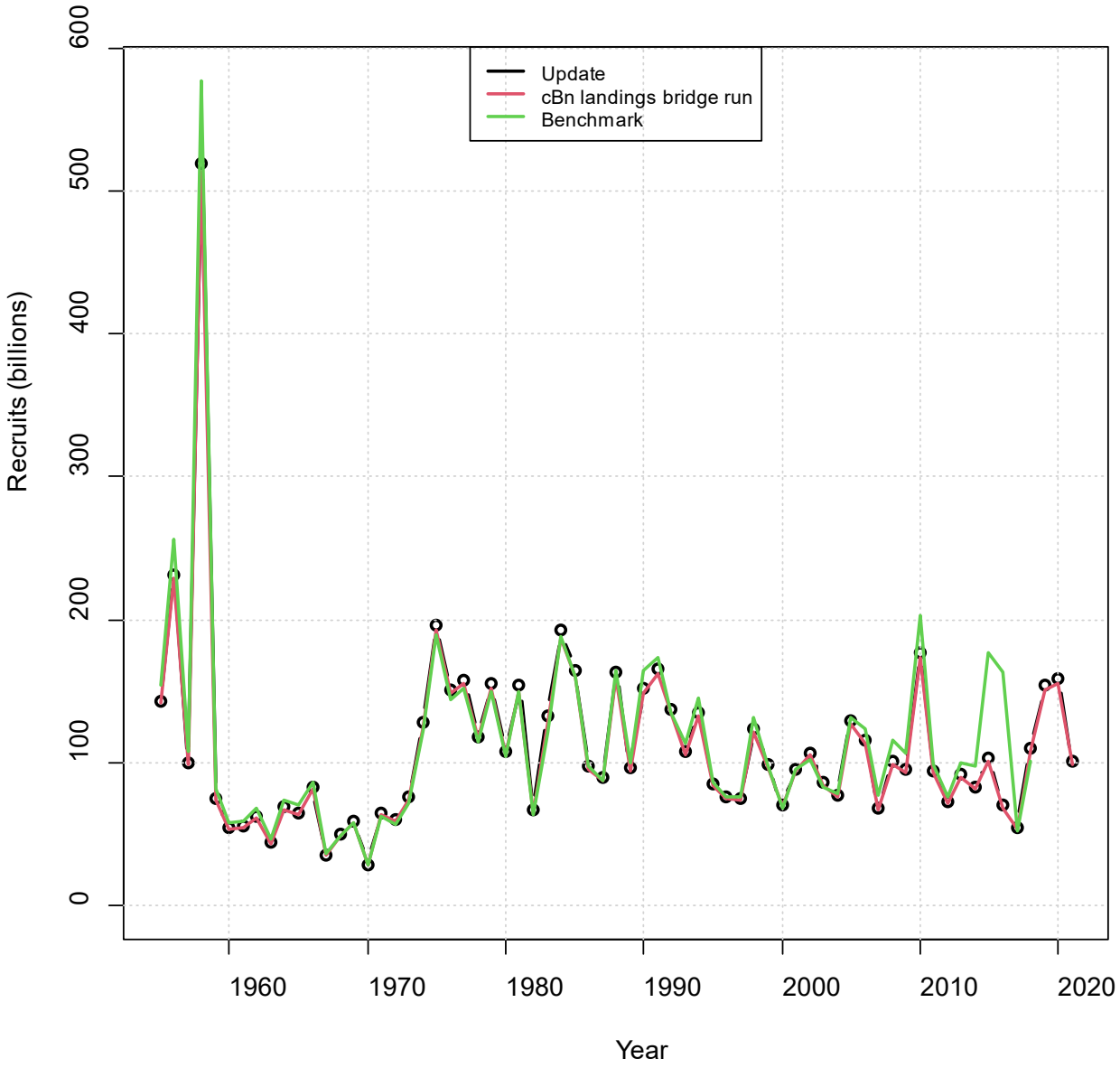


Figure A45. Estimates of the recruitment time series for the base run for this update assessment, the commercial bait north landings from the last assessment, and the last benchmark assessment.

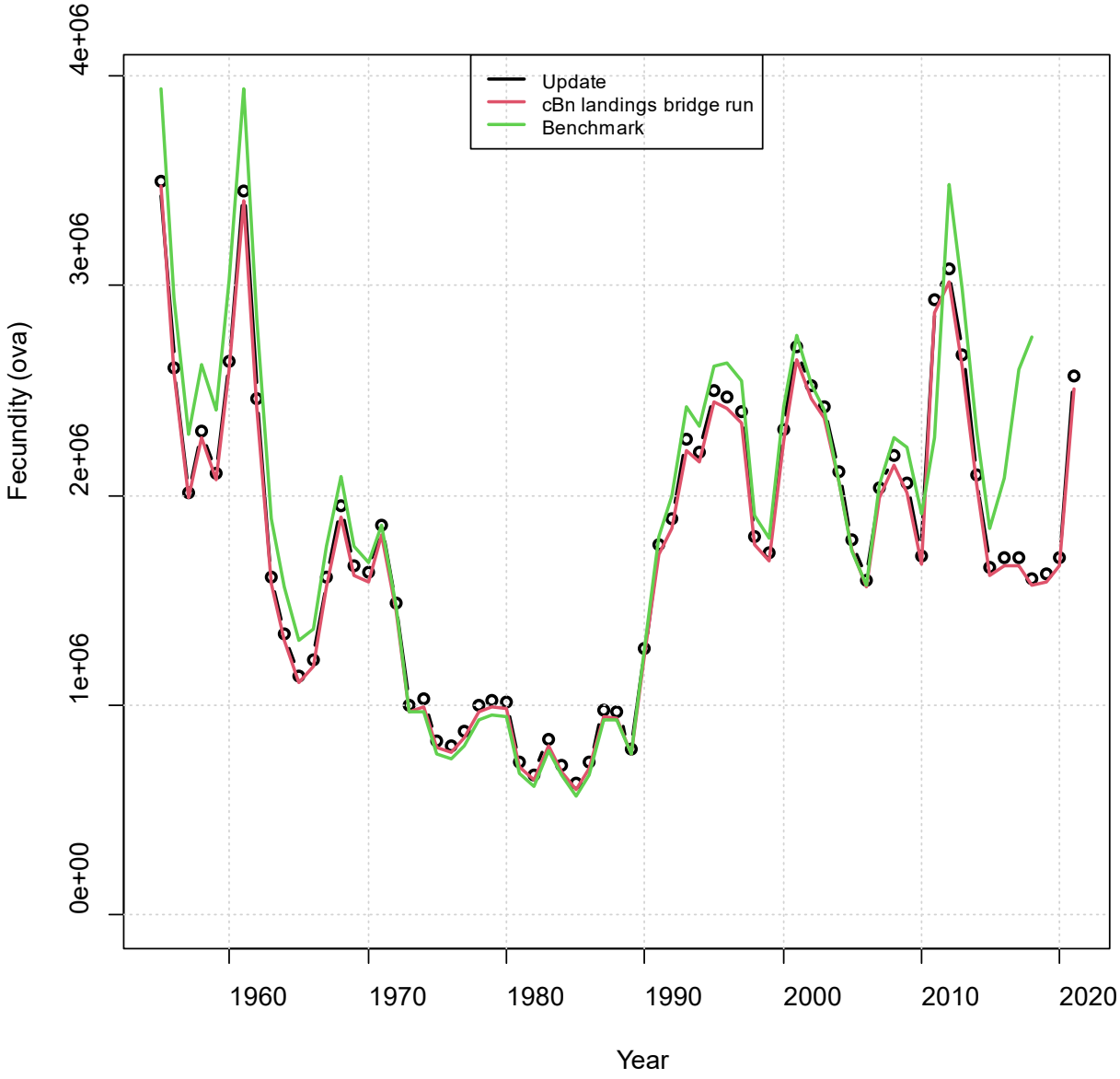


Figure A46. Estimates of the fecundity for the base run for this update assessment, the commercial bait north landings from the last assessment, and the last benchmark assessment.

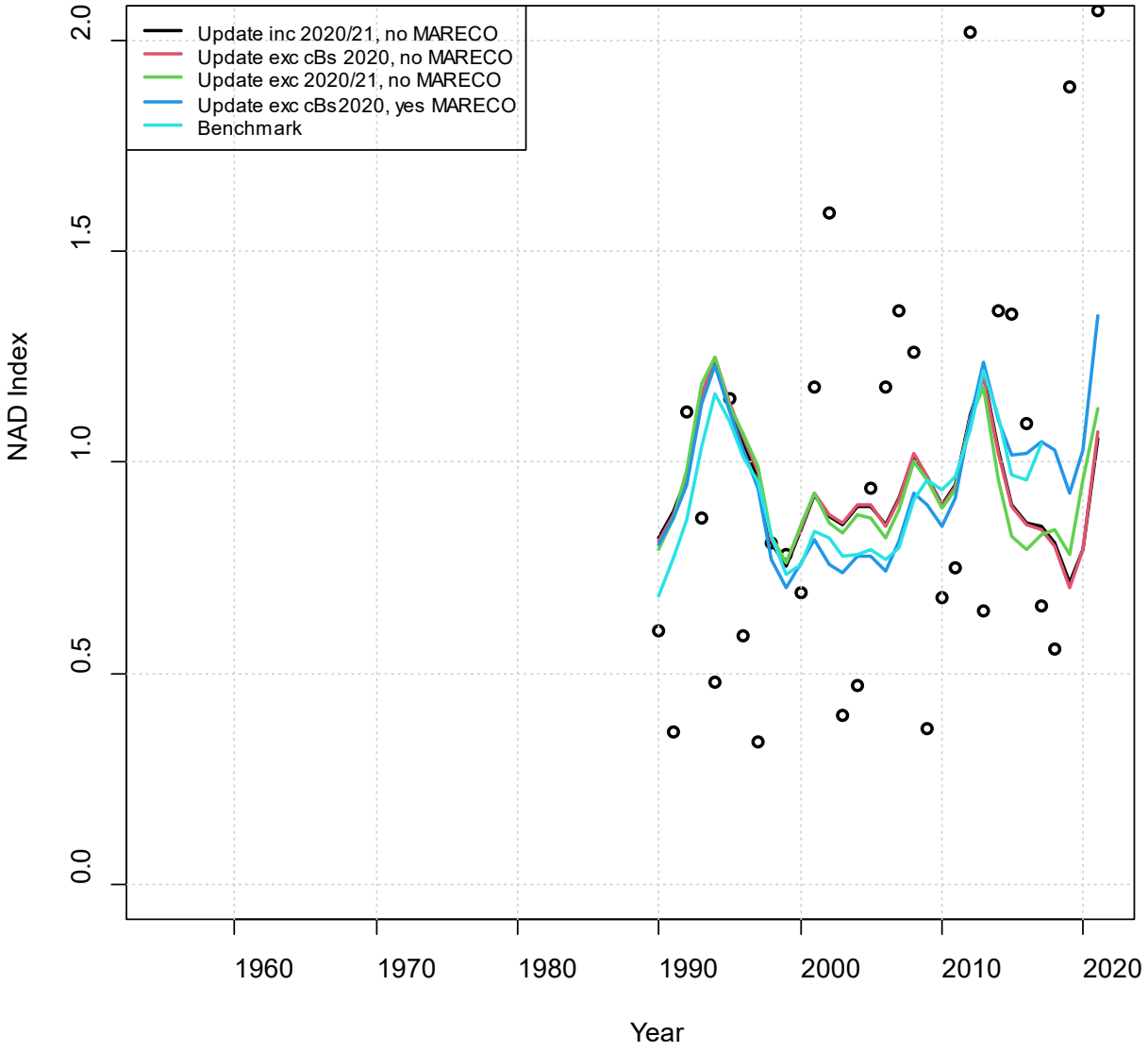


Figure A47. **Fit to the observed (open circles) NAD index for the base run (labeled Update exc cBs 2020, no MARECO) for a series of runs related to the inclusion of the 2020 and 2021 data. The runs either included or excluded the 2020 and 2021 data, excluded the commercial bait south (cBs) data for 2020, or included or excluded the ichthyoplankton index called the MARECO index.**

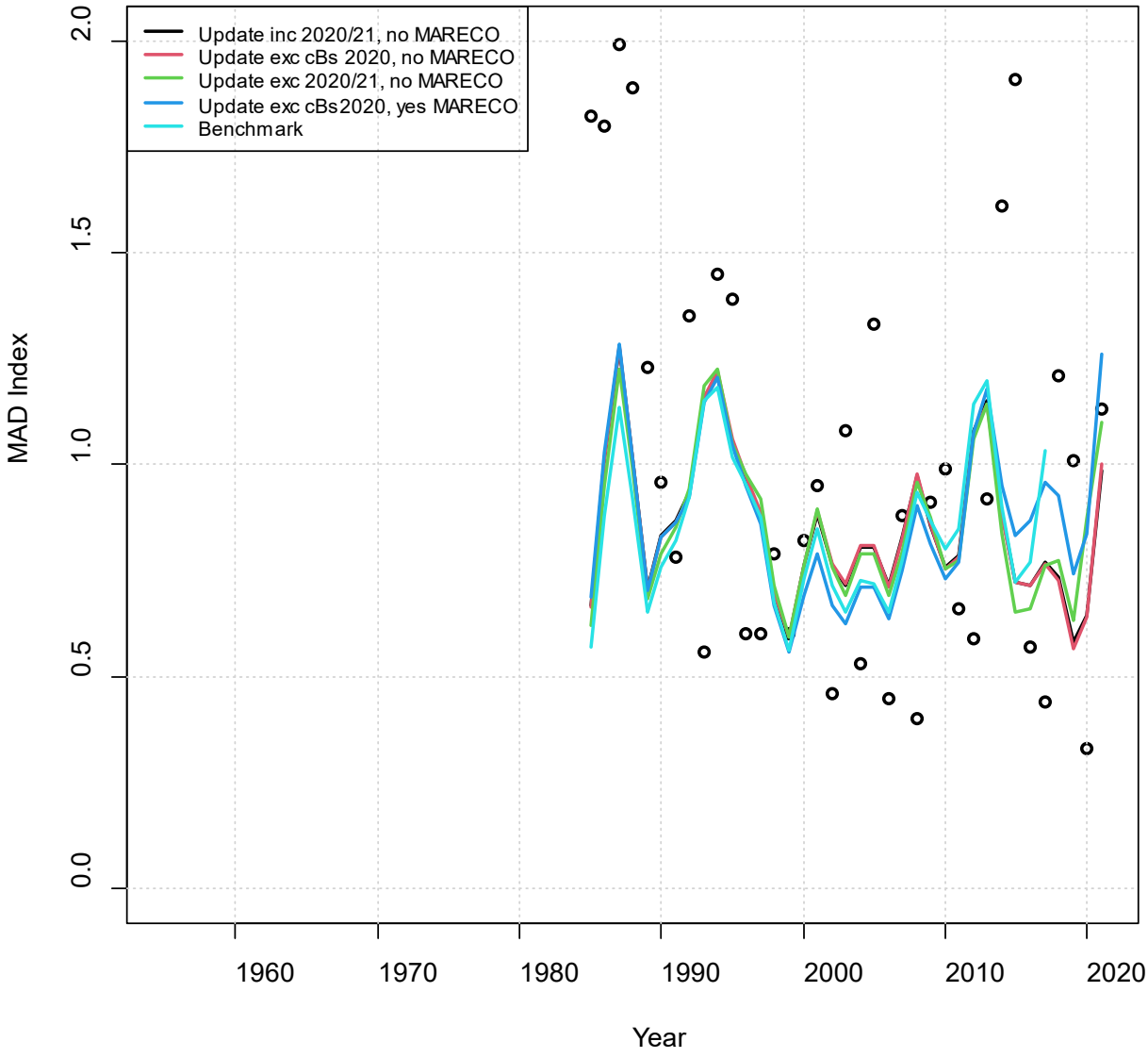


Figure A48. **Fit to the observed (open circles) MAD index for the base run (labeled Update exc cBs 2020, no MARECO) for a series of runs related to the inclusion of the 2020 and 2021 data. The runs either included or excluded the 2020 and 2021 data, excluded the commercial bait south (cBs) data for 2020, or included or excluded the ichthyoplankton index called the MARECO index.**

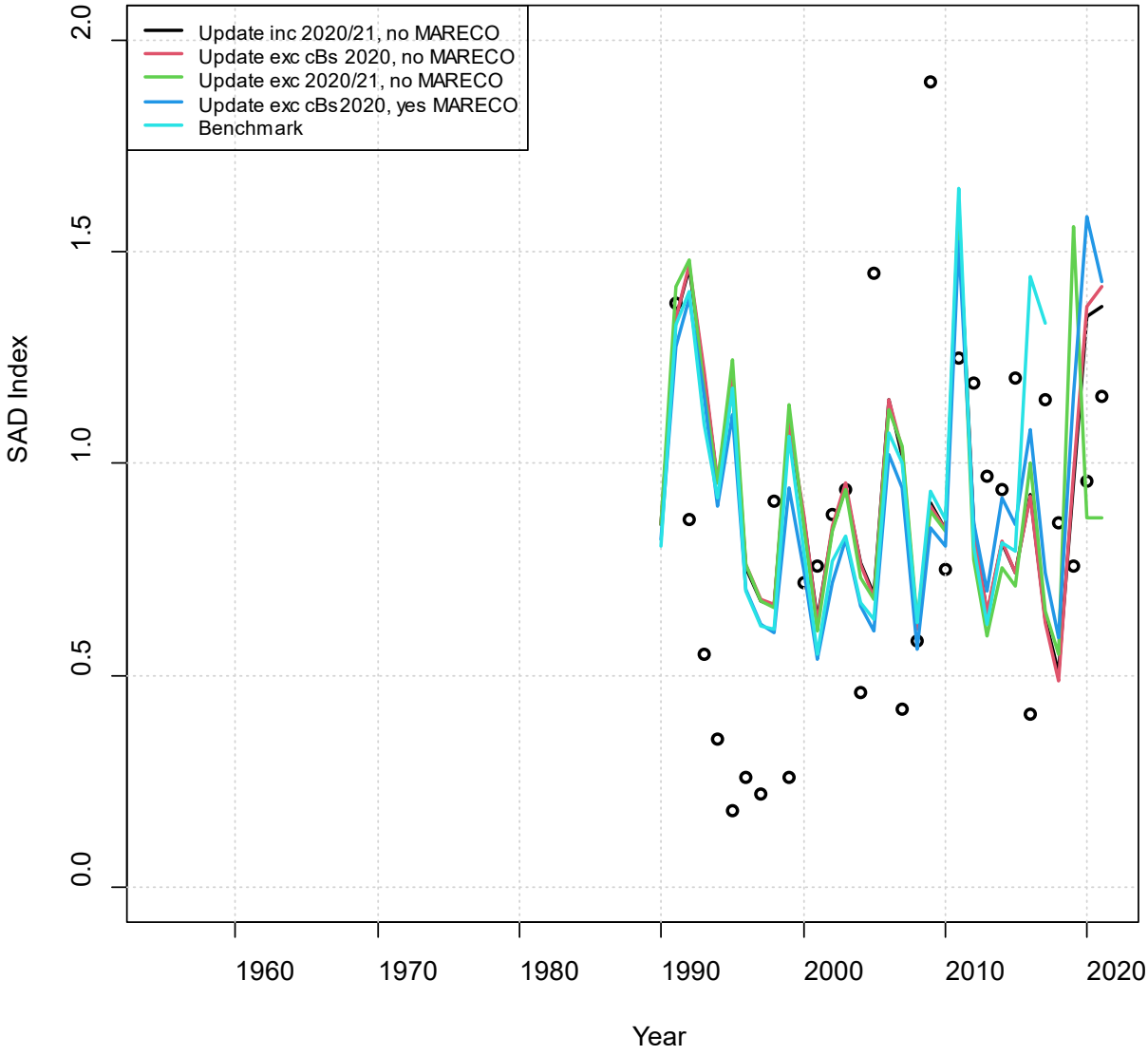


Figure A49. **Fit to the observed (open circles) SAD index for the base run (labeled Update exc cBs 2020, no MARECO) for a series of runs related to the inclusion of the 2020 and 2021 data. The runs either included or excluded the 2020 and 2021 data, excluded the commercial bait south (cBs) data for 2020, or included or excluded the ichthyoplankton index called the MARECO index.**

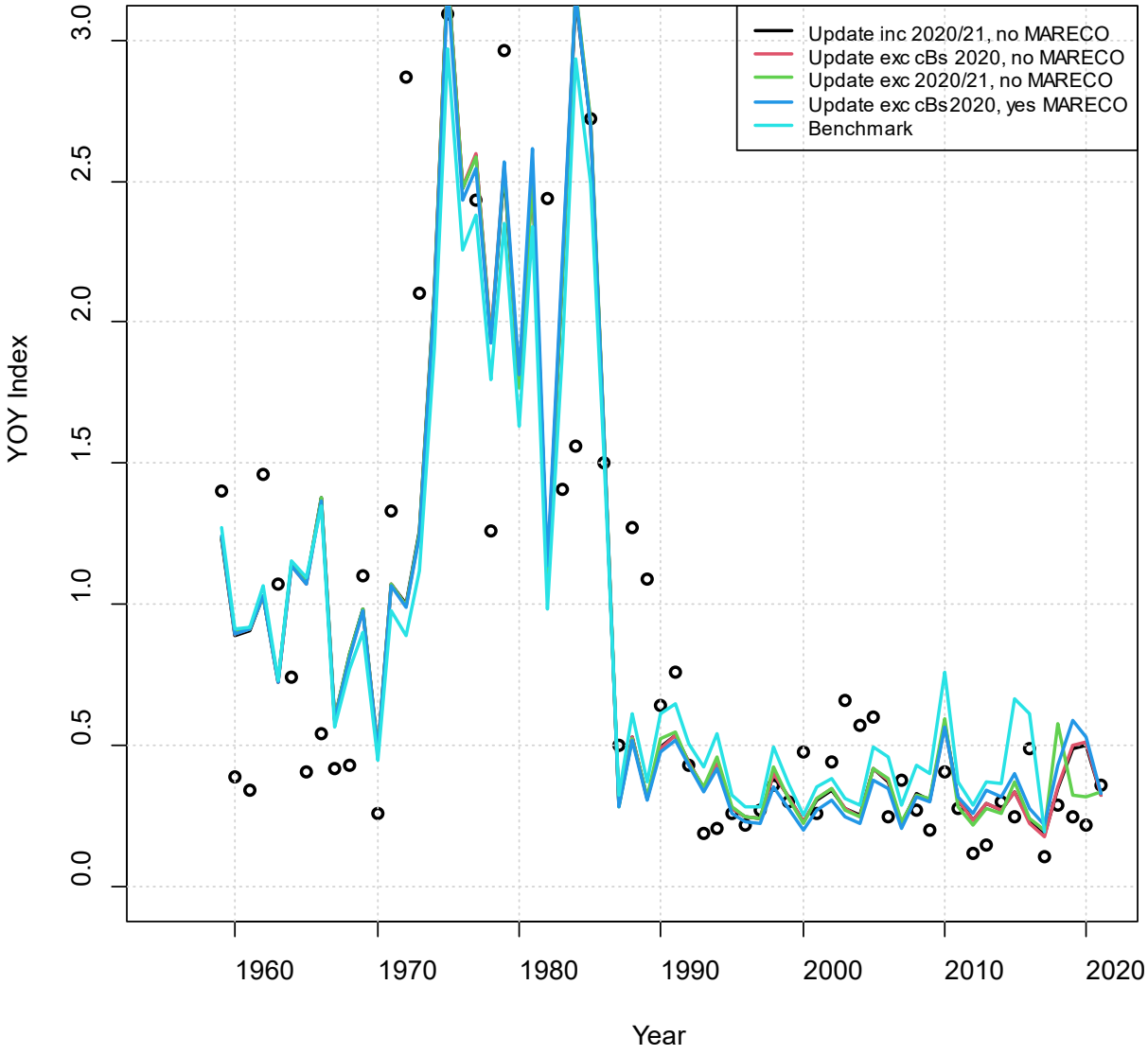


Figure A50. **Fit to the observed (open circles) recruitment index for the base run (labeled Update exc cBs 2020, no MARECO) for a series of runs related to the inclusion of the 2020 and 2021 data. The runs either included or excluded the 2020 and 2021 data, excluded the commercial bait south (cBs) data for 2020, or included or excluded the ichthyoplankton index called the MARECO index.**

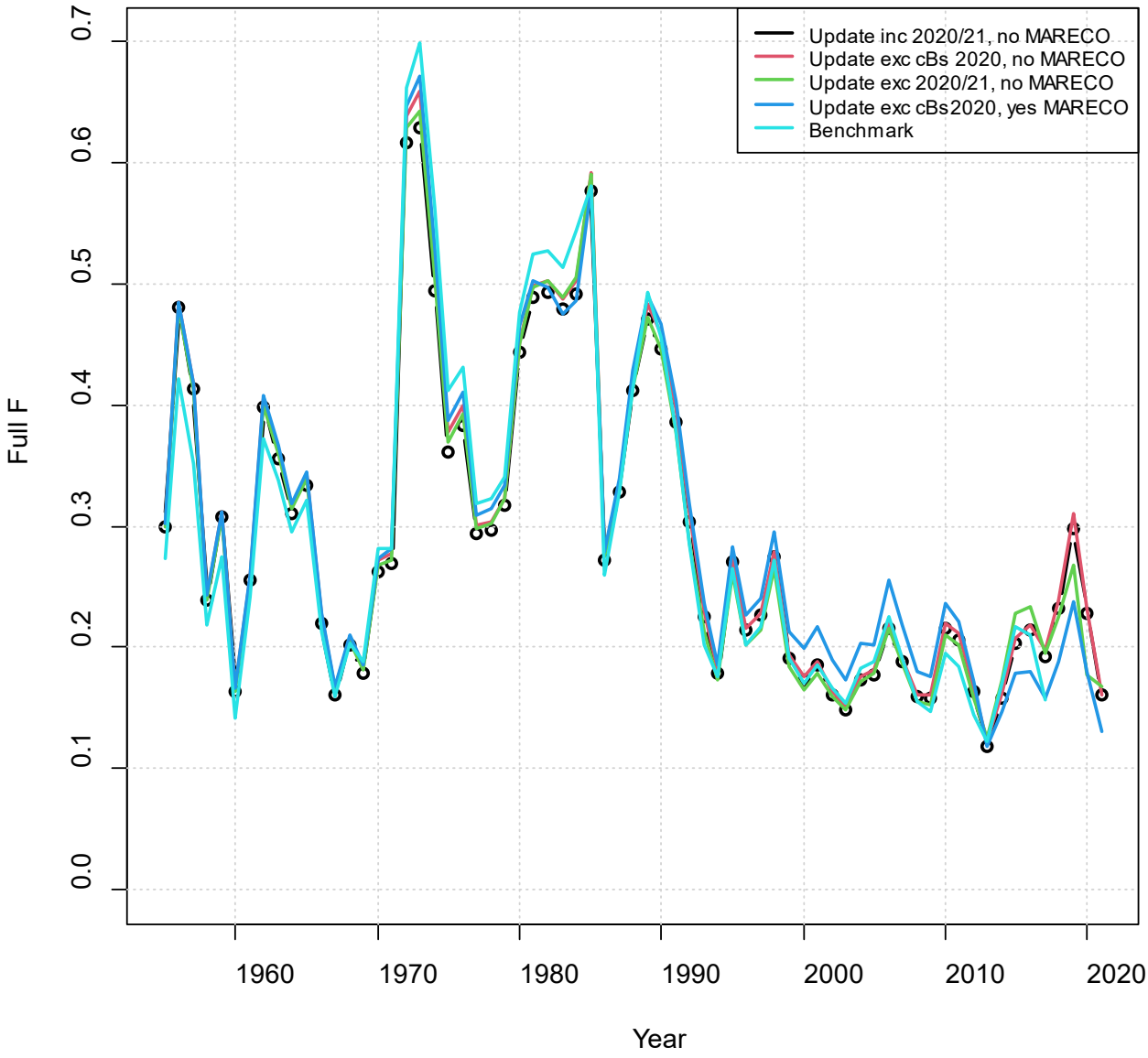


Figure A51. **Estimates of the full fishing mortality rate for the base run for the base run (labeled Update exc cBs 2020, no MARECO) for a series of runs related to the inclusion of the 2020 and 2021 data. The runs either included or excluded the 2020 and 2021 data, excluded the commercial bait south (cBs) data for 2020, or included or excluded the ichthyoplankton index called the MARECO index.**

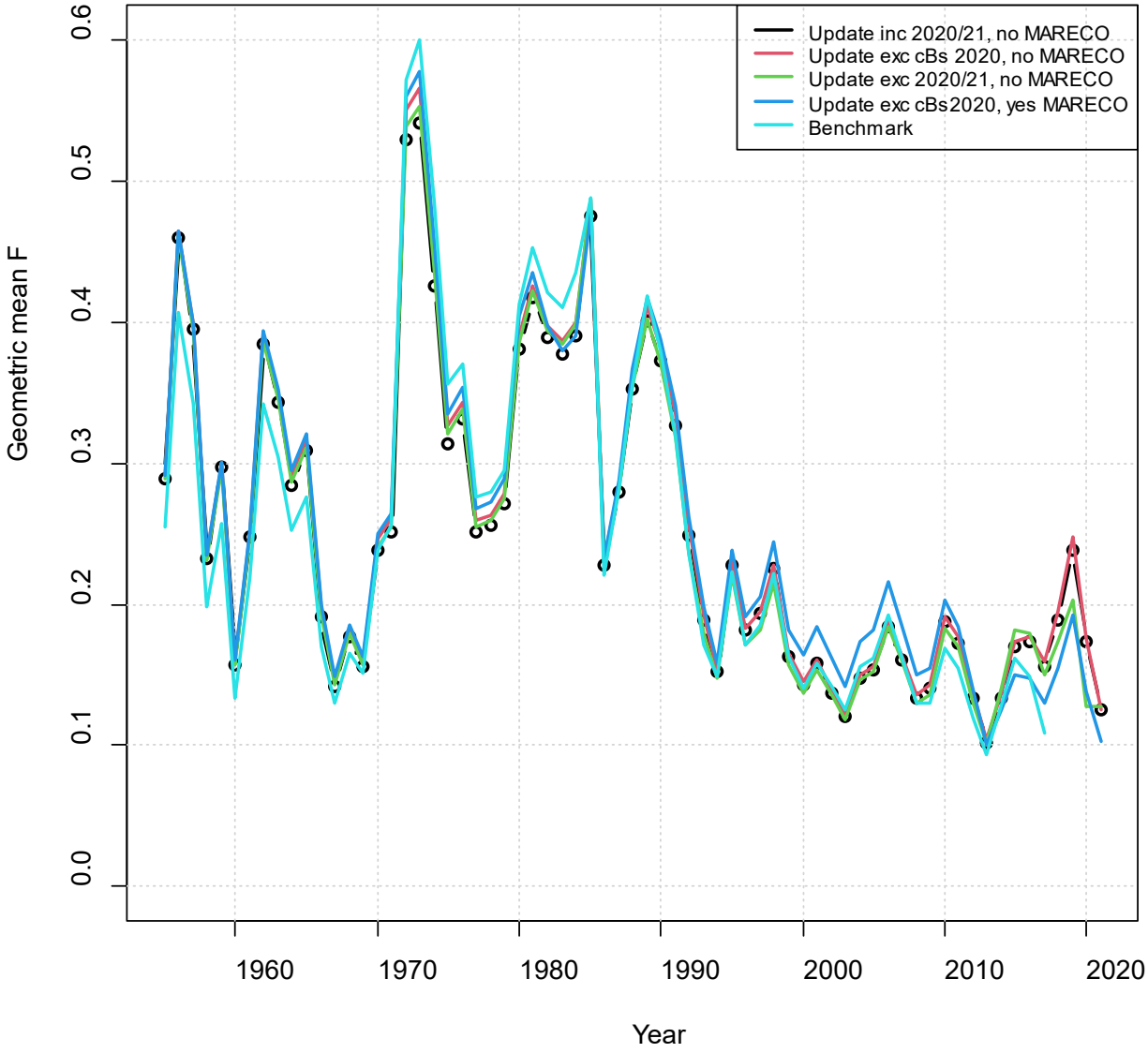


Figure A52. **Estimates of the geometric mean fishing mortality rate for ages-2 to -4 for the base run (labeled Update exc cBs 2020, no MARECO) for a series of runs related to the inclusion of the 2020 and 2021 data. The runs either included or excluded the 2020 and 2021 data, excluded the commercial bait south (cBs) data for 2020, or included or excluded the ichthyoplankton index called the MARECO index.**

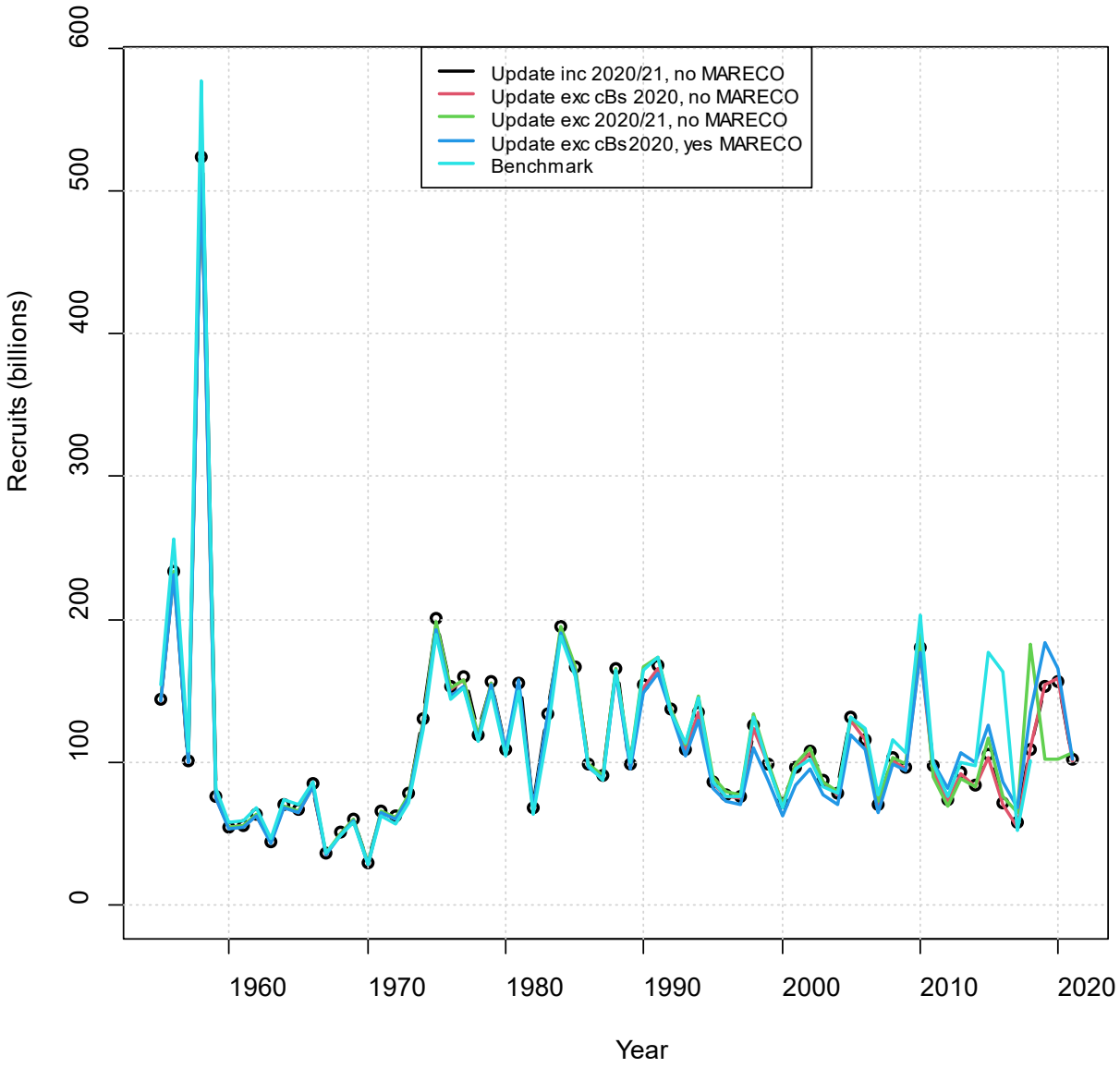


Figure A53. Estimates of the recruitment time series for the base run (labeled Update exc cBs 2020, no MARECO) for a series of runs related to the inclusion of the 2020 and 2021 data. The runs either included or excluded the 2020 and 2021 data, excluded the commercial bait south (cBs) data for 2020, or included or excluded the ichthyoplankton index called the MARECO index.

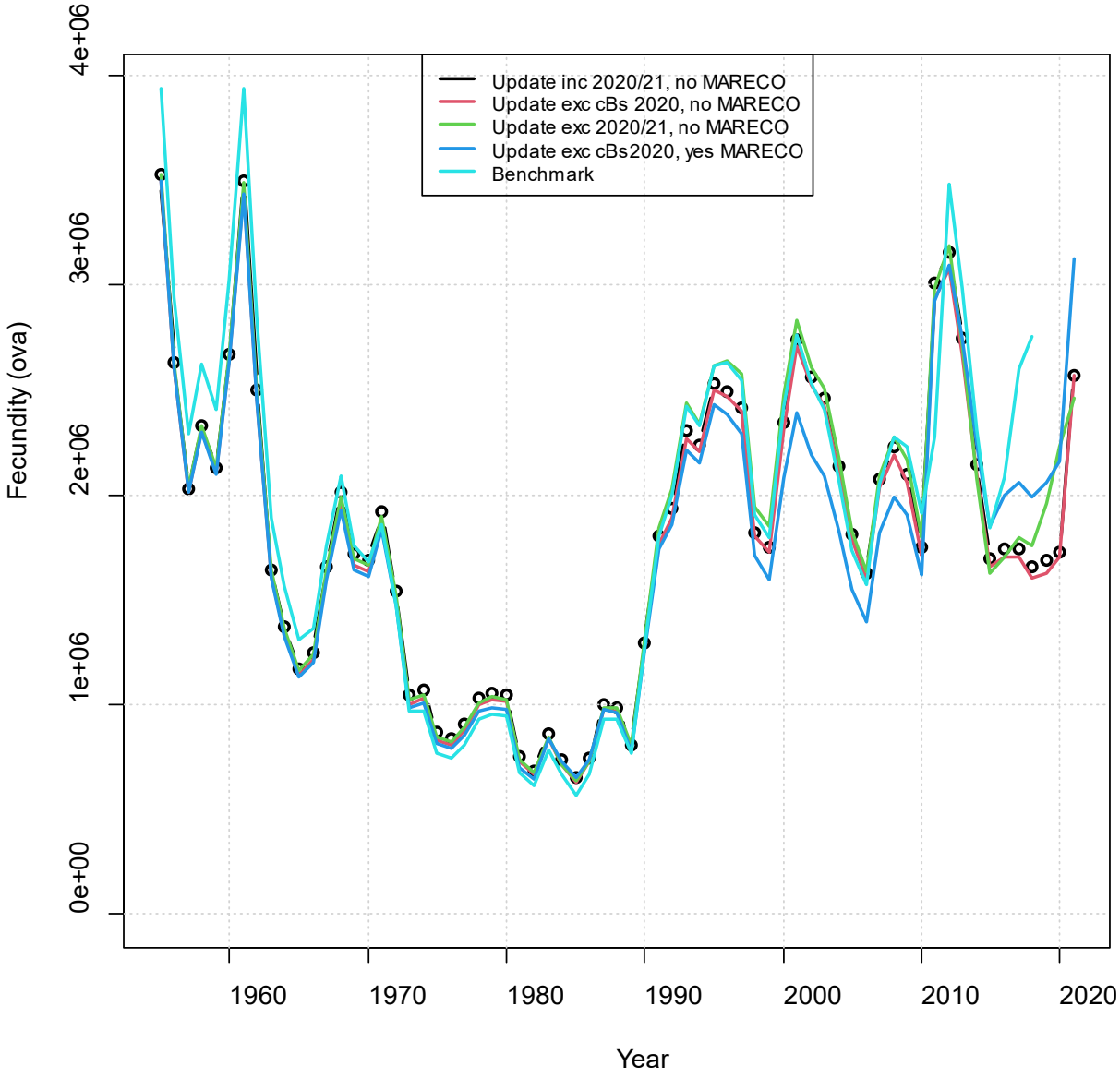


Figure A54. **Estimates of the fecundity for the base run (labeled Update exc cBs 2020, no MARECO) for a series of runs related to the inclusion of the 2020 and 2021 data. The runs either included or excluded the 2020 and 2021 data, excluded the commercial bait south (cBs) data for 2020, or included or excluded the ichthyoplankton index called the MARECO index.**

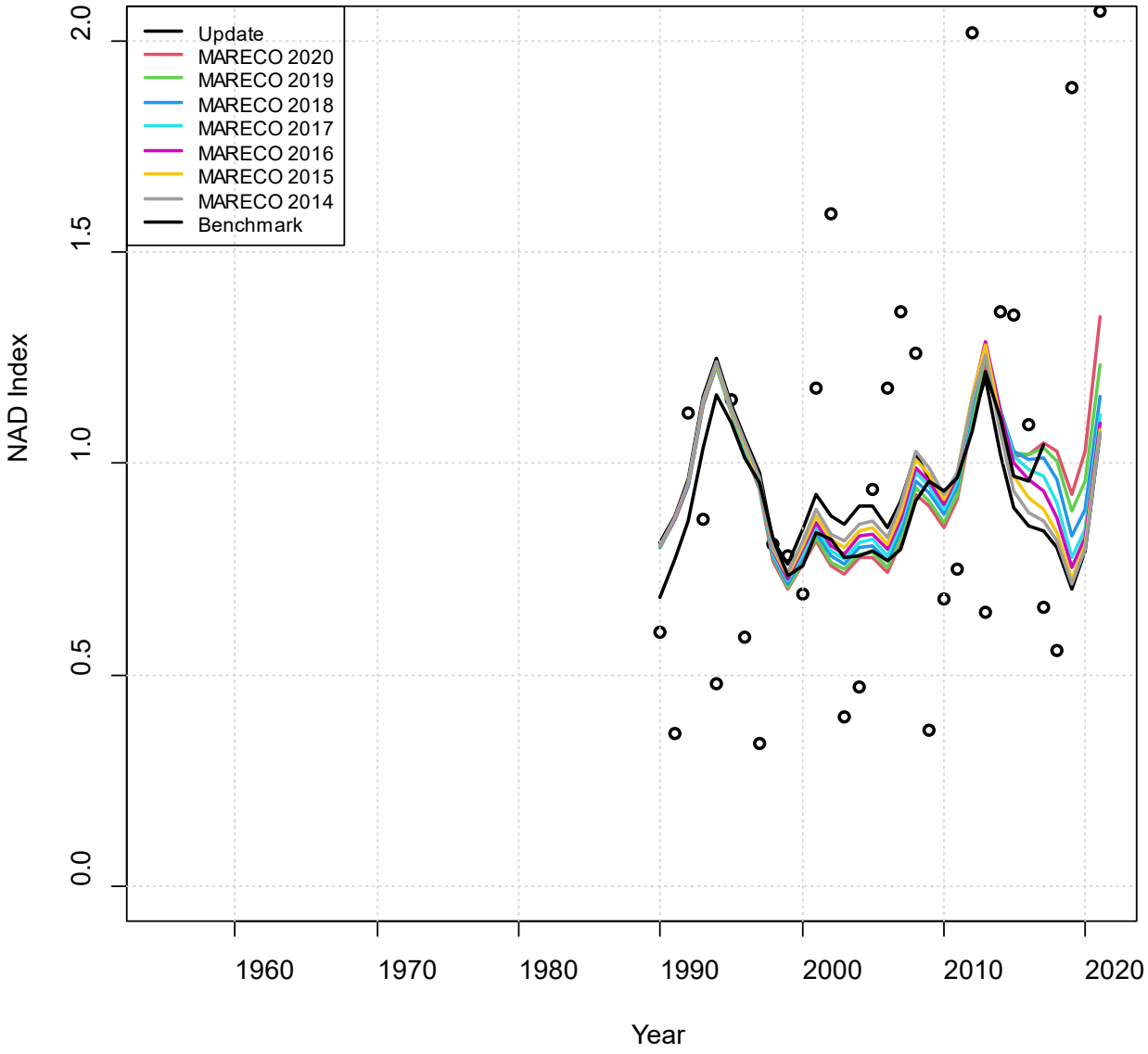


Figure A55. **Fit to the observed (open circles) NAD index for the base run, the last benchmark, and for a series of runs related to the inclusion of the MARECO ichthyoplankton index. The additional runs included the MARECO index with each run indicated by the terminal year of the index (2014-2020).**

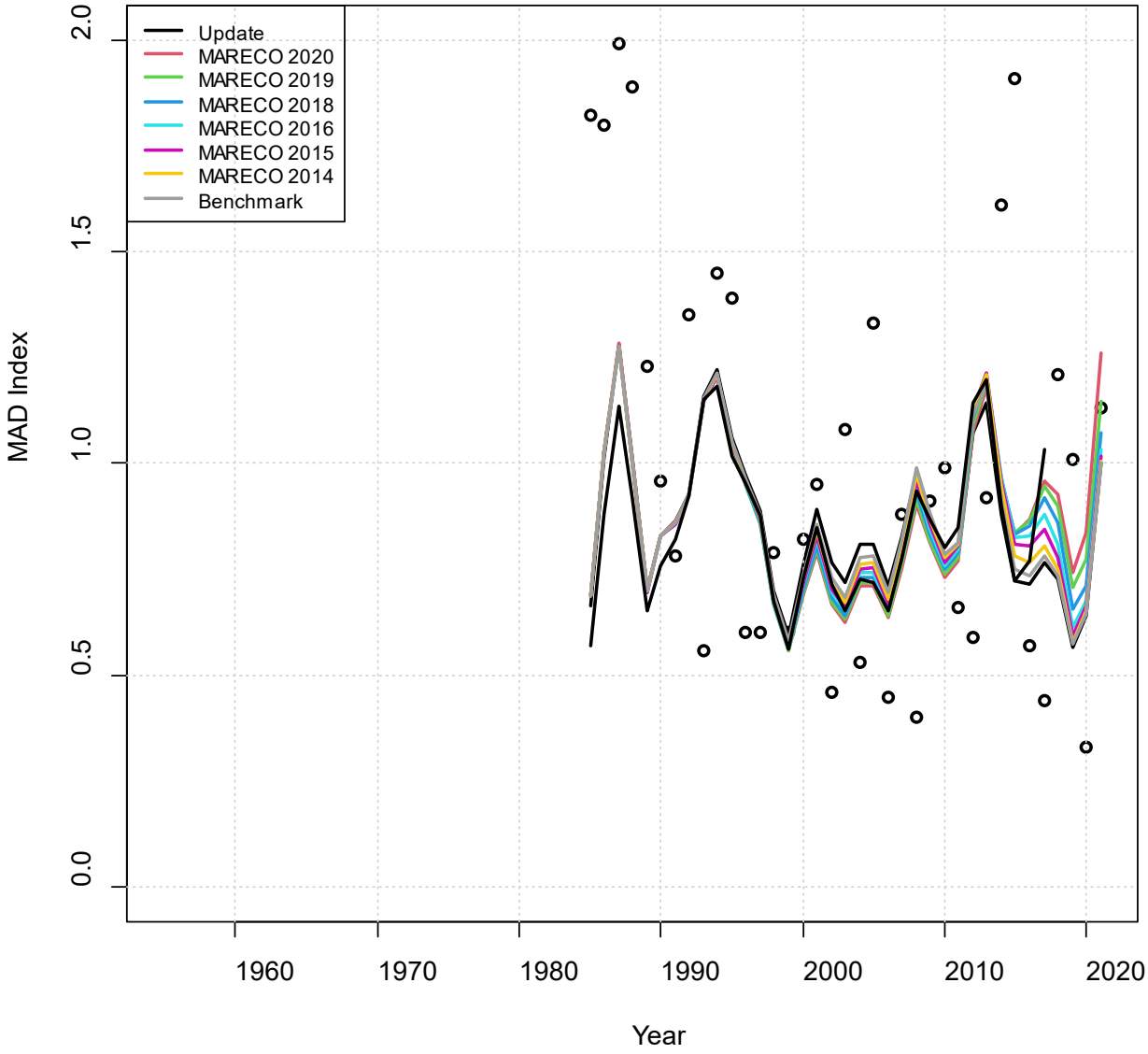


Figure A56. **Fit to the observed (open circles) MAD index for the base run, the last benchmark, and for a series of runs related to the inclusion of the MARECO ichthyoplankton index. The additional runs included the MARECO index with each run indicated by the terminal year of the index (2014-2020).**

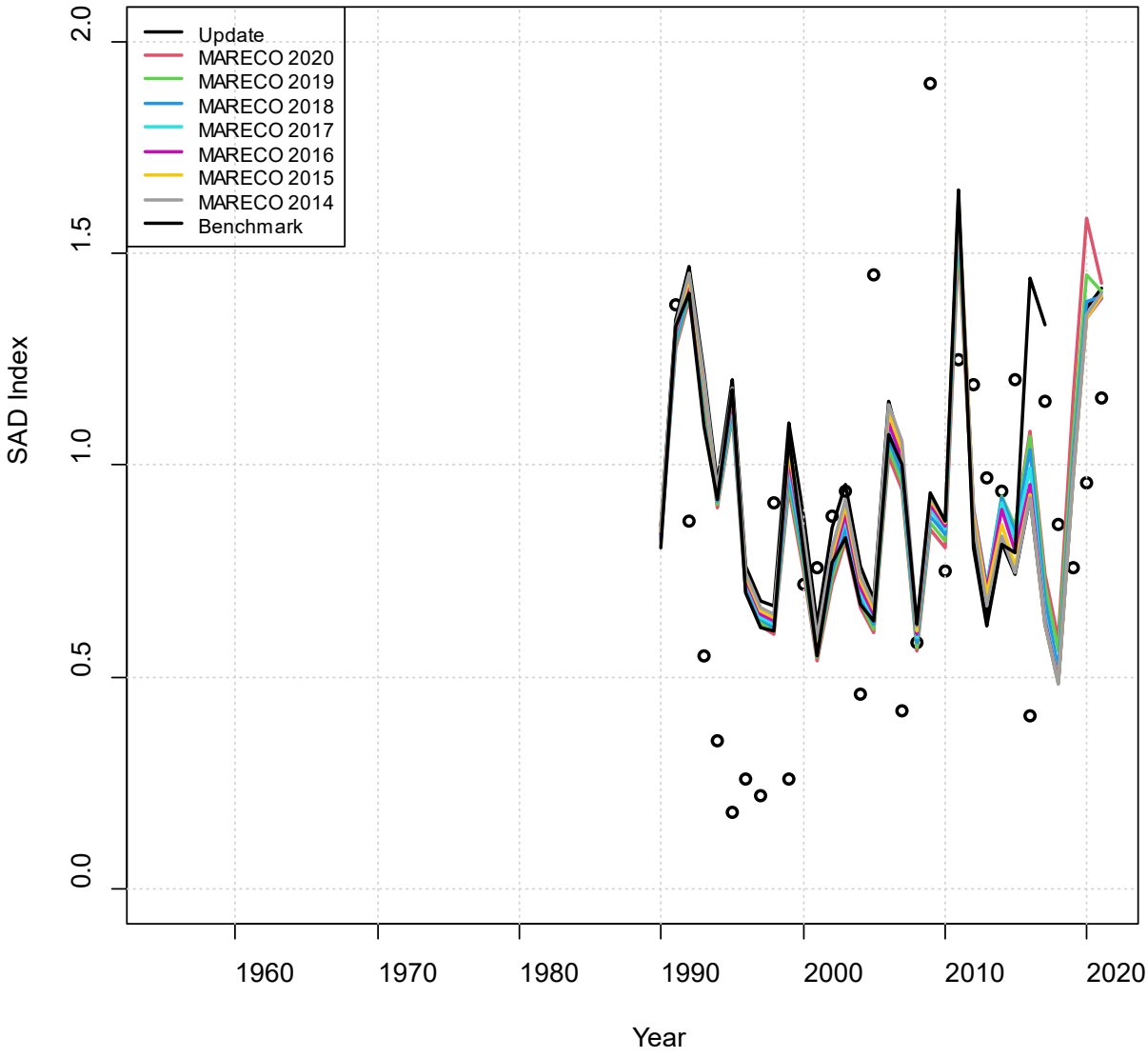


Figure A57. **Fit to the observed (open circles) SAD index for the base run, the last benchmark, and for a series of runs related to the inclusion of the MARECO ichthyoplankton index. The additional runs included the MARECO index with each run indicated by the terminal year of the index (2014-2020).**

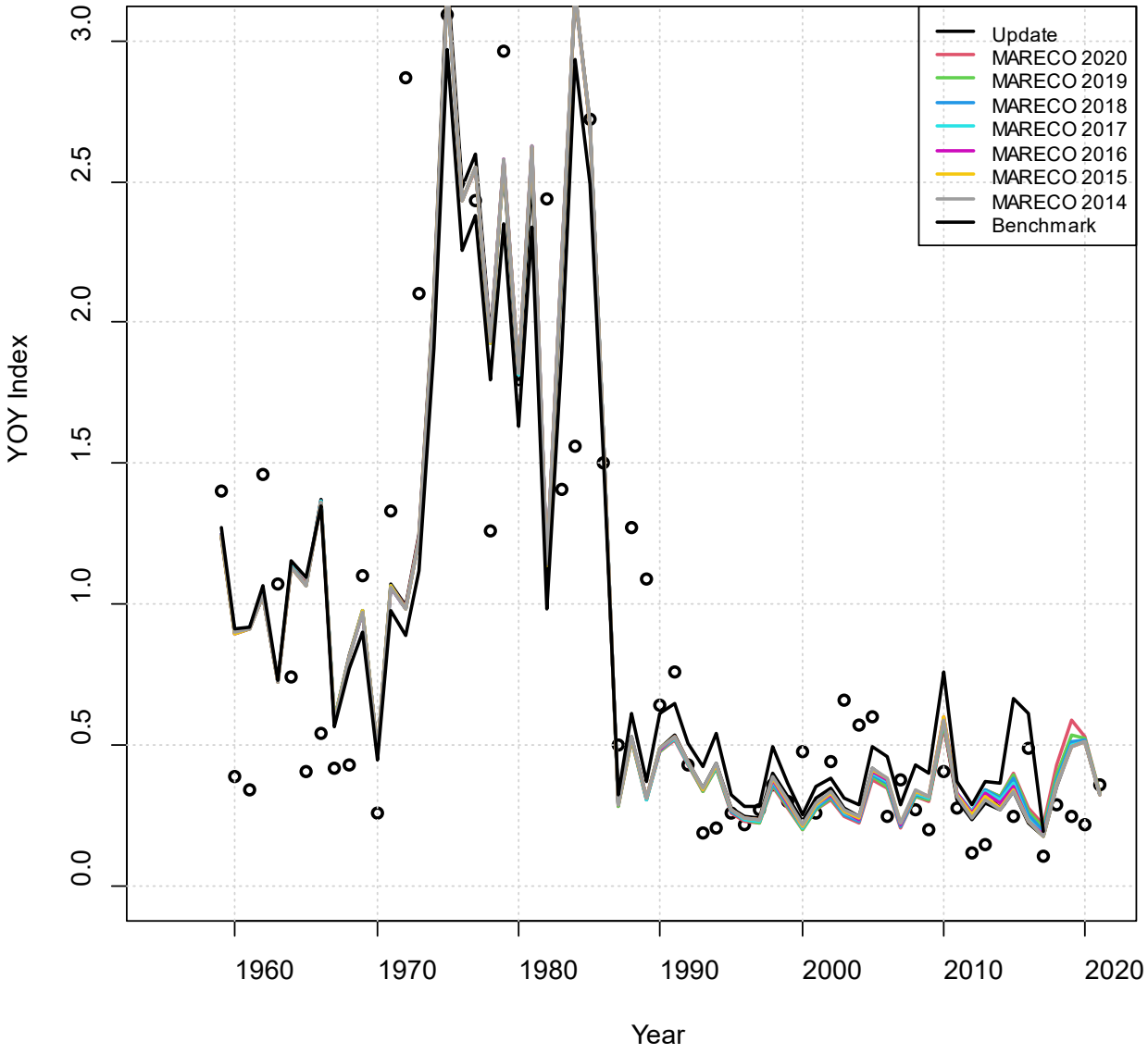


Figure A58. **Fit to the observed (open circles) recruitment index for the base run, the last benchmark, and for a series of runs related to the inclusion of the MARECO ichthyoplankton index. The additional runs included the MARECO index with each run indicated by the terminal year of the index (2014-2020).**

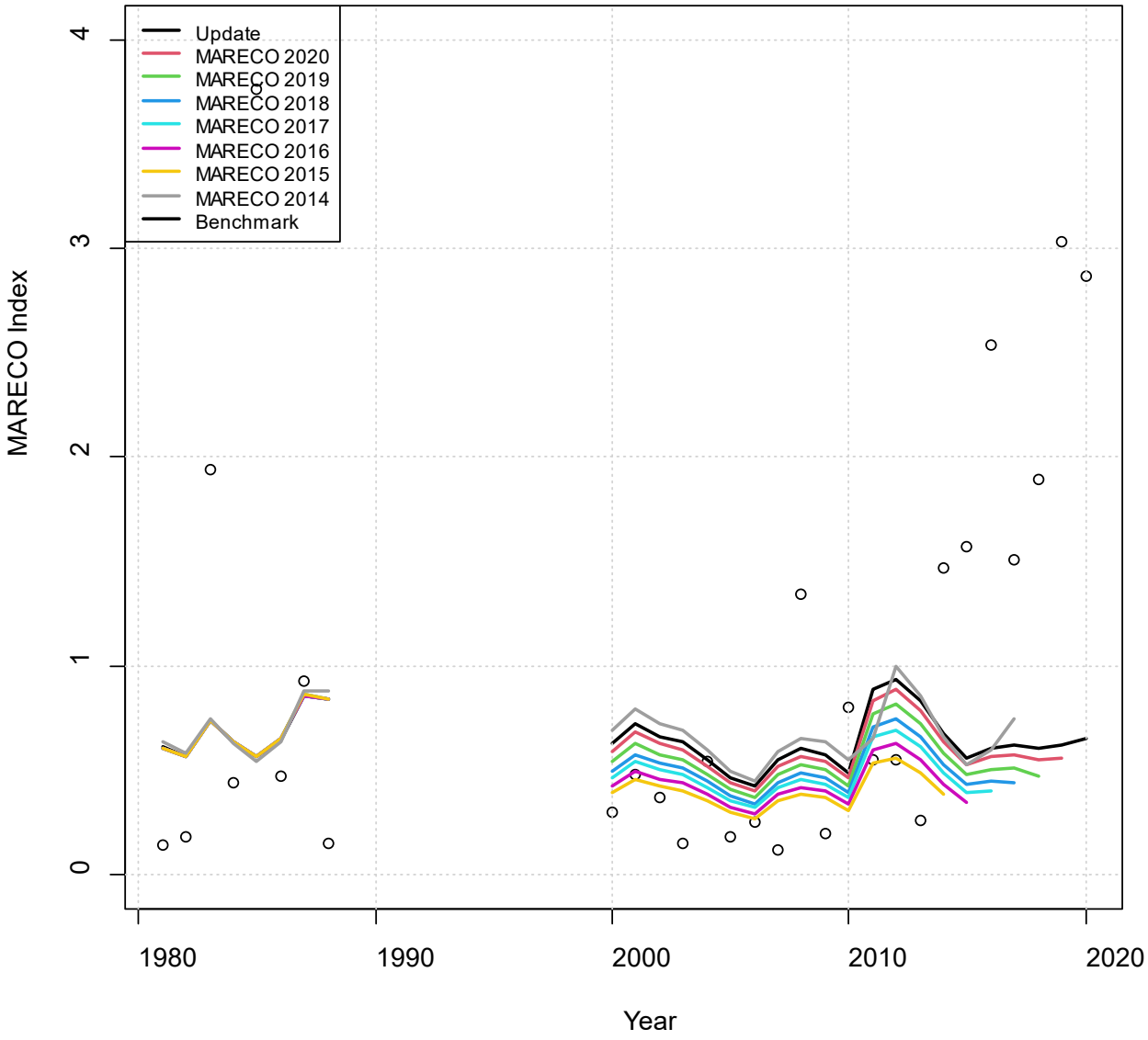


Figure A59. **Fit to the observed (open circles) MARECO index for the base run, the last benchmark, and for a series of runs related to the inclusion of the MARECO ichthyoplankton index. The additional runs included the MARECO index with each run indicated by the terminal year of the index (2014-2020). **Note that the update run is not plotted, as it doesn't include the MARECO index.**

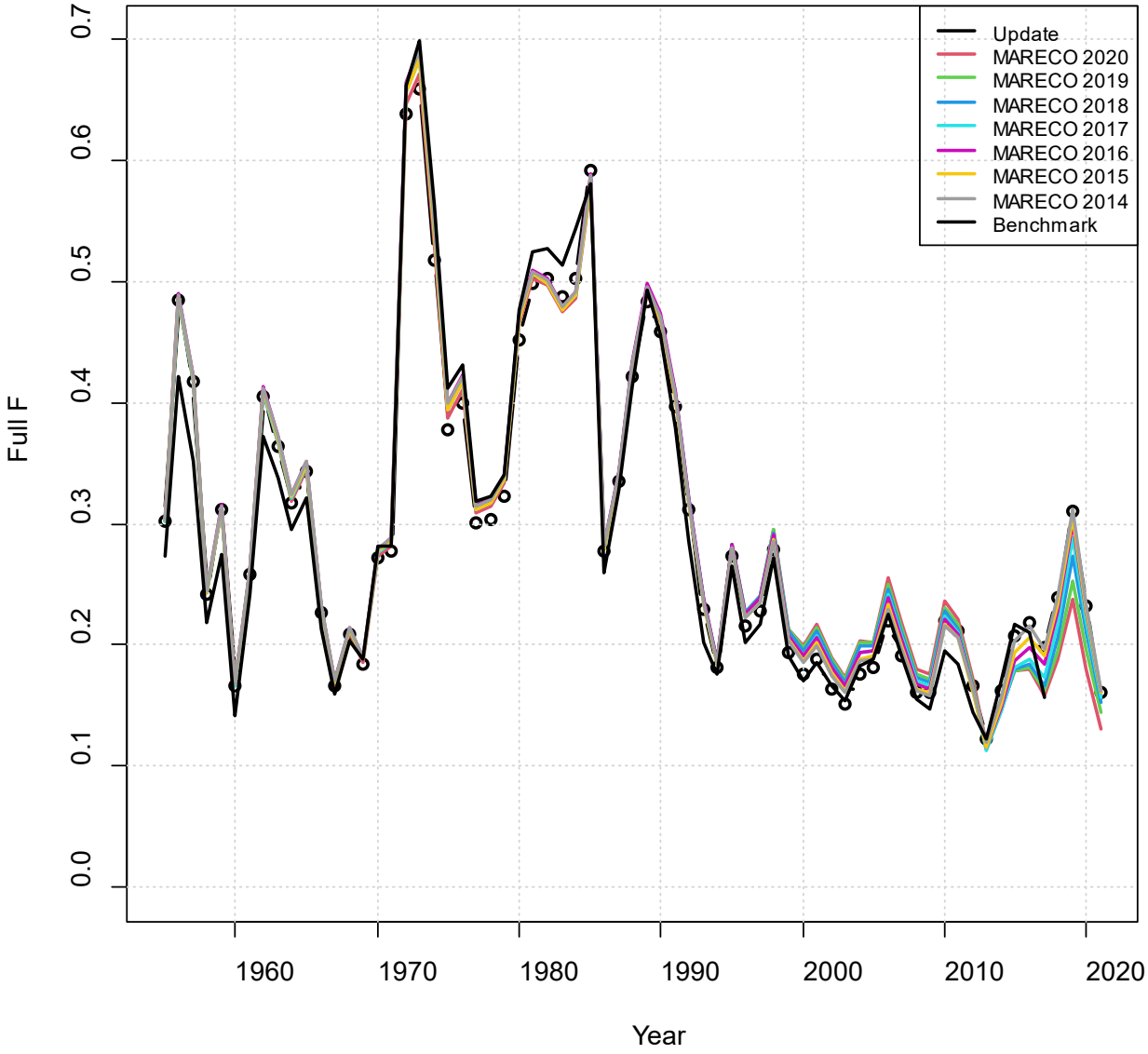


Figure A60. **Full fishing mortality rate from 1955-2021 for the base run, the last benchmark, and for a series of runs related to the inclusion of the MARECO ichthyoplankton index. The additional runs included the MARECO index with each run indicated by the terminal year of the index (2014-2020).**

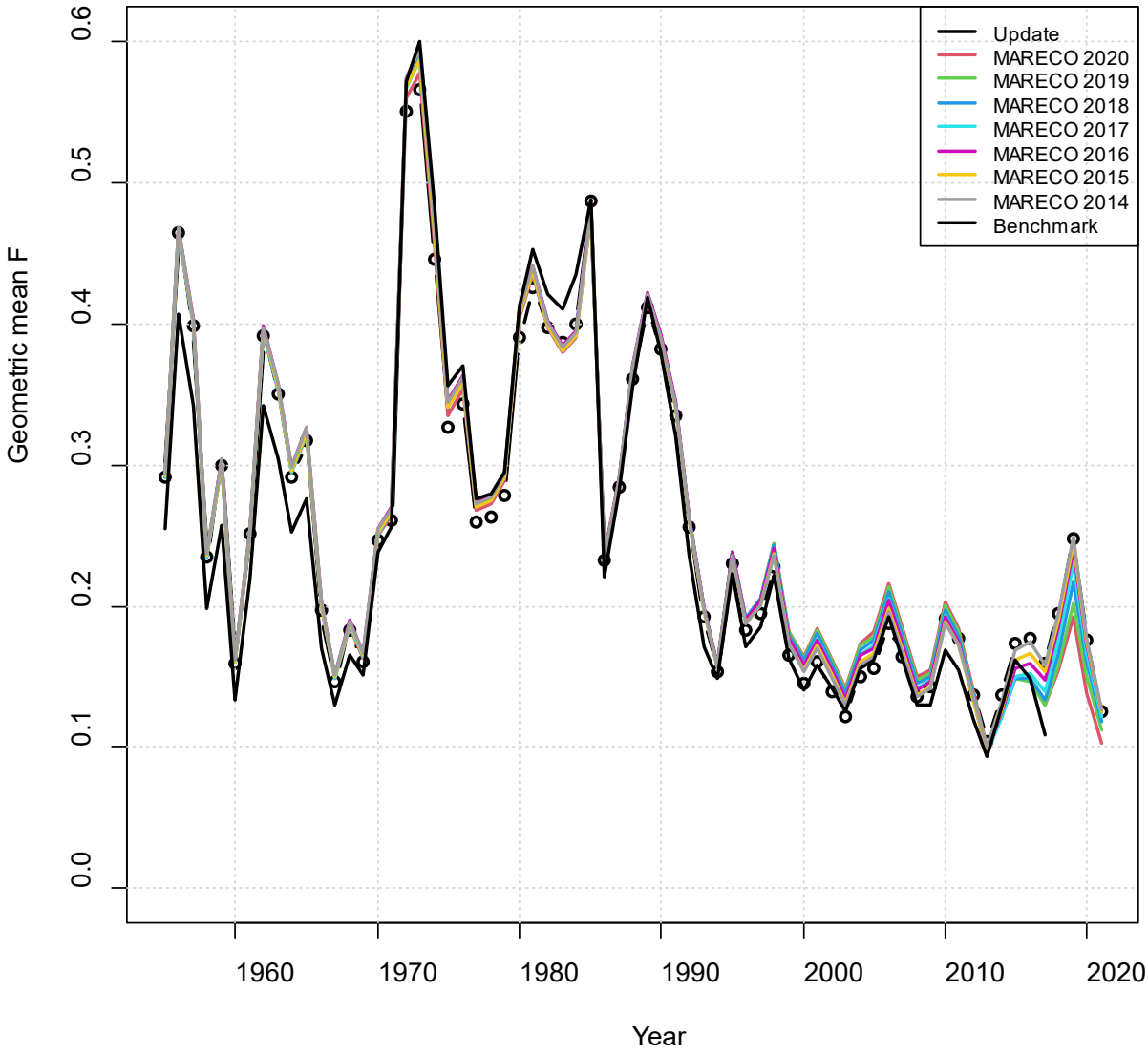


Figure A61. **The geometric mean fishing mortality rate for ages-2 to 4+ from 1955-2021 for the base run, the last benchmark, and for a series of runs related to the inclusion of the MARECO ichthyoplankton index. The additional runs included the MARECO index with each run indicated by the terminal year of the index (2014-2020).**

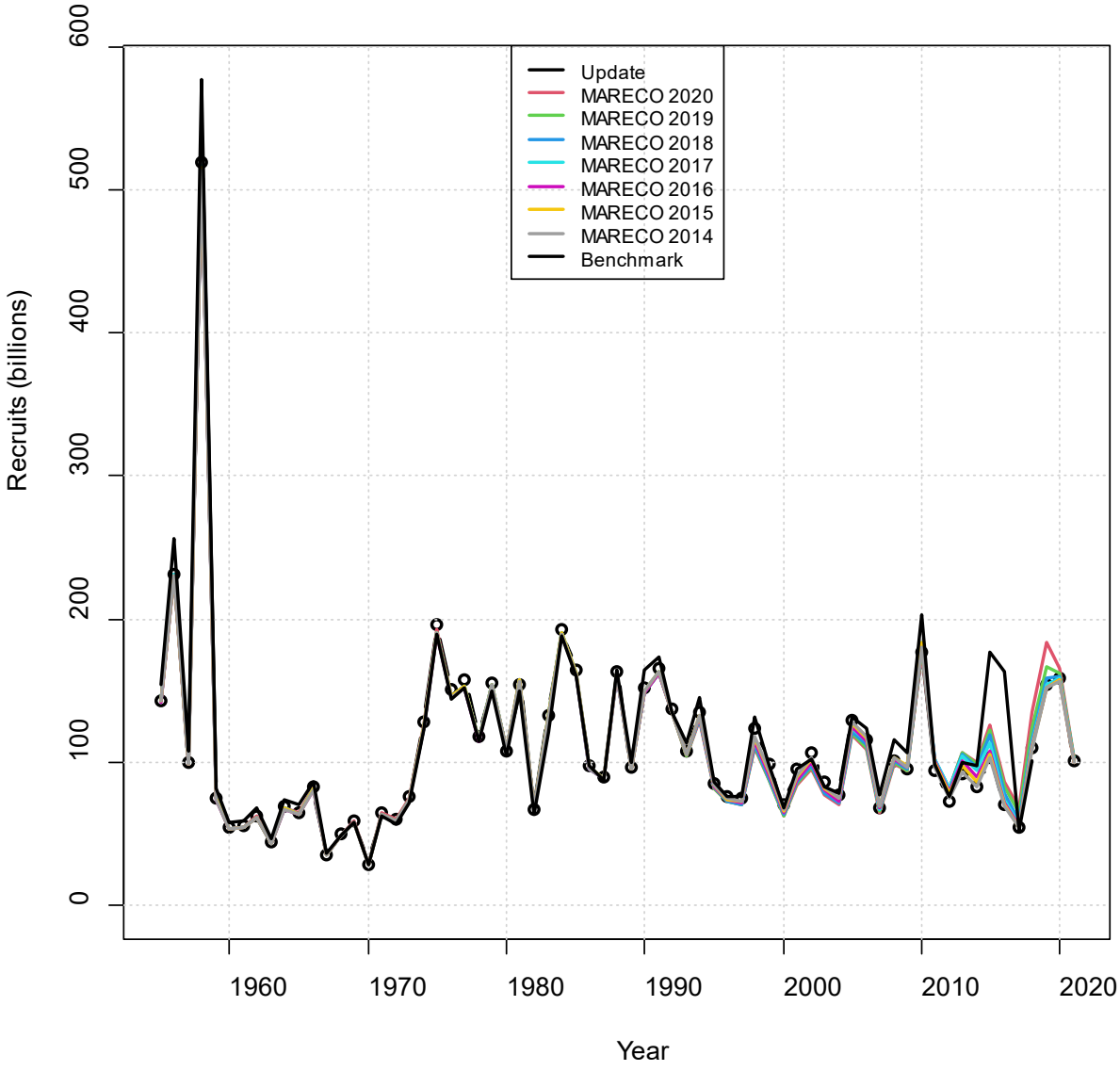


Figure A62. **The recruitment time series from 1955-2021 for the base run, the last benchmark, and for a series of runs related to the inclusion of the MARECO ichthyoplankton index. The additional runs included the MARECO index with each run indicated by the terminal year of the index (2014-2020).**

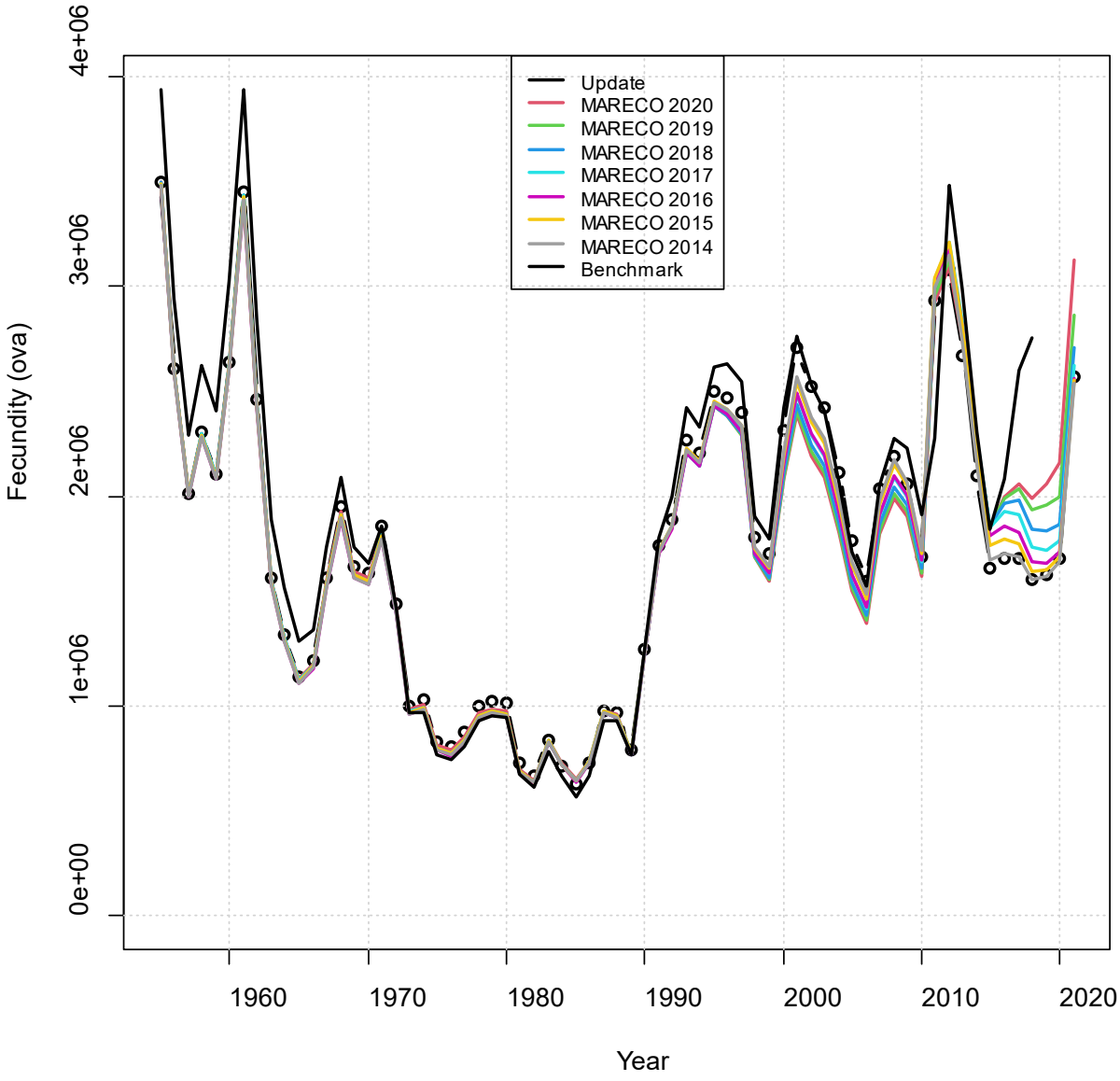


Figure A63. **The fecundity time series from 1955-2021 for the base run, the last benchmark, and for a series of runs related to the inclusion of the MARECO ichthyoplankton index. The additional runs included the MARECO index with each run indicated by the terminal year of the index (2014-2020).**

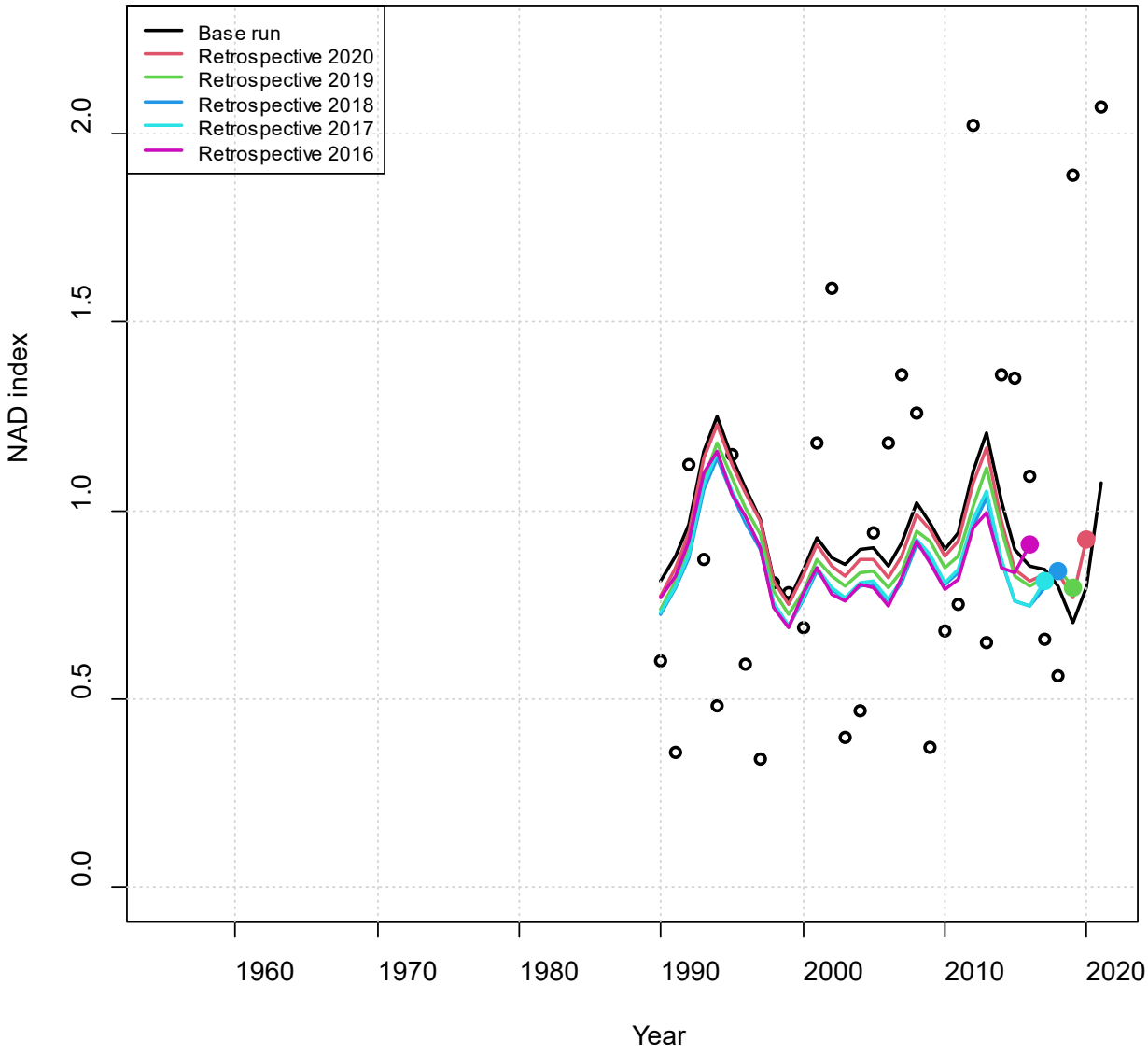


Figure A64. **Fit to the observed (open circles) NAD index for the retrospective analysis with terminal years from 2021 to 2016.**

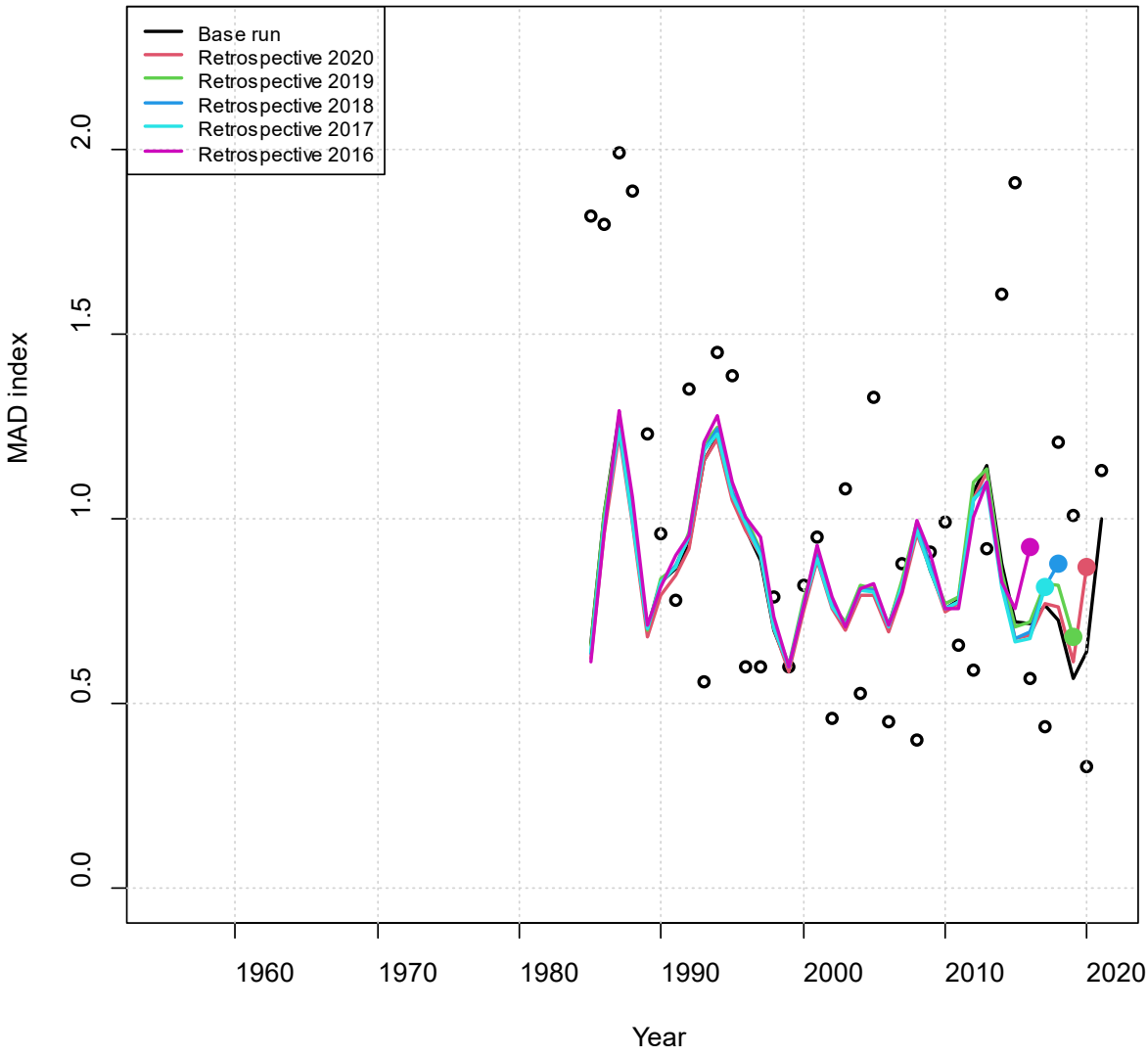


Figure A65. Fit to the observed (open circles) MAD index for the retrospective analysis with terminal years from 2021 to 2016.

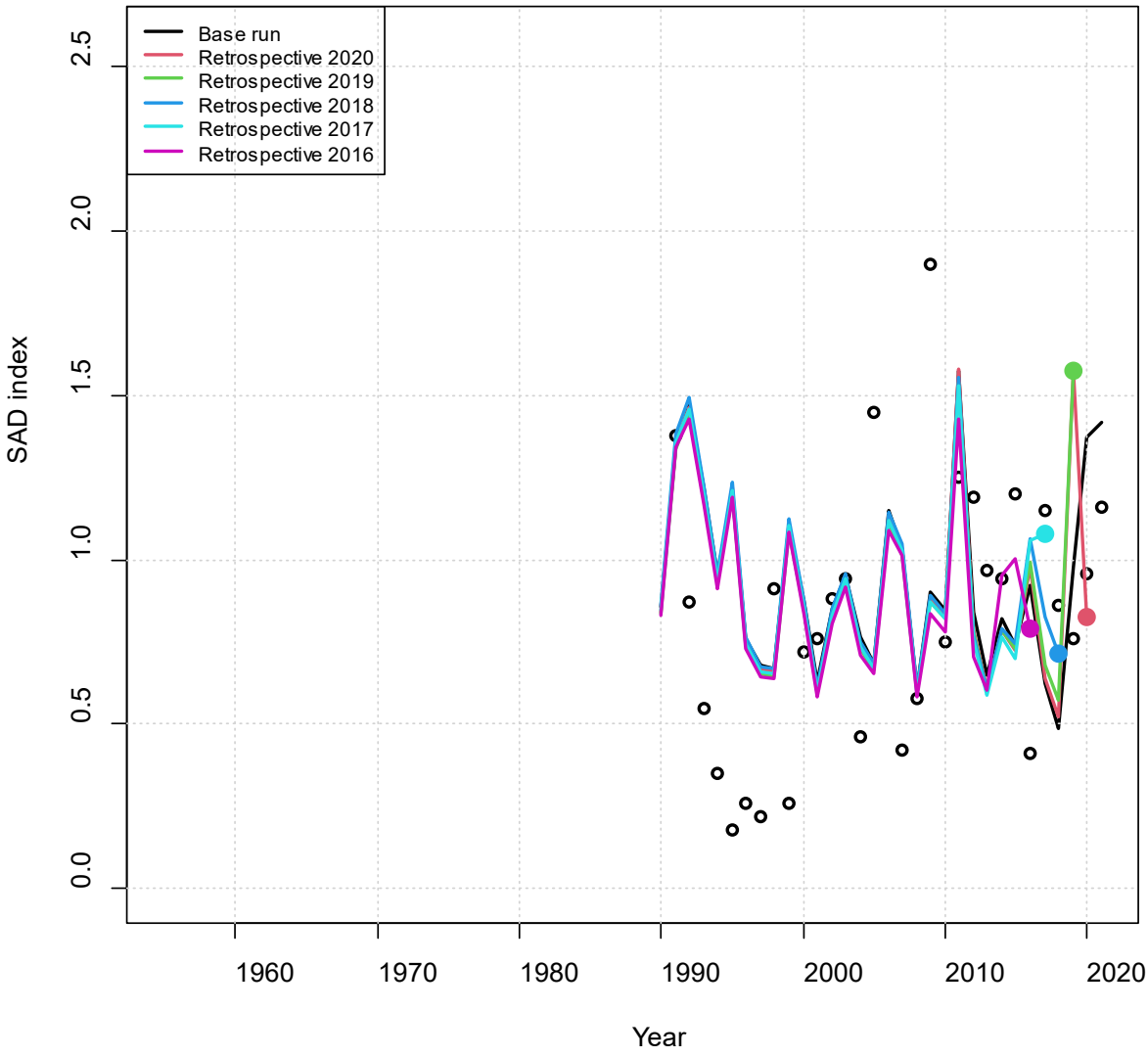


Figure A66. Fit to the observed (open circles) SAD index for the retrospective analysis with terminal years from 2021 to 2016.

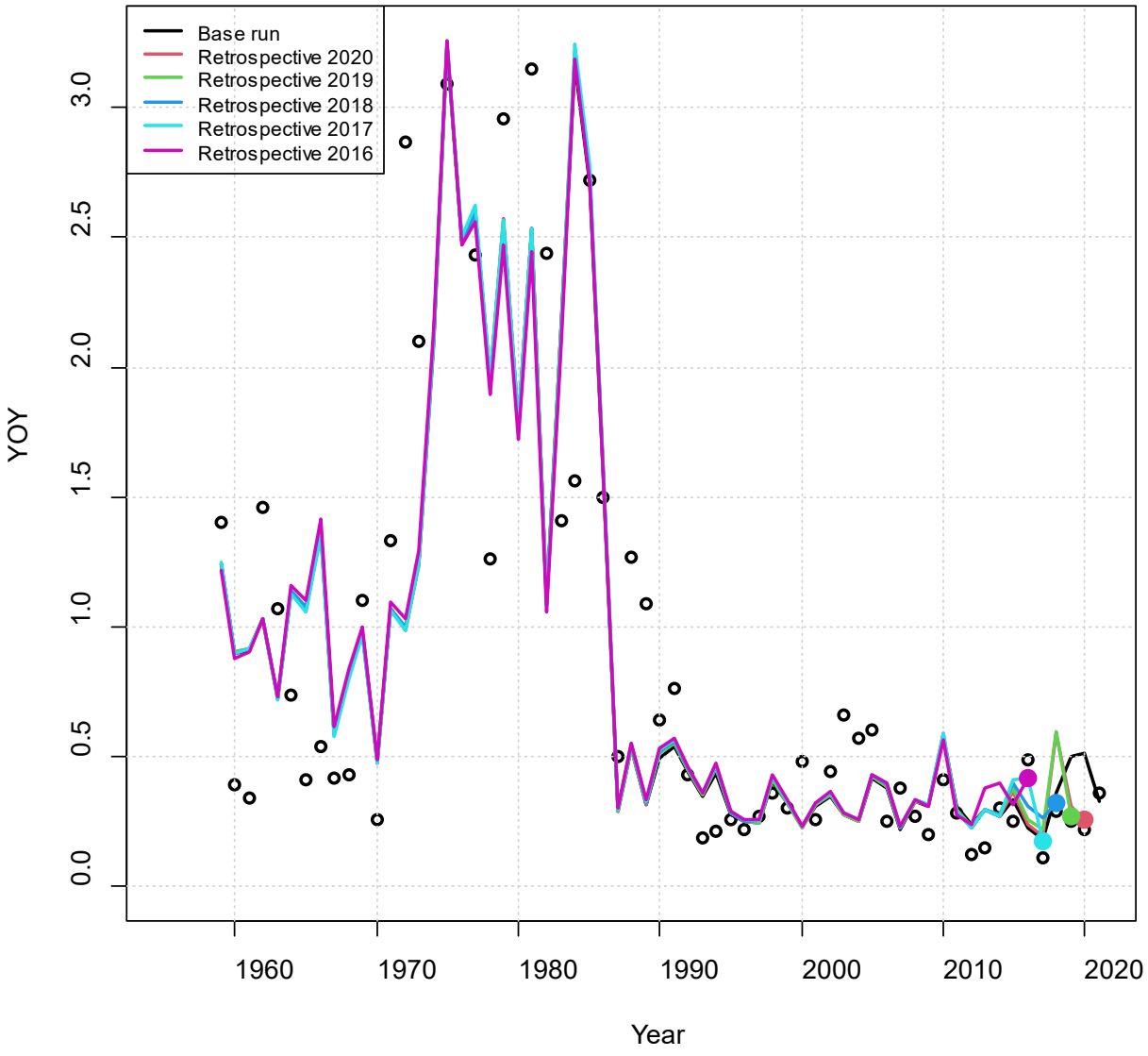


Figure A67. Fit to the observed (open circles) recruitment index for the retrospective analysis with terminal years from 2021 to 2016.

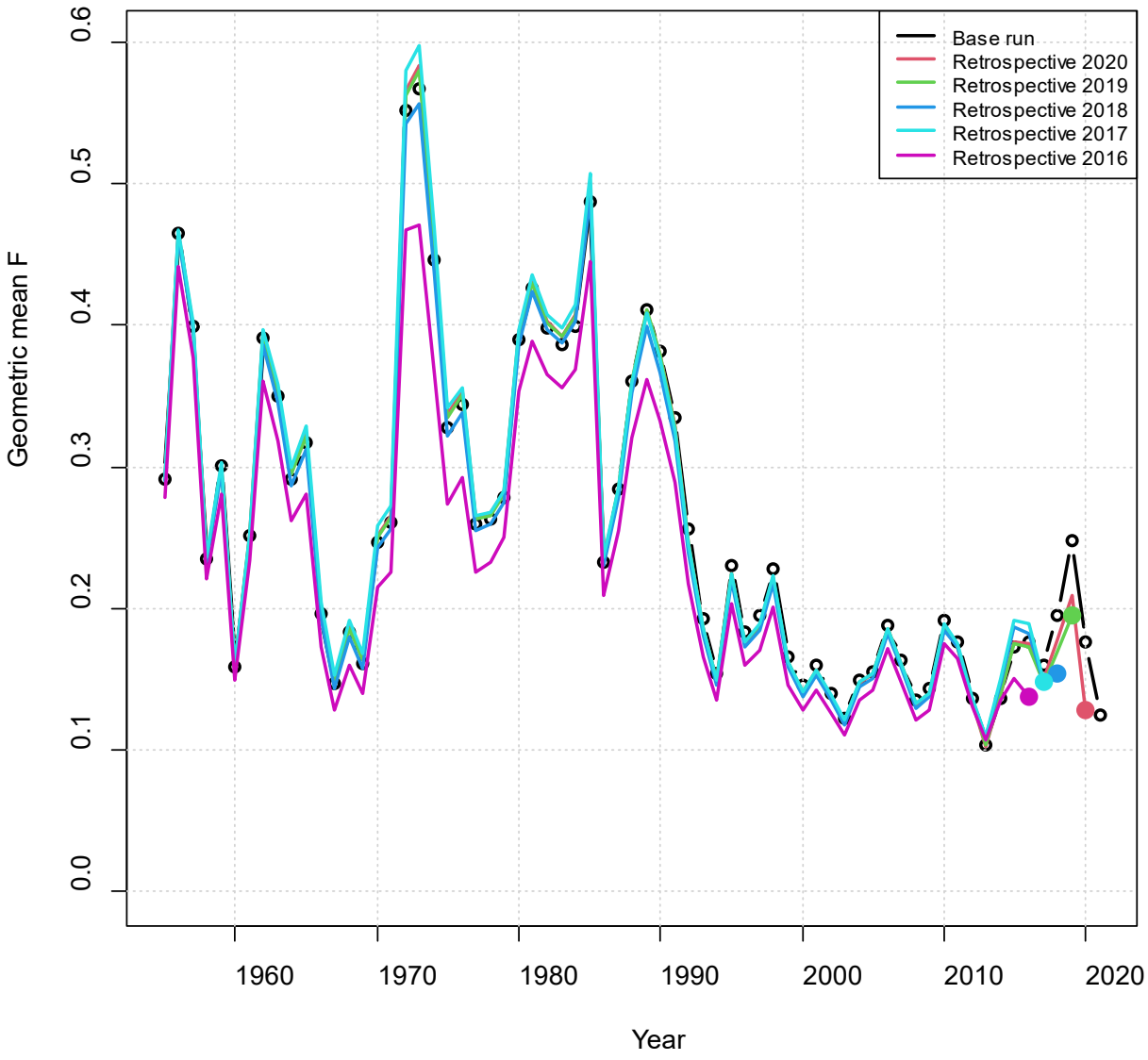


Figure A68. Estimates of the geometric mean fishing mortality rate for ages-2 to -4 for the retrospective analysis with terminal years from 2021 to 2016.

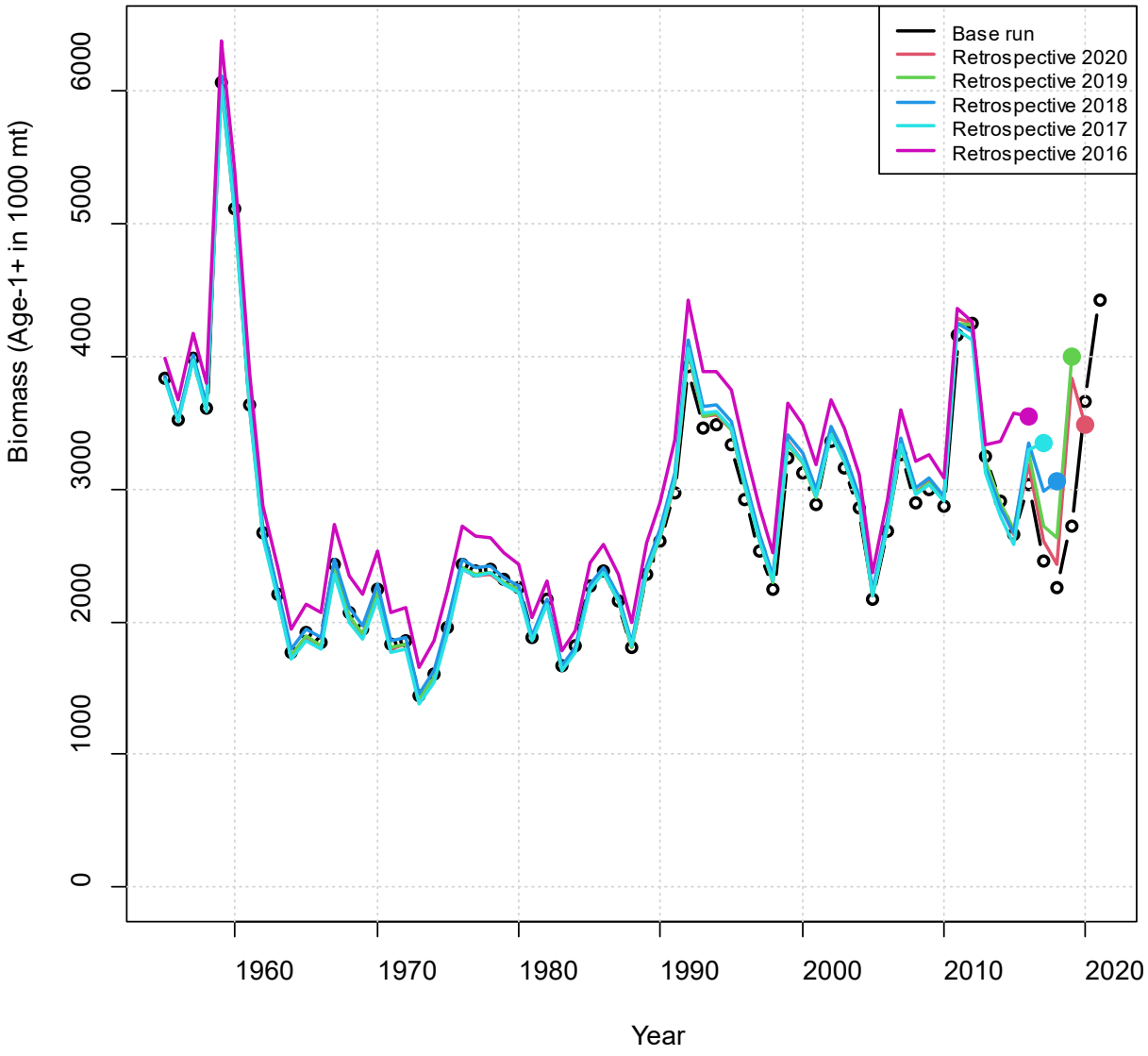


Figure A69. Estimates of the age-1+ biomass for the retrospective analysis with terminal years from 2021 to 2016.

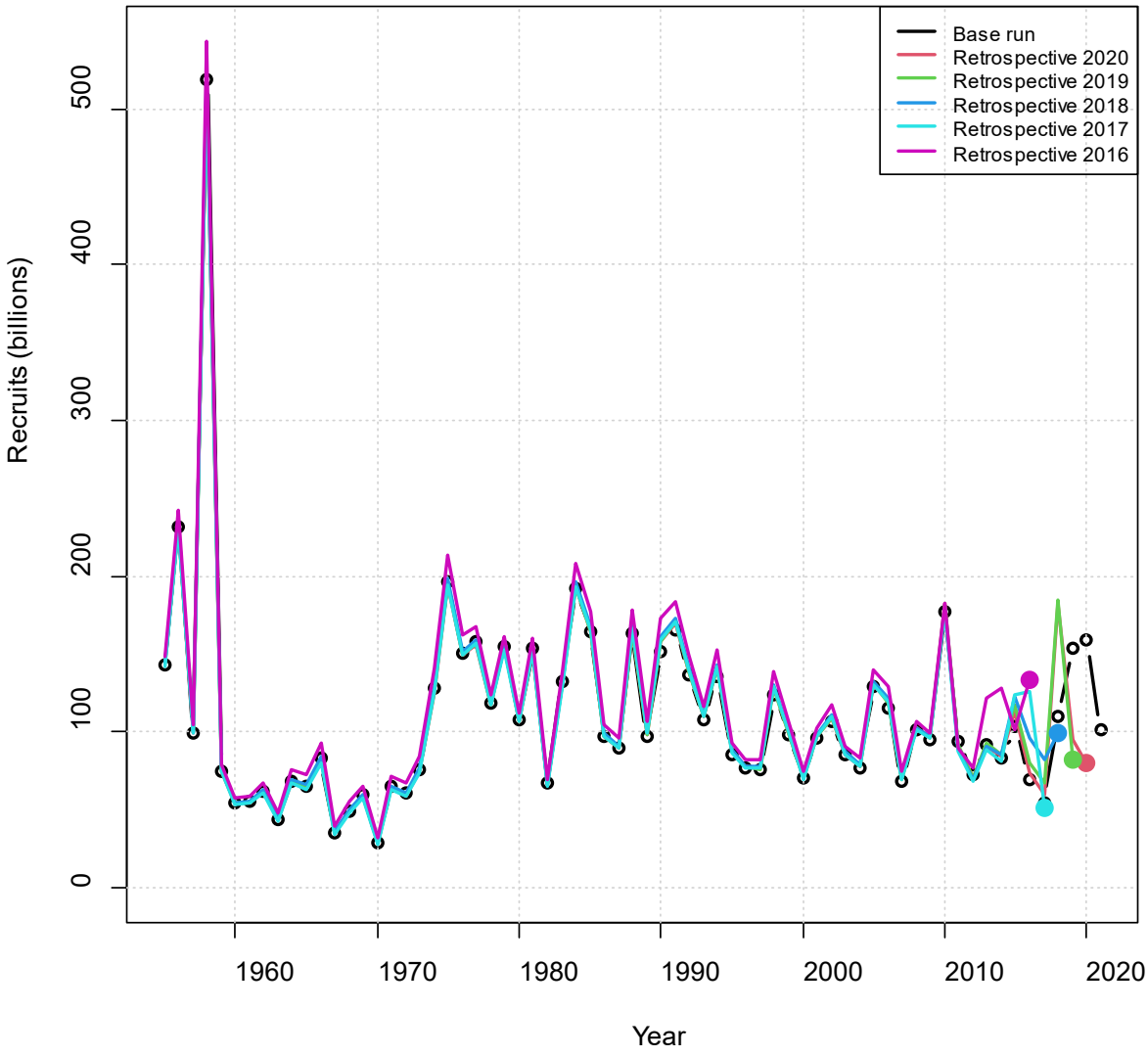


Figure A70. Estimates of the recruitment for the retrospective analysis with terminal years from 2021 to 2016.

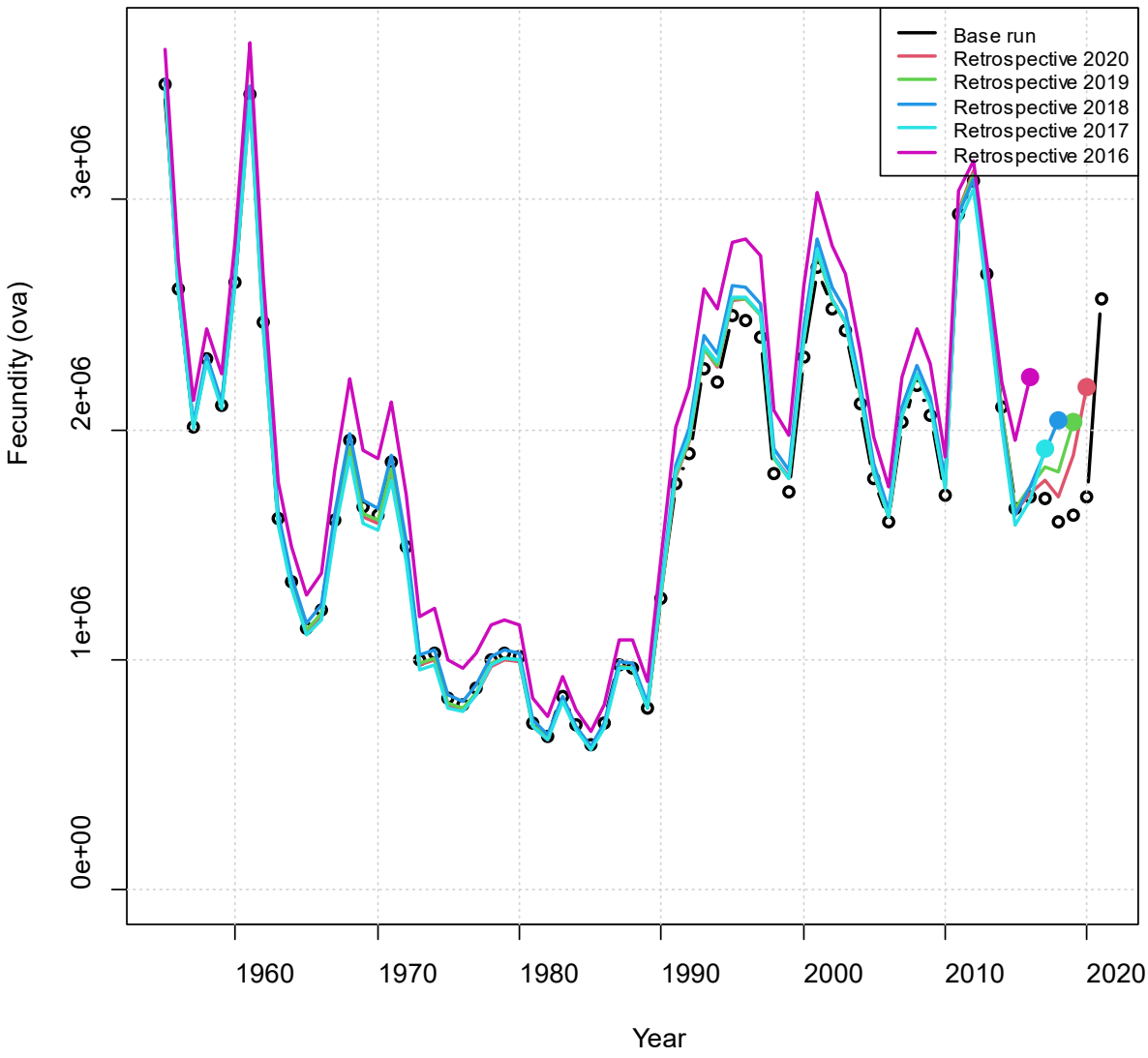


Figure A71. Estimates of the fecundity for the retrospective analysis with terminal years from 2021 to 2016.

Single-Species Research Recommendations

The following is the complete list of research recommendations from the single-species benchmark assessment (SEDAR 2020a).

Research recommendations are broken down into two categories: future research and data collection and assessment methodology. While all recommendations are high priority, the first recommendation is the highest priority. Each category is further broken down into recommendations that can be completed in the short term and recommendations that will require long term commitment. For the single-species assessment, the SAS recommends an update be considered in three years and a new benchmark be considered in six years.

Future Research and Data Collection

Short Term

1. Continue current level of sampling from bait fisheries, particularly in the Mid-Atlantic and New England. Analyze sampling adequacy of the reduction fishery and effectively sample areas outside of that fishery (e.g., work with industry and states to collect age structure data and biological data outside the range of the fishery).
2. Place observers on boats to collect at-sea samples from purse-seine sets, or collect samples at dockside during vessel pump-out operations (as opposed to current top of hold sampling) to address sampling adequacy.
3. Evaluate which proportion of bait landings by state are captured by gear versus which proportion are sampled for length and age composition to determine if current biosampling requirements are appropriate and adequate.
4. Continue to improve data validation processes for the bait fishery through ACCSP.
5. Conduct an ageing workshop to assess precision and error among readers with the intention of switching bait fishery age reading to state ageing labs.
6. Re-age historic old age samples (i.e., ages >7) to confirm the max age of Atlantic menhaden.
7. Investigate the relationship between fish size and school size to address selectivity (specifically addressing fisher behavior related to harvest of specific school sizes).
8. Investigate the relationship between fish size and distance from shore (addressing selectivity).

Long Term

1. Develop and implement a menhaden-specific, multi-year coastwide fishery-independent index of adult abundance-at-age with ground-truthing for biological information (e.g., size and age composition). A sound statistical design is essential. Ideally, it should be done coast-wide, but area-specific surveys that cover the majority of the population and are more cost-effective could provide substantial improvements over the indices currently used in the assessment.

2. Continue age-specific studies on spatial and temporal dynamics of spawning (where, how often, how much of the year, batch spawning, etc.)
3. Conduct an ageing validation study, making sure to sample older age classes.
4. Continue to investigate environmental covariates related to productivity and recruitment on a temporal and spatial scale.
5. Consider other ageing methods for the future, such as the use of Fourier transform near infrared spectroscopy (FT-NIRS).

Assessment Methods

Short Term

1. Investigate index standardization to improve CVs and explore methods of combining indices at a regional or coastwide level.
2. Explore the covariance between life history parameters to improve the understanding of uncertainty in the model.
3. Explore the error structure between MCMC and MCB.
4. Perform simulation testing on the Deyle et al. method used in the projections and determine if recruitment is accurately tracked by the method and improve short term projections.
5. Conduct a Management Strategy Evaluation (MSE).

Long Term

1. Continue to monitor model diagnostics given that the model is not robust to anomalous year-classes in the terminal year.
2. Develop a seasonal spatially-explicit model once sufficient age-specific data on movement rates of menhaden are available.

Ecological Reference Point Research Recommendations

The following is the complete list of research recommendations from the ecological reference point stock assessment (SEDAR 2020b).

The Ecological Reference Point Work Group (ERP WG) endorsed the research recommendations laid out in the single-species assessment to improve the understanding of Atlantic menhaden population dynamics, especially the recommendations to develop an Atlantic menhaden-specific coastwide fishery-independent index of adult abundance and to continue to investigate environmental covariates related to productivity and recruitment on a temporal and spatial scale.

In addition, the ERP WG identified a number of research needs to improve the multispecies modeling efforts and the development of ecological reference points for Atlantic menhaden, as well as process considerations to fully implement ecosystem-based fishery management.

Future Research and Data Collection

Short term

1. Expand collection of diet and nutrition data along the Atlantic coast to provide seasonally and regionally stratified annual, year-round monitoring of key predator diets to provide information on prey abundance and predator consumption. This could be done through existing data collection programs.

Long term

1. Improve monitoring of population trends and diet data in non-finfish predators (e.g., birds, marine mammals) and data-poor prey species (e.g., bay anchovies, sand eels, benthic invertebrates, zooplankton, and phytoplankton) to better characterize the importance of Atlantic menhaden and other forage species to the ecosystem dynamics.

Modeling Needs

Short term

1. Conduct a management-strategy evaluation (MSE) to identify harvest strategies that will maximize the likelihood of achieving the identified ecosystem management objectives.
2. Continue development of the NWACS-MICE model to incorporate recruitment deviations (from external models or primary productivity time series) to better capture the productivity dynamics of Atlantic menhaden and other species.
3. Continue development of the VADER model to include bottom-up effects of Atlantic menhaden abundance on key predator species.
4. Continue development of the NWACS-FULL model to bring other species up to date and continue exploring the impacts of fishing on higher trophic level predators like birds and mammals.

Management Process Needs

Short term

1. Develop a coordinated timeline of assessments and assessment updates for Commission-managed species in order to provide the most up-to-date multispecies inputs for the NWACS-MICE model during ERP assessment updates.

Long term

1. Develop a plan to coordinate management of Atlantic menhaden and their predator species across management Boards. This will require changes to the way the Commission has historically operated. These species are currently managed by separate Boards within the Commission, and management objectives, including *F* and *B* targets for each species, are set independently of each other. For successful ecosystem-based fishery management, consistent management objectives for individual species and the ecosystem should be set holistically with the engagement of all managers and stakeholders.

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

July 18, 2022

To: **Atlantic Menhaden Management Board**

From: **Tina Berger, Director of Communications**

RE: **Advisory Panel Nomination**

Please find a new nomination to the Atlantic Menhaden Advisory Panel – Barbara Garrity-Blake from Gloucester, NC. Barbara is a member of NC Catch (local seafood consumer awareness group), teaches a graduate level marine policy class at Duke University Marine Lab, did her PhD research on the anthropology of the menhaden fishery, and previously served on the NC Marine Fisheries Commission. Please review this nomination for action at the next Board meeting.

If you have any questions, please feel free to contact me at (703) 842-0749 or tberger@asmfc.org.

Enc.

cc: James Boyle

Atlantic Menhaden Advisory Panel

Bolded names await Board approval

Maine

Michael Dawson (comm. inshore purse seine)
39 Lakeview Drive
Bristol, ME 04539
Phone: 207.380.4036
kamano@tidewater.net
Appt Confirmed 1/27/22

Vincent Balzano (comm. trawl & purse seine)
31 Vines Road
Saco, ME 04072
Phone (day): 207.282.3627
Phone (eve): 207.332.6492
vbalzano@mainerr.com
Appt Confirmed 2/1/17

New Hampshire

1 Vacancy – recreational

Massachusetts

Patrick Paquette (rec/for-hire/comm)
61 Maple Street
Hyannis, MA 02601
Phone: 781.771.8374
basicpatrick@aol.com
Appt Confirmed 10/26/16

Bob Hannah (comm. seine/traps)
335 Concord Street
Gloucester, MA 01930
Phone: 978.879.6727
Zoey01930@yahoo.com
Appt Confirmed 10/26/16

Rhode Island

Meghan Lapp (comm.)
100 Davisville Pier
North Kingstown, RI 02852
Phone: 401.218.8658
FAX: 401.295.5825
Meghan@seafreezeltd.com
Appt Confirmed 10/26/16

David P. Monti (rec/for-hire)
399 Greenwood Avenue
Warwick, RI 02886
Phone (day): 401.480.3444
Phone (eve): 401.737.4515
dmontifish@verizon.net
Appt Confirmed 10/26/16

Connecticut

Vacancy (rec)

New York

William Caldwell (comm. seine)
75 East Tiana Road
Hampton Bays, NY 11946
Phone: 631.767.8257
Caldwell691@gmail.com
Appt Confirmed 1/27/22

Melissa Dearborn (processor)
Regal Marine Products, Inc.
198 West 9th Street
Huntington Station, NY 11746
Phone (day): 631.385.8284
Phone (eve): 631.385.7753
FAX: 631.271.5294
regalmar@optonline.net
Appt. Confirmed 7/17/01
Appt. Reconfirmed 1/23/06
Appt Reconfirmed 5/10

New Jersey

Jeff Kaelin (comm. trawl and purse seine)
Lund's Fisheries, Inc.
PO Box 830
997 Ocean Drive
Cape May, NJ 08204-0830
Phone: 207.266.0440
jkaelin@lundsfish.com
Appt. Confirmed 9/19/09

Paul Eidman (rec)
9 Williamsburg Drive
Tinton Falls, NJ 07753
Phone: 732.614.3373
paulyfish@reeltherapy.com
Appt Confirmed 10/26/16

Delaware

William R. Wilson (rec)
18483 Cedar Drive
Lewes, DE 19958
Phone (day): 302.644.3454

Atlantic Menhaden Advisory Panel

Bolded names await Board approval

Phone (eve): 302.344.5853
FAX:(302.644.3454
birdcarver@aol.com
Appt Confirmed 12/17/03
Appt. Confirmed 12/07

Leonard Voss Jr. (comm. gillnet/pot/dredge)
2854 Big Oak Road
Smyra, DE 19477
Phone: 302.423.6564
shrlvss@aol.com
Appt Confirmed 10/26/16

Maryland
David Sikorski (rec)
4637 Willowgrove Drive
Ellicot City, MD 21042
Phone: 443.621.9186
davidsikorski@mac.com
Appt Confirmed 2/3/15

John W. Dean (comm/pound net)
49925 Hays Beach Road
Scotland, MD 20687
Phone: 301.904.8078
Selbysuzi1121@aol.com
Appt Confirmed 2/3/15

Virginia
Jimmy Kellum (commercial purse seine)
144 Kellum Drive
Weems, VA 22576
Phone (day): 804.761.0673
Phone (eve): 804.438.5618
FAX: 804.438.5306
Kellum.maritime@gmail.com
Appt Confirmed 11/3/09

Peter Himchak (commercial purse seine)
Omega Protein
PO BOX 85
Tuckerton, NJ 08087
peter.himchak@omegaprotein.com
Appt Confirmed 10/26/16

Jeff Deem (rec)
6701 Newington Road
Lorton, VA 22079
Phone: 703.550.9245
deemjeff@erols.com
Appt Confirmed 10/26/16

North Carolina
Scott Williams (rec)
7104 Stonehaven Drive
Waxhaw, NC 28173
Phone: 704.989.7211
Scott.williams.charlotte@gmail.com
Appt Confirmed 10/26/16

Barbara Garrity-Blake (non-traditional)
134 Shore Drive
P.O. Box 91
Gloucester, NC 28528
Phone: 252.342.8028
garrityblake@gmail.com

South Carolina
Vacancy (rec)

Georgia
Ken Hinman (conservation)
Wild Oceans
PO Box 258
Waterford, VA 20197
Phone: 703.777.0037
Fax: 703.777.1107
khinman@wildoceans.org
Appt. Confirmed 2/19/02
Appt. Confirmed 2/06
Appt Reconfirmed 5/10

Florida
Charles W. Hamaker (rec)
5648 Floral Avenue
Jacksonville, FL 32211
Phone (day): 904.630.3025
Phone (eve): 904.725.3775
FAX: 904.630.3007
charlesh@cou.net
Appt. Confirmed 7/17/01
Appt. Reconfirmed 1/2/06
Appt Reconfirmed 4/22/10

Atlantic Menhaden Advisory Panel

Bolded names await Board approval

PRFC

Richard H. Daiger (comm/rec gillnet)
173 Oyster House Road
Montross, VA 22520
Phone: 804.472.2184
Appt. Confirmed 7/17/01
Appt. Reconfirmed 1/2/06
Appt Reconfirmed 5/10

ATLANTIC STATES MARINE FISHERIES COMMISSION

Advisory Panel Nomination Form

This form is designed to help nominate Advisors to the Commission's Species Advisory Panels. The information on the returned form will be provided to the Commission's relevant species management board or section. Please answer the questions in the categories (All Nominees, Commercial Fisherman, Charter/Headboat Captain, Recreational Fisherman, Dealer/Processor, or Other Interested Parties) that pertain to the nominee's experience. If the nominee fits into more than one category, answer the questions for all categories that fit the situation. **Also, please fill in the sections which pertain to All Nominees (pages 1 and 2). In addition, nominee signatures are required to verify the provided information (page 4), and Commissioner signatures are requested to verify Commissioner consensus (page 4). Please print and use a black pen.**

Form submitted by Chris Batsavage (your name) State: NC

Name of Nominee: Barbara Garrity-Blake

Address: 134 Shore Drive P.O. Box 91

City, State, Zip: Gloucester, NC 28528

Please provide the appropriate numbers where the nominee can be reached:

Phone (day): 252-342-8028 Phone (evening): _____

FAX: _____ Email: garrityblake@gmail.com

FOR ALL NOMINEES:

1. Please list, in order of preference, the Advisory Panel for which you are nominating the above person.
   1. Atlantic Menhaden
   2. _____
   3. _____
   4. _____
2. Has the nominee been found in violation of criminal or civil federal fishery law or regulation or convicted of any felony or crime over the last three years?

   ☐yes ☒no
3. Is the nominee a member of any fishermen's organizations or clubs?

   ☒yes ☐no

If "yes," please list them below by name.

_NC Catch (local seafood consumer education) _____

_____ _____

_____ _____

4. What kinds (species) of fish and/or shellfish has the nominee fished for during the past year?

_____ _____

_____ _____

_____ _____

5. What kinds (species) of fish and/or shellfish has the nominee fished for in the past?

_____ _____

_____ _____

_____ _____

FOR COMMERCIAL FISHERMEN:

1. How many years has the nominee been the commercial fishing business?

2. Is the nominee employed only in commercial fishing? ☐yes ☐no

3. What is the predominant gear type used by the nominee? _____

FOR CHARTER/HEADBOAT CAPTAINS:

1. How long has the nominee been employed in the charter/headboat business? _____

2. Is the nominee employed only in the charter/headboat industry? ☐yes ☐no

If "no," please list other type(s) of business(es) and/occupation(s): _____

3. How many years has the nominee lived in the home port community? _____ years

If less than five years, please indicate the nominee's previous home port community.

_____

FOR RECREATIONAL FISHERMEN:

1. How long has the nominee engaged in recreational fishing? _____ years

2. Is the nominee working, or has the nominee ever worked in any area related to the fishing industry? ☐yes ☐no

   If "yes," please explain.

   _____

FOR SEAFOOD PROCESSORS & DEALERS:

1. How long has the nominee been employed in the business of seafood processing/dealing? _____ years

2. Is the nominee employed only in the business of seafood processing/dealing?

   ☐yes ☐no
   If "no," please list other type(s) of business(es) and/or occupation(s):

   _____

3. How many years has the nominee lived in the home port community? _____ years

   If less than five years, please indicate the nominee's previous home port community.

   _____

FOR OTHER INTERESTED PARTIES:

1. How long has the nominee been interested in fishing and/or fisheries management? 25 years

2. Is the nominee employed in the fishing business or the field of fisheries management?
   ☐yes ☒no

   If "no," please list other type(s) of business(es) and/or occupation(s):

   Teach Marine Fisheries Policy at Duke Marine lab, did PhD research on anthropology of menhaden fishery, former member of the NC Marine Fisheries Commission

In the space provided below, please provide the Commission with any additional information which you feel would assist us in making choosing new Advisors. You may use as many pages as needed.

Nominee Signature: Barbara Garrity-Blake Date: 5/6/2022

Name: Barbara Garrity-Blake
(please print)

COMMISSIONERS SIGN-OFF (not required for non-traditional stakeholders)

Chris Batsavage
State Director

State Legislator

Governor's Appointee