Atlantic States Marine Fisheries Commission

Spiny Dogfish Management Board

January 23, 2024
2:45 – 3:45 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.

1.	Welcome/Call to Order *(P. Geer)*	2:45 p.m.
2.	Board Consent • Approval of Agenda • Approval of Proceedings from October 2023	2:45 p.m.
3.	Public Comment	2:50 p.m.
4.	Review 2023 Management Track Assessment *(J. Didden)*	3:00 p.m.
5.	Set Specifications for Up to the Next Three Fishing Years **Final Action** • Review Monitoring Committee and Mid-Atlantic Fishery Management Council Recommendations for the 2024-2026 Fishing Years *(J. Didden)*	3:15 p.m.
6.	Elect Vice-Chair **Action**	3:40 p.m.
7.	Other Business/Adjourn	3:45 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.

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

MEETING OVERVIEW

January 23, 2024
2:45 – 3:45 p.m.
Hybrid Meeting

Chair: Pat Geer (VA) Assumed Chairmanship: 1/24	Technical Committee Chair: Scott Newlin (DE)	Law Enforcement Committee Representative: Chris Baker (MA)
Vice-Chair: Vacant	Advisory Panel Chair: Vacant	Previous Board Meeting: October 18, 2023
Voting Members: ME, NH, MA, RI, CT, NY, NJ, DE, MD, VA, NC, NMFS (12 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from October 18, 2023

3. Public Comment – At the beginning of the meeting public comment will be taken on items not on the agenda. Individuals that wish to speak at this time 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. Review 2023 Management Track Assessment (3:00-3:15 p.m.)

Background

- The management track assessment is an update of the 2022 research track assessment, which had a terminal year of 2019. This assessment uses 2022 as the terminal year, extends the initial year to 1924 from 1989, and updated the stock projections through 2026. Based on the results, the stock is not overfished and overfishing is not occurring (**Briefing Materials)**.

Presentations

- Review 2023 Management Track Assessment by J. Didden

5. Set Specifications for Up to the Next Three Fishing Years (3:15-3:40 p.m.) Final Action

Background

- In December 2023, based on the advice of the Mid-Atlantic Council's Science and Statistical Committee, Advisory Panel, and Spiny Dogfish Committee, the Council voted to recommend a commercial quota of 10.7 million pounds for 2024, 11.0 million pounds

in 2025, and 11.2 million pounds in 2026. The 2024 quota is an 11% decrease from 2023 **(Briefing Materials)**. • The New England Fishery Management Council will also make quota recommendations in January 2024.
Presentations • Review Monitoring Committee and Mid-Atlantic Fishery Management Council Recommendations for the 2024-2026 Fishing Years by J. Didden
Board Actions for Consideration • Set specifications for the 2024-2025 fishing year

6. Elect Vice-Chair

7. Other Business/Adjourn

DRAFT PROCEEDINGS OF THE

ATLANTIC STATES MARINE FISHERIES COMMISSION

SPINY DOGFISH MANAGEMENT BOARD

Beaufort Hotel
Beaufort, North Carolina
Hybrid Meeting

October 18, 2023

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

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ATTENDANCE

Board Members

Megan Ware, ME, proxy for P. Keliher (AA)
Cheri Patterson, NH (AA)
Doug Grout, NH (GA)
Dennis Abbott, NH, proxy for Sen. Watters (LA)
Nicola Meserve, MA, proxy for D. McKiernan (AA)
Raymond Kane, MA (GA)
Sarah Ferrara, MA, proxy for Rep. Peake (LA)
Jason McNamee, RI (AA)
David Boredn, RI (GA)
Eric Reid, RI, proxy for Sen. Sosnowski (LA)
Justin Davis, CT (AA)
Craig Miner, CT, proxy for J. Gresko (LA)
Jesse Hornstein, NY, proxy for M. Gary (AA)
Emerson Hasbrouck, NY (GA)
Heather Corbett, NJ, proxy for J. Cimino (AA)
Jeff Kaelin, NJ (GA)
Adam Nowalsky, NJ, proxy for Sen. Gopal (LA)
John Clark, DE (AA)
Roy Miller, DE (GA)
Craig Pugh, DE, proxy for Rep. Carson (LA)
Michael Luisi, MD, proxy for L. Fegley (AA)
Russell Dize, MD (GA)
Pat Geer, VA, proxy for J. Green (AA)
Bryan Plumlee, VA (GA)
Chris Batsavage, NC, proxy for K. Rawls (AA)
Chad Thomas, NC, proxy for Rep. Wray (LA)

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

Ex-Officio Members

Staff

Bob Beal
Toni Kerns
Tina Berger
Madeline Musante
Tracy Bauer
James Boyle
Caitlin Starks
Chelsea Tuohy
Emilie Franke
Katie Drew
Jainita Patel
Kristen Anstead

Guests

Max Appelman, NOAA
Mike Armstrong, MA DMF
Richard Balouskus, RI DEM
William Barnhill, NMFS
Jessica Best, NYS DEC
Alan Bianchi, NC DMF
Jason Boucher, NOAA
Jeffrey Brust, NJ DEP
Michael Celestino, NJ DEP
Joseph Cimino, NJ (AA)
Karson Cisneros, MAFMC
Heather Corbett, NJ DEP
Jennifer Couture, NEFMC
Caitlin Craig, NYS DEC
Scott Curatolo-Wagemann, Cornell Cooperative Extension of Suffolk County
Jason Didden, MAFMC
Will DiMento
Julie Evans
Catherine Fede
Cynthia Ferrio, NOAA
Christine Ford, NOAA
Robin Frede, NEFMC
Beth Govoni, NC DMF
Joe Gresko, CT (LA)
Joseph Grist, VMRC
Jay Hermsen, NOAA
Amanda Higgs, NYS DEC
William Hoffman, MA DMF
Pierre Juillard
Ellen Keane, NOAA
Pat Keliher, MA DMF
Thomas Kosinski, Sandy Hook Outfitters
Brooke Lowman, VMRC
Chip Lynch, NOAA
John Maniscalco, NYS DEC
Daniel McKiernan, MA (AA)
Steve Meyers
Steve Minkkinen, US FWS
Patrick Moran, MA Environmental Police
Robert Moss, Commercial Striped Bass Assn.
Brandon Muffley, MAFMC
Allison Murphy, NOAA
Thomas Newman
Conor ODonnell, NH FGD
Danielle Palmer, NOAA
Robert Pellegrino, Plum Island Surfcasters
Michael Pierdinock
Janice Plante, NEFMC

Guests (continued)

Will Poston
Jill Ramsey, VMRC
Kathy Rawls, NC (AA)
Mike Ruccio, NOAA
Christopher Scott, NYS DEC
Somers Smott, VMRC
Mark Taylor
Taylor Vavra, Stripers Forever
Craig Weedon, MD DNR
Peter Whelan
John Whiteside
Alvin Williams
Brandon Wingate, Salt Tale Charters
Chris Wright, NOAA
Phil Zalesak
Renee Zobel, NH FG

The Spiny Dogfish Management Board of the Atlantic States Marine Fisheries Commission convened in the Rachel Carson Ballroom via hybrid meeting, in-person and webinar; Wednesday, October 18, 2023, and was called to order at 1:20 p.m. by Chair Nichola Meserve.

CALL TO ORDER

CHAIR NICHOLA MESERVE: We'll call the Spiny Dogfish Board meeting to order. Apologies to those online that we ran a little late at lunch, but we have some vitamin D coursing through our bodies now, and ready to get back and do business.

APPROVAL OF AGENDA

CHAIR MESERVE: Looking at our agenda, I think we'll be able to make up the time, perhaps not as quick as Erika Burgess got through the Coastal Sharks meeting yesterday, but we'll do our best to not delay Striped Bass. Looking at the agenda, is there any opposition to approving the agenda as is? Seeing none; we'll consider the agenda approved, and move on.

APPROVAL OF PROCEEDINGS

CHAIR MESERVE: Proceedings from our last meeting in August of 2023. Are there any clarifications, edits, corrections to those proceedings? Seeing none; we will consider them approved by consent.

PUBLIC COMMENT

CHAIR MESERVE: We're going to move on to Item 3, Public Comment. This is an opportunity for members of the public to comment on items that are not on the agenda. I don't see any hands in the audience, anything online, James? None online.

REVIEW ATLANTIC STURGEON FISHERY MANAGEMENT ACTION TEAM/PLAN DEVELOPMENT TEAM ALTERNATIVES

CHAIR MESERVE: We can move on to Item 4, which is to Review the Atlantic Sturgeon Fishery Management Action Team/Plan Development Team Alternatives.

We have Karson Cisneros from the Mid-Atlantic Council here to give us a presentation. The Commission is closely tracking this joint Council action, as there is an expectation that the Dogfish Board will be taking some complementary action, once that action gets a little bit further along. Without further ado, I'll go to Karson for her presentation.

MS. KARSON CISNEROS: Thank you, Madam Chair, hopefully everyone can hear me okay. I'll just give another minute to see if the slides pop up. But as noted, I'm going to give an overview of the Mid-Atlantic Council and New England Council's joint framework action to reduce sturgeon bycatch in the dogfish and monkfish fisheries. I'll basically be giving you all an update of the progress that has been made thus far.

There hasn't been any final action or anything. In terms of background on why this action was initiated. In 2021 there was a biological opinion issued by NOAA Fisheries as required by the Endangered Species Act, and this addressed several different FMPs. But one of the outcomes from that biological opinion, or BiOp was that Atlantic sturgeon bycatch must be reduced in several large mesh gillnet fisheries by 2024. To address the BiOp, NMFS formed the Atlantic Sturgeon Bycatch Working Group, and that group produced an action plan that recommended the Council process should be used to meet the needed reductions. Dogfish and monkfish were both identified as high contributors to the sturgeon bycatch, and they are both jointly managed by the New England and Mid-Atlantic Councils.

Then some of the potential measures to reduce sturgeon bycatch, that were recommended within that action plan were modifications to gear. Low profile gillnets have been tested in the monkfish fishery in New Jersey, and have been shown to reduce sturgeon bycatch. Then reductions in soak time, as well as focused time area measures, including closures in hotspot bycatch areas.

In response to this action plan conclusion, the councils each initiated a joint framework action earlier this year. In June, the councils did find out that the incidental take statement or ITS, was exceeded in gillnet fisheries, so there was an overage of sturgeon bycatch, and a new biological opinion has been reinitiated just last month.

This is kind of an evolving situation, but the previous 2021 BiOp is still active, and requires that bycatch reduction by 2024. But because of the timing, the new BiOp will likely use the current framework action as a baseline, instead of the current status quo condition. Currently, staff are working with GARFO through the FMAT/PDT that will sponsor this action, in order to share data and make sure that these processes are informing each other, and we're addressing the issue as needed.

This is just a quick overview of where the hotspot areas are for Atlantic sturgeon bycatch in gillnet fisheries. These were identified in the Action Plan and are based on observer data. The map on the left shows the Gulf of Maine and Southern New England, and then on the right the map shows New Jersey down through Virginia and Northern North Carolina.

The more pink and red area have the densest sturgeon and gillnet interaction. As you can see, there are some interactions in the Gulf of Maine and Southern New England, but the highest density hot spots are really off of New Jersey and the DelMarVa Peninsula on the right. In general, there are seasonable trends within these hotspots where there is a peak in interactions in the spring, closer inshore, and then a peak in the winter a little bit further offshore.

I mentioned the FMAT/PDT earlier. I just wanted to introduce the group a little bit. This is kind of the merging of the New England process of PDTs and the Mid-Atlantic process of Fishery Management Action Teams. On this team we have monkfish and dogfish and sturgeon expertise. We have representation from GARFO, including people from Sustainable Fisheries, Protected Resources, and NEPA.

Then we have Science Center expertise with the Observer Data, and sturgeon population dynamics, and then we have ASMFC staff, James Boyle represented on the team as well. This is the action timeline, and today's meeting is highlighted in green. At this point there have been several meetings, and these have been to really develop the early development of the range of alternatives. The FMAT and PDT formed and met in April, and then in May the dogfish and monkfish AP's and Committees met. Then in June the Councils met. During that first set of meetings, there were preliminary alternatives developed, and then the Councils decided in June that the Committee needed to meet again, to further refine the range of alternatives with more input from enforcement. Because of this, in September the FMAT and PDT and Committee met again to narrow the range of alternatives and refine them, and to keep with the action timeline and have a reasonable range of alternatives.

The New England Council approved the range of alternatives at their late September meeting, and then the Mid-Atlantic Council approved that same range at their meeting in early October, so just two weeks ago. Then since then staff and the FMAT/PDT are starting to analyze those alternatives and impacts, and starting development of that final framework document.

In late winter, so now we're on the other side of the green highlighted line of today's meeting. In late winter, likely February, there will be another set Advisory Panel for dogfish and monkfish, and Committee meetings to review the analysis and recommend those preferred alternatives. Then final action is scheduled for April of next year for both councils.

The requirement was to reduce sturgeon bycatch by 2024, so we anticipate rulemaking late in the year and implementation. Now we'll get into some of the types of measures that were developed for the

action. These were developed by the FMAT and PDT or by the Dogfish and Monkfish Committees.

The first one is gillnet soak time limits, and these would be in place within the hotspot areas during specific times of the year, where interactions are occurring. Different soak time options were considered, including no overnight soaks and maximums of 24-, 48- and 72-hour soak time. There were all these iterations that were originally considered, but there were concerns with soak times of 24 hours or greater, because those restrictions may not necessarily reduce the overall nets in the water, as the fishermen hauls back their net and then immediately resets it.
It was discussed that the action requires that sturgeon bycatch overall needs to be reduced, so not just bycatch mortality, because the shorter soak times can reduce bycatch mortality. Then in addition to that concern, the 24-hour soak times or greater did raise a lot of concern from enforcement representatives.

Ultimately, the only soak time restriction option that was kept in this action was no overnight soaks, since that would reduce nets in the water, and was deemed more enforceable. Preferably with a discrete ending time, instead of something like sunset, so a discrete ending time of 8:00 p.m. was proposed, and daytime hours can vary seasonally.

This was only kept in the dogfish range of alternatives, because the monkfish fishery requires multi-day soaks in order to operate. Then these soak times, daytime-only soak times were discussed in general, as more feasible in the New Jersey hot spot area, whereas in the southern Mid-Atlantic areas, fishermen have said that they need to keep the nets in overnight, so they may need to consider other measures.

Another option for reducing sturgeon bycatch in hotspot areas is the use of low-profile gillnet gear, which was described in the Action Plan. This would also be for specific times of year, when bycatch was high, and then those hot spot areas. This option has only really been researched in the Monkfish Fishery and in the New Jersey Region, where it has been shown to reduce sturgeon bycatch, while still maintaining monkfish catch. This type of net hasn't been tested for spiny dogfish or monkfish in the New England areas. Because of this, this is only included as an option for monkfish.

Lastly, small time-area closures are another option included in the range of alternatives to reduce bycatch, and these are included for both dogfish and monkfish. There were three different methods considered to capture those hotspot areas. These methods include drawing small polygons around the bycatch hotspots, using parallel lines to shore.

Another approach was using 10-minute squares to cover a hotspot area, and then a third approach was including the entire statistical area that contains the hotspot. There were pros and cons to each approach, but ultimately, the first option using parallel lines to draw the areas had the most flexibility, and was deemed more enforceable than the 10-minute square approach, which could create an area of more than four sides.

Then using entire statistical areas would include a large amount of area that was not considered a hotspot area, so that was considered too much of a burden on the fisheries, potentially without reducing more sturgeon bycatch. I won't go through all of these one by one, but this slide shows the final range of monkfish alternatives that were approved by both councils.

These alternatives include a low-profile net requirement or closures in the New Jersey hotspot area, and a closure option in the southern New England hotspot area. Then the southern New England closure has options in May and June, while the New Jersey timing of restriction or closure is December and May.

This is the range of dogfish alternatives that were approved by both councils. The types of restriction for dogfish are either no overnight soak or a time

area closure. There are options for these restrictions to be applied to hotspot areas in New Jersey, as well as hotspots off the coast of Delaware, Maryland and Virginia, and the timing of closures or restrictions for New Jersey is November, December and/or April.

For the southern Mid-Atlantic, the timing options are December, January and/or March. Some other considerations that have come up throughout the development of this action, are kind of listed on this slide. The Committee discussed the potential requirement of VMS in these fisheries, in order to increase enforceability of the different options, and potentially for some benefits of refining the hotspot areas in the future, or collecting further data.

Enforcement representatives did clarify that they would still be able to enforce the alternatives that were included in the final range, without a VMS requirement. The Councils ultimately felt it would be too large of a burden to the fisheries, so they didn't include a VMS requirement within the range of alternatives for either fishery.

Another consideration is that the sturgeon bycatch data needs to be updated for the hotspot analysis. Once that is done, hotspot area boundaries can be drawn more firmly. We're also planning to provide a state versus federal waters breakdown of the bycatch for these fisheries, because that has been requested by the Councils. Lastly, both Councils recommended future research on the use of data loggers as a tool to enforce gillnet soak time, and as well as the exploration of low-profile gillnet gear in the spiny dogfish fishery, and other regions beyond New Jersey for monkfish.

Further work in these areas can help enable the Councils to have more management tools in the future, if more sturgeon bycatch needs to be mitigated. Lastly, these are the next steps that I already touched on during the timeline slide. The Council staff, New England and Mid-Atlantic Council staff are both working with the FMAT and PDT to analyze the data and alternatives, and develop the framework document.

We have just gotten started on that. Around February, the dogfish and monkfish AP's will meet, followed by the joint Dogfish and Monkfish Committee, in order to recommend those preferred alternatives to the Council. Then both Councils will take final action at their April meeting. That is all I have.

CHAIR MESERVE: Great, thank you, Karson for that overview, a lot of great information there for the Board. Are there any questions for Karson on her presentation? I think you covered it excellently, Karson, there are no questions right now from the Board. I think the one thing that James and I wanted to discuss with the Board though is next steps for us on the matter. There is a question, David Borden.

MR. DAVID V. BORDEN: Question, Nichola. Could we go back to, I think it's Slide 3, where you put up the number of interactions. Yes, that. I'm a little bit concerned about the ITS being based on 2011 and 2015 observer data. Just for everyone's edification, I have nothing to do with the gillnet fishery. But I have listened to a lot of monk/skate discussions on this issue.

It is quite apparent that the gillnet fishery over the past ten years is totally contracting, in terms of the amount of gear that is used, number of gillnets out, where they're set, and so forth. If you use a time period going back to 2011 to '15, I'm afraid it may bias the results. I think it would be better to try to integrate some of the more recent effort data and fishery location information in the future.

CHAIR MESERVE: Karson, do you have any response to that about the years being incorporated in the new biological opinion?

MS. CISNEROS: Yes, I'm not sure of the exact years that the new BiOp that was just reinitiated will use, but for our action we will use through 2022, so all of

the bycatch and the sturgeon interaction of recent years will be used to draw the sort of boundaries and look at the trends. The ITS, the Incidental Take Statement that was developed, is kind of a limit that shouldn't be exceeded. That was derived from 2011 to 2015.

Then a look at recent years, so 2015 to 2021, is where there was quite a bit of an increase in sturgeon takes in the gillnet fishery in recent years. That is kind of what has triggered this new biological opinion, and definitely it kind of further emphasized the need for action. I hope that helps.

CHAIR MESERVE: Thank you, Karson. Any other questions, now that you've had a moment to let it marinade? Okay, seeing none; as I was saying, James and I wanted to bring up the potential for the Board's next action. It seems it's early at this point. There is a lot more detail that is going to be developed for the options in the range of alternatives.

We think that we'll be looking at the February of May meeting would be the time that the Board has some more information, and may start to think about initiating some type of complementary action for in-state waters for dogfish. As Karson said, we may have some more specific information about the bycatch proportion between state and federal waters to inform what this Board wants to do. That concludes this topic, and we can move on to the FMP review and State Compliance reports. We'll turn to James for that.

APPROVAL OF FISHERY MANAGEMENT PLAN REVIEW AND STATE COMPLIANCE FOR THE 2022-2023 FISHING YEAR

MR. JAMES BOYLE IV: I'm going to jump right in. I think I can go over this pretty quickly, so we can stay relatively on schedule. Good afternoon, everyone. I'll just jump right in. Here is just a very quick overview of the presentation. I'll start with a reminder of the status of the stock, which is still based on the 2018 stock assessment update.

Then I'll discuss the fishery in 2022-2023, and wrap up with the State Compliance, de minimis requests and PRT recommendations. The latest stock status information for management use still comes from the 2018 stock assessment update. Female spawning stock biomass is estimated to be 106,753 metric tons in 2018, which was above the threshold of 79,644 metric tons.

In 2017, fishing mortality on exploitable females was estimated to be 0.202, and has remained below the threshold level of 0.244 since 2005. A management track assessment was recently peer reviewed, and will be reviewed by the Mid-Atlantic Council's Science and Statistical Committee on October 30, and is scheduled to be presented to the Mid-Atlantic and New England Councils in December and January respectively.

In terms of the commercial quota and landings, the fishing year ran from May 1, 2022 to April 30, 2023. The quota was 29.56 million pounds and the trip limit was 7,500 pounds for the northern region states and commercial landings in total were approximately 12.6 million pounds, which is about a 28 percent increase from fishing year 2021 and 2022.

Recreational harvest was approximately 211,608 pounds in the fishing year 2022, which is about a 41 percent decrease in the previous fishing year. The dead discards were estimated to be about 2.5 million pounds, which is an 8 percent increase from 2021-2022 fishing season. All regions and state harvested within their quota, and all states implemented regulations consistent with the requirements of the FMP.

Under the spiny dogfish FMP, a state may be granted de minimis status upon request if landings are less than 1 percent of the coastwide landings. Both New York and Delaware requested and qualified for de minimis status. There are just a few PRT recommendations and comments. First thing, Connecticut did not meet the compliance report

deadline. Additionally, while every state satisfied the weekly reporting requirements through either SAFIS or NOAA Fisheries, a couple of states still did not provide the reporting regulations that show the requirement, and the PRT requests those going forward just for clarity. New York noted in their report that their finning regulations only apply to coastal sharks, but they are working to amend those to include spiny dogfish going forward.

Furthermore, the PRT maintained the note that the FMP gives a fairly broad definition of biomedical supplies for exempted fishing permits, and the states are reporting harvest under a variety of research and education purposes. While the reported harvest under these permits is well below the 1,000 fish limit, the PRT may require Board input on what type of harvest can count towards its limit in the future, should any state start to be near that 1,000 fish limit.

Finally, the PRT continues to recommend the Board consider the purpose of the current de minimis provision, given that all states must satisfy the only monitoring requirement, which is to report annual landings, regardless of de minimis status. With that, the Board action to consider today is the approval of the FMP Review and State Compliance Reports for the 2022-2023 fishing year, as well as the de minimis requests from New York and Delaware. With that I'm happy to take any questions.

CHAIR MESERVE: Are there any questions from the Board about the FMP Review? Seeing none; is there anyone that would like to make a motion? Ray Kane. Could you read it into the record please, Ray?

MR. RAYMOND W. KANE: Yes, **move to approve the Fishery Management Plan Review, State Compliance reports and De Minimis requests for Delaware and New York for the 2022-2023 fishing year**.

CHAIR MESERVE: Motion by Ray Kane, is there a second? John Clark, thank you**. Is there any opposition to the motion? Seeing none; we'll consider that approved.**

ADJOURNMENT

CHAIR MESERVE: Is there any further business to come before the Board today? Seeing none; I will consider us adjourned, and I'll look to Toni for any announcement about the next Board meeting.

(Whereupon the meeting adjourned at 1:45 p.m. on October 18, 2023)

2023 September Management Track Peer Review Panel Report

Adrian Jordaan (Chair)[1], Thomas Miller[2], and Yong Chen[3]

[1]University of Massachusetts Amherst, [2]University of Maryland Center for Environmental Scioence, [3]Stony Brook University

Executive Summary

Seven stock assessments were reviewed by the September 2023 Management Track peer review panel. Four of these were Level 2s Expedited Review: northern and southern red hake (*Urophysis chuss*), Atlantic mackerel (*Scomber scombrus*), and northern windowpane flounder (*Scophthalmus aquosus*), and three of these were Level 3 Enhanced Reviews: Acadian redfish (*Sebastes fasciatus*), skate complex, and spiny dogfish (*Squalus acanthias*). Levels of review were as recommended by the Assessment Oversight Panel (Appendix A).

The Peer Review Panel (Panel) for the September 2023 Management Track Assessments met via webinar on September 18-20, 2023. The Panel was to determine whether the completed management track assessment was technically sufficient to (a) evaluate stock status, (b) provide scientific advice and (c) successfully address the assessment Terms of Reference (Appendix B). Table 1 presents a list of the stocks, name of the lead analyst/presenters, and conclusions about stock status.

Attendance at the meeting is provided in Appendix C with the Agenda shown in Appendix D.

We thank Russ Brown (Population Dynamics Branch Chief) and Michele Traver (Assessment Process Lead) for their support during the meeting and to the staff of the Population Dynamics Branch at NEFSC for the open and collaborative spirit with which they engaged the Panel.

Our thanks also extend to the rapporteurs for taking extensive notes during the meeting and to staff of the Mid-Atlantic and New England Fishery Management Councils. Last, we thanks the analysts for their diligent and highly professional work in completing their assessments.

The Panel has suggestions for improvements that could be made for review of Management Track assessments:

1. The Panel suggests continued development of supplemental information, including age/length-frequency plots and comparisons between discards estimates broken down by gear and year, as these were important to interpretation of trends. The Panel recognizes that different analysts construct different assessment models, but there could be some future effort of identifying the best data visualizations for the similar data types.

The Panel also has several crosscutting recommendations with respect to the individual stock assessments:

1. Projections and ABC setting, and best practices around developing them remain a challenge. For example, the time-series of recruitment used to generate OFL projections. The time series used, or inclusion of autocorrection, in generation of recruitment could be considered during projections,. In other stocks, periods of exploitation rates where populations were viewed as stable were used to develop the ABC. The choice of time series length and what is deemed stable are ad hoc procedures, and this area would benefit from a Research Track effort to determine best practices that could guide PDT development of projections and advice setting during SSC deliberations, and lead to more consistency and transparency in the approach.
2. When empirical approaches are used in the assessment, there needs to be a standard set of procedures for setting ABCs. We saw four methods of setting ABCs in this process, based on SSC deliberations and from an FMP. The Panel recommends exploring 75 and 25 percentiles of historical biomass time series as an empirical target and limit reference points, respectively for the red hake stocks, although in the past a target exploitation rate of 1.5% was used. For the skate complex, the SSBmsy proxy is considered the 75th percentile of the survey, the ABC calculation uses the Median C/B by species*most recent 3-year moving average of the survey, and the MSY calculation is the Median C/B by species*Bmsy proxy. The development of BRPs, ABCs and projections in non-analytical assessments remains an important area of focus in Research Track Assessments or its own RT assessment with crosscutting recommendation #1 above.
3. Two stocks reviewed are in rebuilding plans but the analytical assessment failed in previous peer review and thus there is no way to understand if the stock is rebuilt, or if the reference points are current, given the potential productivity changes due to climate change and/or other factors. This is a consistent issue and needs to be addressed. Essentially, these are an extension of the short term projections into long term projections and how to know where the population is without a biomass and fishing mortality estimate.
4. Incomplete individual age matrices in Acadian redfish assessment, from catch and the spring survey, needs continued effort. Aging was an issue in multiple stocks, and samples that are on hand or future collection would aid in the assessment process.
5. The Catch Accounting and Monitoring System (CAMS) was implemented to provide a single source of commercial fishery data for quota monitoring and stock assessment. Stock assessment updates continue to check CAMS estimates against current or historical estimates of discards and harvest, where available to ensure that the differences remain negligible. In the assessment of northern red hake, the inclusion of lobster observer data based on 18 trips in 2021 and 22 samples (and CVs of 0.54 -0.80) contributed to elevated total removals. Because red hake catch is low, no impact occurred in the assessment, but details of discard estimates are important to include and flagging lower confidence values.
6. Figures for exploitation rates should be more explicit, for example if it is fully selected fishing mortality, then this should be the y-axis label.

Table 1. Stocks reviewed at September 2023 Management Track Assessment Peer Review.

Stock	Lead Analyst/Presenter	Peer Review Panel conclusion on Stock Status
Expedited Review		
Red hake (north)	Toni Chute	Stock's overfished status and overfishing status are both unknown. Biomass indices are high and the exploitation rate remains at low levels.
Red hake (south)	Toni Chute	Stock's overfished status and overfishing status are both unknown. Biomass indices are low and the exploitation rate remains at low levels.
Windowpane flounder (north)	Toni Chute	Stock's overfished status and overfishing status are both unknown. Biomass indices are at time-series lows and the exploitation rate remains at low levels. This is a discard fishery.
Atlantic mackerel	Kiersten Curti	Stock is Overfished and overfishing is not occurring. The stock is near time-series lows but closure of directed Canadian fishery and lower US catch resulted in not overfishing in the last year of the assessment.
Enhanced Review		
Acadian redfish	Brian Linton	The stock is not overfished and overfishing is not occurring. The stock is not being fully utilized and it appears unlikely that full utilization will occur unless market conditions change.
Skate complex	Kathy Sosebee	Stock's overfished status and overfishing status are both NA. BRP's are defined in past development of the Skate FMP, and these support an

Stock	Lead Analyst/Presenter	Peer Review Panel conclusion on Stock Status
		overfished status for Thorny Skate and recent overfishing in Little and Winter Skate.
Spiny dogfish	Dvora Hart	The stock is not overfished and overfishing is not occurring. Exploitation rates are relatively high and at the FMSY Proxy, thus it appears likely that catch will achieve ABCs.

Expedited Reviews

Red Hake

Red hake (*Urophysis chuss*) is a gadid species with relatively small maximum age and size (8 years, ~45cm). Red hake is managed as two separate stocks. The northern stock encompasses the Gulf of Maine and the northern flank of Georges Bank. The southern stock, also termed SNEMA, encompasses coastal waters of southern New England and the Mid-Atlantic and the eastern and southern flanks of Georges Bank. Data on both red hake stocks from 1981-2022 were evaluated. Catches of hake in both stock areas declined sharply between 1981-2000 and have since remained low. The northern hake stock abundance index was increasing late in the time series and the southern declining.

In 2020, an expert working group released a report on the structure of red hake in the northeast Atlantic (NEFSC. 2020). This report documented the assessment history of this stock. Evidence from distributional patterns, vital rates, otolith microchemistry and physical oceanographic factors was examined. The report concluded that the information available is " insufficient to reject the null hypothesis of two stocks." This finding was based on "clear evidence" of phenotypic stocks with clear trends in abundance. The report acknowledged the potential for exchange, particularly during early life stages, but the report concluded that evidence for exchange "did not provide a sufficient basis to reject the null hypothesis of two stocks."

The Panel does not wish to re-explore the question of whether or not there is sufficient evidence to support any specific stock structure. The Panel raises the issue of stock structure to identify an important source of uncertainty in the inferences drawn regarding stock status of both the putative northern and southern stocks, and as a necessary question towards understanding differing responses of the stocks to historical exploitation rates. If there are indeed two separate stocks, are there any exchanges between the two stocks, or are they isolated as is assumed in the current approach? Are there characteristic patterns, frequencies and magnitudes of exchanges between stocks that affect management? Are both putative stocks resilient, or does one serve more often as a source population subsidizing the other? Alternatively, if red hake lack the putative stock structure and are rather a single, well-mixed population, what is the importance of latitudinal differences in vital rates and the disparate spatial distributions documented? Would the stock structure be considered differently if the null hypothesis was a single population? The Panel recommended strongly continued research to resolve questions of stock structure in this species.

The two stocks of red hake also demonstrate a pattern in population trends that are consistent with climate change, with the southern stock declining and the northern stock increasing.

Northern Red Hake Stock

Previous assessments have applied an index method (AIM) to northern red hake as a part of the Research Track Assessment (RTA, NEFSC 2020). This was not successful, leading the peer review panel for the RTA to conclude that fishing was likely not the driver for changes in

abundance of northern red hake. Consequently, the 2020 Management Track Assessment (MTA, NEFSC 2022) brought forward an empirical approach based on estimating total swept-area biomass with model-based net efficiencies. This method does not produce reference points and accordingly the 2020 MTA did not determine stock status. The same method was used for the 2023 MTA and consequently stock status remains unknown. Indices developed from NEFSC Bottom Trawl Surveys (BTS) indicate that biomass is high, and relative exploitation rate is low.

The Panel concluded that the Term of Reference related to catch was broadly met. However, the Panel notes that discard estimates in 2021 and 2022 were approximately 4 times higher than estimates for earlier in the time series. This large increase stems from incidental catch of red hake in lobster pots in the Gulf of Maine based on federal observer coverage. These observations are based on a limited number of trips and more work is required to determine how representative they may be of the wider lobster fishery in the Gulf of Maine. If these discard estimates are supported by a broader examination of bycatch in the lobster fishery, discard mortality on northern red hake in the lobster fishery could have important implications for past catches, and our understanding of the pattern of exploitation of red hake. The Peer Review Panel (Panel) recommended efforts to more fully evaluate the discard estimates from the lobster fishery throughout the catch time series.

The Panel suggested considering using historical biomass and relative exploitation rates time series as potential reference points to gauge the stock status in relation to historical levels. For example, 75 and 25 percentiles of historical biomass time series can be considered as an empirical target and limit reference points, respectively. The development of BRPs, ABCs and projections in non-analytical assessments remains an important area of focus in research track assessments. Specific to northern red hake, relative exploitation rates are low and biomass is near time series highs. The stock ranges between 205-849 MT in total catch.

Nothing reviewed would cause the Panel to suggest a change to what the SSC decided during past setting of catch specifications, however, there is also not much support for the somewhat arbitrary use of the period of stable catches with a 1.5% exploitation rate. The Panel felt there were a number of times that catch could be viewed as stable, including the whole time series. Thus, the Panel suggests further thinking around what exploitation rate is appropriate for this stock, and considering constant catch levels since catch is low and biomass trends appear unrelated to fisheries removals.

Research suggestions

Analyze ME Department of Marine Resources (DMR) lobster sea sampling data which include groundfish bycatch to estimate potential red hake discards in the coastal GOM lobster fishery. Better understand potential discards and the mortality rates.

Identify possible drivers that led to reduced sizes at age over time as population growth. Potential drivers include density-dependent factors (e.g., changes in size/age at maturity) and environmental drivers (e.g., climate induced changes). Discussions of the differing responses of the stocks to historical exploitation rates should be useful, particularly if such discussions lead to more refined analyses of underlying causes.

A genetic study would help with understanding stock structure since there was little support in otolith microchemical studies thus far.

The sharp drop in the number of the larger (older) individuals is consistent throughout all the length frequency figures. Red hake are not a particularly large fish and this could reflect the slowing of growth as fish age and length frequency bins. Behavioral or size-dependent distributions, however, could introduce some bias. A starting point might be a comparison of size composition changes over depth and in discards.

Panel conclusions

The Panel concluded that the 2023 assessment update for northern red hake fulfilled the recommendations of the AOP, and is the Best Scientific Information Available. The Panel believes the Terms of Reference for the stock's assessment were broadly met. Catch was estimated from all sources including landings and discards. An abundance index was generated, broken down to strata and length frequencies provided. Annual fishing mortality, recruitment and stock biomass were not possible to estimate as a result of the assessment method for the time series. The same model was used as the last assessment. No BRP's are defined , nor any stock status provided. Temporal trends in length frequencies and a back up i-smooth option provided. No short-term stock projections were appropriate, although some different time series periods with different mean exploitation rates were provided and applied to the 3-year moving average swept-area biomass estimate of 221,920 mt. No more than 2% of the stock has been removed annually since the 1980s and it will be difficult to justify an appropriate time period for the exploitation rate. Most previous comments in past peer reviews or SSC concerns from the most recent assessment will require a research track assessment to explore another framework, likely once improved estimates of M, selectivity, and recruitment, and an expanded time series become available.

Southern Red Hake Stock

Previous assessments have applied an index method (AIM) to southern red hake as a part of the Research Track Assessment (RTA, NEFSC 2020). This was not successful, leading the peer review panel for the RTA to conclude that fishing was likely not the driver for changes in abundance of southern red hake. Consequently, the 2020 Management Track Assessment (MTA, NEFSC 2022) brought forward an empirical approach based on estimating total swept-area biomass with model-based net efficiencies. This method does not produce reference points and accordingly the 2020 MTA did not determine stock status. The same method was used for the 2023 MTA and consequently stock status remains unknown. Indices developed from NEFSC Bottom Trawl Surveys (BTS) indicate that biomass is low, and relative exploitation rate is low.

The Panel discussed the small footprint of the red hake southern stock relative to the survey area, as viewed in the distributional maps. This stock is not experiencing overexploitation but is still declining, leading to concerns about the interpretation of the survey index. Data to inform stock structure remains uncertain. The biggest case for separation is the division is historical growth and different index trends. But whether these data can support the division of fish caught on

Georges Bank into allocations to two stock areas remains unclear. The Panel still views the stock structure as a potential source of uncertainty.

The Panel concluded that the Term of Reference related to catch was met. Catch is low and biomass trends appear unrelated to fisheries removals.

The Panel concluded that the Term of Reference related to abundance indices and life history was met.The index is statistically sound, but missing stations and in particular spring survey issues could have impact on estimates and map of center of gravity.

The Panel questioned the feasibility in evaluating a rebuilding plan with a rebuilding F and rebuilding biomass without management reference points.The Panel suggested considering using historical biomass and relative exploitation rates time series as interim reference points to gauge the stock status in relation to historical levels. For example, 75 and 25 percentiles of historical biomass time series can be considered as an empirical target and limit reference points, respectively.

The Panel suggested an investigation of the causes that resulted in a southern stock declining and northern stock increasing. Climate change may be one of the causes that need to be evaluated. but the mechanism could be the result of either differential production and survivorship or from migrations.

Research suggestions

Many of the same research recommendations were reiterated from the northern stock. Comparisons between northern and southern stocks and look for inconsistencies between biomass trends and survey indices, recruitment? Timing of the survey in the south could greatly impact the index due to the phenology of fish migrations.

Panel conclusions

The Panel concluded that the 2023 assessment update for southern red hake fulfilled the recommendations of the AOP, and is the Best Scientific Information Available. The Panel believes the Terms of Reference for the stock's assessment were broadly met. Catch was estimated from all sources including landings and discards. An abundance index was generated, broken down to strata and length frequencies provided. Annual fishing mortality, recruitment and stock biomass were not possible to estimate as a result of the assessment method for the time series. The same model was used as the last assessment. No BRP's are defined , nor any stock status provided. Temporal trends in length frequencies and a back up i-smooth option provided. No short-term stock projections were appropriate, although some different time series periods with different mean exploitation rates were provided and applied to the 3-year moving average swept-area biomass estimate of 53,968 mt. Exploitation rates appear low and it will be difficult to justify an appropriate time period for the exploitation rate. Most previous comments in past peer reviews or SSC concerns from the most recent assessment will require a research track assessment to explore another framework, likely once improved estimates of M, selectivity, and recruitment, and an expanded time series become available.

Atlantic mackerel

Atlantic mackerel (*Scomber scombrus*) is a broadly distributed pelagic fish species. Atlantic mackerel school and grow to a maximum of around 40 cm. Atlantic mackerel is considered a unit stock, with two spawning contingents, a southern contingent spawns in April and May in U.S. waters and a northern contingent spawns in June and July in the Gulf of St. Lawrence. The Canadian directed fishery was closed in 2022 in response to lowest estimated spawning stock biomass on record, and US removals were also low. The result is that the past year had low fishing mortality.

The mackerel assessment was originally a level 1 for direct delivery to the SSC. Changes in the assessment, driven by the addition of 2022 data (i.e. new data during a fishery closure, not changes to the assessment model parameterization), resulted in the updated model suggesting a change in status, which resulted in an upgrade to a level 2 assessment for this Management Track peer review. The primary assessment model for the Atlantic mackerel stock is ASAP. The model uses a constant M of 0.2 and one fishing fleet with a flat topped selectivity (1 at age 6 y). A range-wide egg survey that combines a targeted effort by Canada and the ECOMON survey in the United States provides an important index of SSB. In the assessment, the SSB index is complemented by data from the spring bottom trawl survey (ages 3+, dome-shaped selectivity) for each of the Albatross years (1974-2008) and Bigelow years (2009+). Long-term projections for BRPs are based on empirical CDF derived using recruitment estimated from 1975 onward. In the last assessment, the Fmsy proxy (F40%) was 0.22, and thus the stock was overfished (24% MSY proxy) and overfishing was occurring (208% of FMSY proxy). The stock is in a rebuilding plan with $F_{Rebuild}$ 0.12, using a two stanza recruitment to limit highest recruitment to larger stock sizes.

The Atlantic mackerel stock is overfished and overfishing is not occurring with a small but not insignificant retrospective pattern. The not overfishing status is the first such designation for this species in almost 20 years. There is age truncation in the population. Recruitment patterns suggest recruitment overall is low and there has been a greater relative recent contribution of the southern contingent to egg production (and presumably recruitment)..

The Panel was concerned how the fit to the abundance index shows systemic positive and negative patterns over time and the potential this is an indication of process errors that is not fully captured in the current stock assessment model. The Panel encourages the continued development of a state-space model such as the WHAM model to attempt to better deal with changing ecosystems.

The Panel recognizes the importance of the Canadian egg surveys and the US ECOMON survey to develop the egg production SSB index. This could be improved on the US side by additional

sampling during the mackerel peak spawning, earlier than when the current ECOMON survey is conducted. Efforts are currently underway to collect spawning mackerel from the southern contingent to provide updated fecundity estimates. These could improve the assessment in the future.

This stock utilized an SSB-based recruitment time-series in short-term projections in which low SSBs (less than ½ reference pt) produced a truncated time series where large past recruitments are not possible until SSB > 1/2 reference point, at which point the full time series is used. The Panel appreciated the thought that went into this as it represents a method of recognizing both the recent productivity that is more likely and the possibility of large recruitment possible at larger SSB values. However, a feeling that projections were optimistic remains, Past projections have similarly been shown to be optimistic. Another key uncertainty is the Canadian closure of the fishery and the likelihood it will remain in effect over the intervening time until another assessment and SSC deliberation occur.

Research suggestions

The Panel encourages the continued development of a state-space model such as the WHAM model to attempt to better deal with changing ecosystems. In addition, continued attention to the recruitment time-series and attempting to limit the optimistic projections either using shorter time series, or autocorrelation, to maintain lower recruitment. Part of the higher projections could be explained by higher R/SSB values in the last few years.

There is evidence of size-varying M. The Panel suggested that this be evaluated in future stock assessment.

The Panel thought efforts to develop a predation pressure index may be useful for this and other stocks, however the changing demographics and areas of spawning/young of year habitat may influence which predators contribute most to predation pressure.

Better delineation of the stock structure (using genetics) is needed.

Panel conclusions

The Panel concluded that the 2023 assessment update for Atlantic mackerel fulfilled the recommendations of the AOP, is technically sufficient to evaluate stock status and provide scientific advice and meets the Terms of Reference for the stock's assessment. Catch was estimated from all sources including landings and discards. An abundance index was generated, and an ASAP model used including bridge runs to last assessment that used the same modeling framework. Annual fishing mortality, recruitment and stock biomass were estimated, as well as BRP's. The stock is overfished but overfishing is not occurring and there is a minor retrospective pattern that did not justify any rho-adjustment. Short-term stock projections were appropriate, and since the stock is in a rebuilding plan used the $F_{Rebuild}$ (F=0.11), recommending 6864, 8571,

and 9830 mt in 2024, 2025 and 2026, respectively. There is a consistent pattern of optimistic projections, and longer term projections reflect this, suggesting that catches could double by 2029. Exploitation rates remain variable and the spawning stock biomass near the all time low. It appears likely that catch will be close to the ABC. A better understanding of how abundance indices are tracking the population (Tor 6) and estimation of a stock-recruit relationship remain as carry over recommendations.

Northern windowpane

Windowpane flounder are a small flatfish species that does not grow larger than 40cm in length, with most achieving 35cm length. Historically maximum age was up to 12 years old, although maximum age is now closer to 8-9 yr. Males are often the largest and oldest in the population. Catches were much higher prior to 1994, but fell precipitously and since the year 2000 the stock is primarily a discard fishery.

The stock was last assessed in 2020 using data through 2019. The application of the AIM model was discontinued in the 2019 assessment update because the fit was poor, although the AIM model continues to be used for the southern windowpane stock. Consequently, the 2020 Management Track Assessment (MTA, NEFSC 2022) was brought forward as an empirical approach based on estimating total swept-area biomass with model-based net efficiencies. This method does not produce reference points and accordingly the 2020 MTA did not determine stock status. The same method was used for the 2023 MTA and consequently stock status remains unknown. Indices developed from NEFSC Bottom Trawl Surveys (BTS) indicate that biomass is low and currently the abundance index is at a record low for the time series, and the relative exploitation rate is low.

The Panel was concerned about the potential for unaccounted mortality in discards. The stock has continued to decline while under low fishing pressure, in contrast to the southern stock that has stabilized, thus it is likely that there is unaccounted mortality or an unknown population process. We are not seeing recruitment materialize into the population.

This stock suffers from not having an analytical model that allows for estimating reference points to determine stock status. This is one of a number of current stocks that are in rebuilding plans but where the analytical assessments have not passed peer-review. For these stocks it is not clear if (1) the BRPs and rebuilding targets from past analytical assessment should be maintained, (2) the relevance of any such past values given the inability to understand present status, and (3) how to approach rebuilding without current status in setting current ABCs.

Research suggestions

There appears to be some unaccounted mortality, likely in discards, that possibly explains for the dichotomy between the low relative exploitation rate and lack of response by the stock.

Additional research on windowpane discards, likely in the scallop dredge fishery or recreational catches, are warranted. This research could include better accounting of current bycatch and development of fishery practices that limit discards.

Mentioned above in the cross cutting themes, there needs to be some broader work, perhaps its own RT assessment, on the time-periods used for determining exploitation rates that had a stable population.. This stock and the two hake stocks all had similar issues.

Panel conclusions

The Panel concluded that the 2023 assessment update for northern windowpane fulfilled the recommendations of the AOP, and is the Best Scientific Information Available. The Panel believes the Terms of Reference for the stock's assessment were broadly met. Catch was estimated from all sources including landings and discards. An abundance index was generated using the fall survey due to limited catches in the spring, broken down to strata and with annual length frequencies provided. Annual fishing mortality, recruitment and stock biomass were not possible to estimate as a result of the assessment method for the time series. The same model was used as the last assessment. No BRP's are defined , nor any stock status provided. A back up i-smooth option provided. No short-term stock projections were appropriate, although some different time series periods with different mean exploitation rates were provided and applied to the 3-year moving average swept-area biomass estimate of 7094 mt. Exploitation rates appear low and it has been difficult to justify an appropriate time period for the exploitation rate in past SSC deliberations. The stock is in a rebuilding plan and biomass is decreasing even though catches have been low. The lead analyst suggested basing catch advice on the exploitation rates from recent years for that reason as they most likely reflect the current condition of the stock. The Panel concurs that this is likely the best approach, although 3 time series (2010-2022, 2009-2022 and 1995-2001) all produced exploitation rates between 1.759 and 1.948% leading to a catch between 125 and 138 mt. Most previous comments in past peer reviews or SSC concerns focussed on the time period used and the associated exploitation rate.

Enhanced Reviews

Acadian Redfish

Acadian redfish (*Sebastes fasciatus*) is a species with a long life history that makes them more susceptible to overfishing and slower to recover. The species is a live bearer which complicates our understanding of stock and recruitment relationships. A fishery occurs in deeper water in the center of the Gulf of Maine. Catch remains low with 2023 at 1,813 mt.

Management advice for redfish is based on an 2008 GARM III ASAP model, updated in 2020, and again in this assessment. Mohn's Rho adjusted 2022 F and SSB were within 90% CIs of unadjusted values from the 2023 Base model, and thus no Rho adjustment was applied.

The model estimated Biological Reference Points for Acadian redfish with the Fmsy proxy of 0.037 and SSBMSY 184,322 mt, both values slightly lower than the past assessment. These

values were used in projections, thus for the 2024-2026 Forecast used the FMSY proxy of F50% (0.037). Recruitments drawn from empirical CDF (1969-2020) for projections. Current catch for 2023 is significantly below the FMSY proxy at 0.006, and thus it seems unlikely that catch in the projection time period will exceed the BRP.

The Panel discussed the impact of the lack of age data and performance of the models in relation to the age residuals, noting that during big changes in biomass the model has a hard time estimating values. Comments regarding the appearance of older fish during the recent increase in biomass, and the very unlikely scenario that biomass changes are biologically realistic (e.g. mass die-off of deep water fish), leads to the conclusion that biomass changes more likely result from a population process such as migration (Frisk et al. 2010) than from population dynamic responses. Canadian data are missing in general for the stock, and should be evaluated in future assessments both for potential catch, and for trends in surveys that might support movement among stocks.

Lack of age data in many years is a major source of uncertainty in the assessment. Samples for ageing have been collected for the entire period but many have not been processed. Additional commercial age data for 1986–2016 and for years post 2017 would be likely to decrease uncertainty in the next assessment. Discard estimation is available for Acadian redfish, but age composition is not available and not reflected in the fishery age composition data, which may influence the estimation of selectivity. However, because the amount of discard is relatively small, such impacts are not expected to be large.

Many groundfish stocks in the Northeast US have experienced reduced productivity. This species demonstrates an opposite pattern with an increase in predicted recruitment at the end of the time series. It is unknown if the increasing trends will be sustainable into the future and and/or if this resulted from possible overestimation in the assessment.

Research suggestions

The Panel suggested that temporal variability in weight at age be evaluated.

SSB and recruitment were estimated in the assessment. The Panel suggested exploring possible stock-recruit relationships internal or external to the stock assessment model, but also to consider the way recruitment was modeled with a linear ramp from 0.1 in 1964 to 0.8 in 1969, and then a linear ramp from 0.8 in 2017 to 0.52 in 2019. It is unclear how these CVs play out in the model results and how they would be adapted in more work on the S-R relationship.

The Panel recommended that a genetic study and/or tagging study be conducted to investigate transboundary stock movements, but initial explorations could look for signals in age frequencies or Canadian Survey data.

Given the large change in the ecosystem, the Panel suggested considering moving to WHAM or a state-space model which can accommodate large process errors occurring in the ecosystem and the Panel suggested that static M and age at maturity assumptions in the current stock assessment be evaluated.

Panel conclusions

The Panel concluded that the 2023 assessment update for Acadian redfish fulfilled the recommendations of the AOP, is technically sufficient to evaluate stock status and provide scientific advice and meets the Terms of Reference for the stock's assessment. Catch was estimated from all sources including landings and discards. Abundance indices were generated, and an ASAP model used including bridge runs to last assessment that used the same modeling framework. Annual fishing mortality, recruitment and stock biomass were estimated, as well as BRP's. The stock is not overfished and overfishing is not occurring. Short-term stock projections were appropriate, recommending 11,041, 10,900, and 10,998 mt in 2024, 2025 and 2026, respectively.. Exploitation rates appear low and it appears likely that catch will not achieve the projected catch. Most previous comments in past peer reviews or SSC concerns from the most recent assessment focus on aging and the need for more age data. Additional age data was included in this assessment, and there will be more aging of missing years in the future. A better understanding of how abundance indices are tracking the population (Tor 6) and estimation of a stock-recruit relationship remain as carry over recommendations.

Skate complex

The skate complex was last assessed in the 2008 Data Poor Workshop. This represents the first time the Skate complex has been through a management track assessment process. Seven species of skates form the skate complex: Winter Skate *(Leucoraja ocellata)*, Barndoor Skate *(Dipturus laevis)*, Thorny Skate *(Amblyraja radiata)*, Smooth Skate *(Malacoraja senta),* Little Skate *(Leucoraja erinacea)*, Clearnose Skate *(Raja eglanteria)* and Rosette Skate *(Leucoraja garmani)*. Winter skate, barndoor skate and thorny skate are all considered large skates over 100 cm in size at maturity, while little skate, clearnose skate, smooth skate, and rosette skate all are under 100cm at maturity. All skate species are found offshore, while winter, thorny, smooth, clearnose and little skates can also be caught inshore. The distributions of the skates are slightly different among species with clearnose and rosette skates confined mainly to the mid-Atlantic.

The assessment used an index-based approach and all the skate species are considered data poor, with the fishing mortality RPs based on the average CV of the survey. The Bmsy proxy is the 75th percentile of the survey through 2022 for 6 species, but is set at the 1963-1966 average biomass for barndoor skate. The ABC calculation uses the Median C/B by species multiplied by the most recent 3-year moving average of the survey, and the MSY calculation is the Median C/B by species multiplied by the Bmsy proxy. The spring survey is used for little skate and the fall survey

Due to challenges of skate identification over time in catches particularly as when skates were pooled as mixed skates, and due to the lack of price difference among the species there is no incentive to collect species-level landings data. Landings were generally not reported by species, with over 99% of the landings reported as “unclassified skates" until the FMP was implemented

in September of 2003. Identification in the observer program has been historically inaccurate but is improving over time. Therefore, a method was developed to assign both landings and discards to species. For landings, the length frequencies from all species were assigned to bait or wing based on a 60 cm split (<= 60 = bait and >= 61 cm = wing). These lengths were used to derive total length frequencies by half year and area (GOM, GB, SNE, and Mid-Atlantic). For discards, the same procedure was applied by gear, half year and area. The proportions at length from the surveys were applied to these length frequencies to derive species composition in number and weight. These calculations were conducted for 1994-2022, the time period when length frequencies were routinely collected by the observer program. An adjustment was made for the possession prohibitions for barndoor skate, thorny skate and smooth skate starting in 2004 and then allowing for barndoor landings starting in 2018. To get the species composition prior to 1994, the biomass by species was applied to the landings and discards by area and half year. This may overestimate landings of smaller species in the wing fishery and smaller species discarded in the longline and gill net fisheries. A January 14th, 2008 Memo to the SSC details the process, summarized here (See Appendix E).

CAMS shows a similar pattern in discards to the past Stock Eff method but deviates by as much as 10% in the same year. For the stock status in the last few years, two-year averages were used since the 2020 spring and fall surveys did not occur. This was 2021-2022 for all species. Since the 2023 spring survey was not considered to be representative for any species, this will be an issue for the next update.

The Panel was concerned over the level of uncertainty in this assessment. There was a sequence of decisions that were necessary to allocate total catch and discards to the species owing to the past mis-identification of species, the use of two mixed skate categories, and the way landings data are collected . These decisions, while acknowledged as needed to produce the assessment and completed by an expert on this stock, likely add compounding errors to the assessment that are not fully captured in the indices CIs. Simulations on key decisions would help to uncover any biases or areas where uncertainties are important. Potential concerns could be improvements in ID of species over time that allocate them to species differently,

The Panel also was concerned about the overfishing definitions used for the stocks, and spent time looking at reference materials to understand the underlying scientific basis (see Appendix E). The use of a strict overfishing definition with the high uncertainty in catch and discards could lead to issues in SSC deliberations and make the setting of specifications challenging. Overfishing reference points make a strong assumption that these species are controlled by fishing. Looking at survey mean weight per tow there is clear evidence that fishing is not the only driver, could be climate, or geographic shifts, etc. The biomass trends and projections (with potential ABCs) for the skate will remain detached from the stock status of each species.

The Panel also thought that looking at a correlation matrix of all the species indices would help define potential commonalities in response. These analyses should include Canadian data.

There were few estimates of discard mortality available, and those that were suggested that discard mortality is lower than the default 0.5 rate. However, there is also reason to believe that the rates could be quite a lot higher in certain fisheries. Another place where a simulation could be informative to potential biases in the results, particularly for Thorny skate which are a discard only fishery.

Research suggestions

Species ID remains an issue with this stock complex. Determining the best strategy to provide a quick and accurate ID of the species is still needed, and may require an update to the dichotomous key used in Bigelow and Schroeder.

Maturity and age data would help with understanding the SSB and prevalence of age 1 fish, respectively. There are substantial vertebrae available for aging and this data would be useful for future assessments.

Moving to either a stock synthesis or length-based model that provides status information, if even for only little and winter skates, as they are the dominant catch, would improve the assessment and should be considered in future efforts. Length-based models for little skate have been developed previously.

Simulation of the assumptions for splitting stocks and the 0.5 discard mortality rate to see impact on results, and to identify deficiencies and help the SSC better understand the uncertainty and potential biases.

Size morphs in thorny skate should be ID'ed, if important for management (different life histories assumed), using clasper/cloaca measurements at size

Potential interactions with offshore wind infrastructure, particularly as it relates to the behavioral and distributional responses of skates to EMF radiation associated with electricity conduction, should be evaluated.

Panel conclusions

The Panel concluded that the 2023 assessment for the skate complex fulfilled the recommendations of the AOP, and is the Best Scientific Information Available. The Panel believes the Terms of Reference for the stock's assessment were broadly met. Catch was estimated from all sources including landings and discards. An abundance index was generated, broken down to strata and length frequencies provided. Annual fishing mortality, recruitment and stock biomass were not possible to estimate as a result of the assessment method for the time series. The same model was used as the last assessment. BRP's are defined in past development

of the Skate FMP, and these support the low stock status for thorny skate and recent overfishing in little and winter skate. The official overfishing and overfished status for the complex is NA. ABC options were provided based on C/B using commercial and commercial and recreational landings from over 1981-2022 and a shorter time series (1994-2022) and these seem appropriate for SSC deliberations. Another modeling framework could improve this assessment, but age and growth studies are needed.

Spiny dogfish

Atlantic spiny dogfish (*Squalus acanthias*) is a relatively small shark species with sexual dimorphism in growth and size at maturity. Males grow up to 3.3 feet in length and reach sexual maturity at age 6 yr, whereas females grow up to 4 feet and reach sexual maturity at 12 yr Spiny dogfish reproduce in winter in offshore waters and females birth live offspring. Females produce between two and 12 pups per spawning season that require 18 to 24 months of gestation. The slow life histories demonstrated by spiny dogfish suggests that there are significant lags before recruitment enters the fishery and, combined with broad movements demonstrated in past research (Sulikowski et al. 2010) and high inter-annual variability in the exploitation rate, suggest significant uncertainty about the stock dynamics.

Atlantic spiny dogfish stock assessment presented is an update to the research track assessment completed in 2022, which used 2019 as the terminal year. This assessment added commercial and recreational catch data, survey indices of abundance, and assessment models through 2022, as well as initializing the model starting in 1924 instead of 1989, in order to satisfy the need of the SS3 model to start at an equilibrium point.

The Panel was concerned about the potential decline in size-at-maturity and overall lengths of females affecting offspring fitness. It is unknown whether the smaller size would impact a maternal effect (i.e., quality of offspring declines with spawners' size). While recruitment survival is implicitly estimated by the model and would not be affected by a possible declining pups' survival rates, the estimation of the F 60% SPR may be implicitly affected. More studies may be needed to evaluate the impacts of possible declining size-at-maturity.

Discards, once again, form one of the biggest sources of uncertainty, particularly when extrapolating discards pre-1989, and the 1990s with low trip coverages. The assumptions are more uncertain as we go back in time. A sensitivity was performed assuming discards were 100% higher in the past, which was considered extreme. This led to a higher biomass estimate as we essentially assumed more catch in the past and a greater potential stock productivity. This led to a large concern in using data back to 1924. It is understood that SS3 tends to perform better with an equilibrium population assumption at the beginning of the time series, although the shorter time-series performed very similarly. Using data back to 1924 is considered a better option than starting in 1989, if concerns about an equilibrium starting point are the focus. However, the reverse is true if concerns about discards and accurate catch histories are greater. While the Panel found the similar estimates regardless of data series reassuring, there was an unease

about using the longer data series given the high levels of uncertainty in catch prior to the 1980s.

There are a large number of zero-size bins in the two tails of size composition data, which may greatly increase the weights of size composition data in model fitting. The Panel suggested that a dynamic binning approach be explored to reduce the weighting of zero-size-bin data in modeling.

The choice of likelihood weighting factor, lambda, affects the status determination. Even with increased lambda, the fit to the spring survey was not that great, and this is worrisome to the Panel. Because the decline in spawning output was reasonably captured, the model is capturing some real trends in spawning output. Further, there was good support for the lambda= 6 model in the fit, but also in the treatment of the Albatross and Bigelow time series. However, even the proposed model suggests overfishing has been occurring for all years except 2022. Thus, the Panel has some concerns this stock will re-enter an overfishing point soon. Still, the survey index fit, and catchability estimates agreeing with the empirical estimate suggest the correct lambda was used.

Research suggestions

We encourage more thought about non-equilibrium starting points in the SS3 modeling framework.

Aging is again a major source of uncertainty, in particular because it is likely growth has changed over the past decades.

Panel conclusions

The Panel concluded that the 2023 assessment update for spiny dogfish fulfilled the recommendations of the AOP, is technically sufficient to evaluate stock status and provide scientific advice and meets the Terms of Reference for the stock's assessment. Catch was estimated from all sources including landings and discards. An abundance index was generated, and an SS3 model used including bridge runs to last assessment that used the same modeling framework. Annual fishing mortality, recruitment and stock biomass were estimated, as well as BRP's. The stock is not overfished and overfishing is not occurring. Short-term stock projections were appropriate, recommending 7818, 7956, and 8085 mt in 2024, 2025 and 2026, respectively. Exploitation rates are relatively high (F=0.025, at the F_{MSY} Proxy) and it appears likely that catch will achieve the projected values. Most previous comments in past peer reviews or SSC concerns from the most recent assessment focus on aging and the need for more age data.

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Appendix A. Summary of Assessment Oversight Panel Meetings for September 2023 Management Track Stock Assessments

The NRCC Assessment Oversight Panel (AOP) met to review the operational stock assessment plans for the skate complex, northern and southern red hake, Acadian redfish, northern and southern windowpane flounder, and northern and southern silver hake/offshore hake stocks on May 22, 2023. Three assessments were recommended for Level 1 Reviews (Direct Delivery) and these assessments will undergo an internal review before being delivered to the appropriate management body. The assessments for stocks/species recommended for Level 2 and 3 peer reviews will be reviewed during a meeting September 18-22, 2023.

The AOP consisted of:
Chris Legault, Ph.D. (AOP Chair), Northeast Fisheries Science Center, Woods Hole, Massachusetts.

Gary Nelson, Ph.D., representing the Atlantic States Marine Fisheries Commission, Massachusetts Division of Marine Fisheries.

Lisa Kerr, Ph.D., Chair of the NEFMC Scientific and Statistical Committee, Gulf of Maine Research Institute.

Paul Rago, Ph.D., Chair of the MAFMC Scientific and Statistical Committee, NOAA Fisheries (retired).

Meeting Details:
These meetings were guided by the NRCC-approved stock assessment guidance documents. Three background documents were provided to the Panel: (1) an updated prospectus for each stock; (2) an overview summary of all the salient data and model information for each stock; and (3) the NRCC Guidance memo on the Operational Assessments. Prior to the meeting, each assessment lead prepared a proposal for their Management Track Assessment. The proposal reflected the research track or most recent assessment results, the peer review panel Summary Report results and any initial investigations conducted for the management track assessment.

At the meeting, each assessment lead gave a presentation on the data to be used, model specifications (if applicable), evaluation of model performance, the process for updating the Biological Reference Points, the basis for catch projections, and an alternate assessment approach if their analytical assessment was rejected by the peer review panel.

Major Recommendations for Review of Individual Stocks:

In general, the AOP approved the plans presented, but recommended several points of emphasis to the recommended review levels as summarized below. AOP guidelines can be found in the stock assessment process document.

Stock	Assessment Lead	Review Level	Rationale and Comments
Skate Complex	Kathy Sosebee	Level 3	**Rationale:** First time through MT process, species identification issues, add recreational catch, new methods for catch by species, examine new surveys, consider new reference point for thorny skate
Red Hake (North and South)	Toni Chute	Level 2 (both stocks)	**Rationale:** Fishing does not appear to be driving trends in the population recently, missing 2020 surveys, CAMS catch, swept area biomass survey values same as 2020, stocks trending in different directions, MRIP data has high PSEs
Acadian Redfish	Brian Linton	Level 3	**Rationale:** Evaluate splitting the Albatross-Bigelow survey time series, reweighting model components, CAMS catch, tow-specific swept-area survey values, aging backlog, explore fishery selectivity changes if enough age data, examine possible change in growth over time
Windowpane Flounder (North and South)	Toni Chute	Level 2 (North) Level 1 (South) - provisional on status change	**Rationale:** Explore dk ratios over time, CAMS catch, possible incidental mortality in scallop dredge fishery, northern stock in a rebuilding plan, important bycatch in scallop fishery, consider using chainsweep experiment results for southern stock, explore scenarios for deciding years of exploitation rate for northern stock
Silver/Offshore	Jason	Level 1 (both	**Rationale:** CAMS catch not different,

Stock	Assessment Lead	Review Level	Rationale and Comments
Hake (North and South)	Boucher	stocks)	not overfished not overfishing for both, 2020 surveys as missing, consider time period for reference points (not obvious how to do this), stock ID question would require a research track

Individual Stock Discussion Summaries:

Skate Complex (AOP Lead: Lisa Kerr)
Recommendation: Level 3 (Enhanced Review)

The skate complex is currently assessed using an empirical approach that relies on the NEFSC survey time series. The F_{MSY} proxy is defined as the average CV of the survey and the B_{MSY} proxy is defined as the 75th percentile of the time series for all species but barndoor skate. The barndoor skate B_{MSY} proxy is based on the average of the autumn survey biomass indices from a short period of time (1963-1966). The terminal year F is estimated as the percent change in the three-year moving average of the survey time series. The stocks are declared to be overfished when the three-year moving average of the NMFS trawl survey index (mean weight per tow) is less than one half of the 75th percentile of mean weight per tow of the reference survey series for that species ($B_{threshold}$). Overfishing status is determined if the three-year moving average of the survey biomass index for a skate species declines by more than a critical percentage from the previous year's moving average, then fishing mortality is assumed to be greater than F_{MSY} and overfishing is assumed to be occurring for that skate species.

The level of review suggested for the 2023 skate complex management track assessment was Level 3 and the work plan included several proposed updates and changes to the assessment. All fishery and survey data will be updated through 2022. The analyst will explore adding an additional data source (i.e., recreational data) to the catch time series. In the past, recreational data has been used in catch accounting but not in assessment and is estimated to comprise up to 5% of total catch. Work will be conducted to evaluate the methods for attributing commercial fishery landings and recreational catch of skates by species. Skates are difficult to identify by species, and use of dealer and observer data to characterize the catch by species has been hampered by known data errors. The analyst will explore opportunities to improve the utility of the dealer and observer data streams for allocation to species. For skates that have been managed with a possession prohibition, the analyst will examine the use of fishery compliance assumptions to reduce the landings attributed to these skates and increase landings attributed to other species. The analyst plans to explore the utility of other surveys to inform the skate complex assessment. This will include exploration of the fall NEFSC bottom trawl survey as an additional index for little skate and spring survey for others, MA-DMF spring and fall surveys as additional indices for winter, little, thorny and barndoor skates, the ASMFC shrimp survey as an additional index for thorny and smooth skate, and the NEFSC bottom longline survey as an index for thorny and barndoor skates. The analyst plans to examine the potential difference between landings and discards produced through AA tables and CAMS methods.

The NEFSC bottom trawl surveys were not completed in 2020 due to the pandemic. The analyst will explore whether to treat missing 2020 survey data as missing or to impute a value for 2020. The analyst also noted that they will explore the utility of 2020 survey data from the southern region, which did get some coverage before the survey stopped. The analyst will calculate the ABC based on decisions made on survey time series and approach to dealing with missing 2020 data. The backup assessment for the skate complex is LOESS smoothing of both NEFSC surveys indices to infer future catch change (Ismooth).

This management track assessment will involve substantial changes, including the potential addition of new survey indices. **The AOP agreed with the analyst's suggestion of a Level 3 – Enhanced Review for this stock.**

Red Hake - North and South (AOP Lead: Paul Rago)
Recommendation: Level 2 (Expedited Review)

Northern and Southern Red Hake stocks were last updated using an empirical approach in a Level 3 Management Track Assessment (September 2020). Prior to this update, the stocks were evaluated using the AIM approach which relates a measure of population growth rate to the exploitation rate of the stock. The AIM model is rejected when the expected linear relationship is statistically insignificant. Low rates of exploitation and/or imprecise survey estimates can lead to this outcome. In 2020, rejection of AIM led to an alternative model in which actual biomass and exploitation are approximated using experimentally derived estimates of gear efficiency.

Both assessments are based on the same empirical approach wherein annual exploitation is computed as the ratio of total catch divided by an improved estimate of total stock biomass. Total stock biomass is based on the minimum swept-area estimate of biomass from the fall bottom trawl survey in year t and the spring bottom trawl survey in year t+1. The average biomass is improved by dividing it by an estimate of catchability experimentally derived from a comparison of standard research fishing gear with a chain sweep (Miller et al. 2020). The true biomass of the population is expected to be higher because the capture efficiency of the chain-sweep trawl is less than one.

The revised empirical model does not provide biological reference points but does rely on an external decision about the relevant period during which the stock appears to have responded to management measures followed by a period of stability. For Northern Red Hake the period of stability was defined as 1981-1994; for Southern Red Hake, the comparable period was 2001-2019. The mean exploitation rate during these intervals is multiplied by the most recent three-year average of biomass to estimate overfishing limits (or ABCs?). The previous AOP report in 2020 noted that the selection of the exploitation period is "not trivial" and "that there was no clear recommendation from the [RTA] reviewers as to the preferred model, but the approach being used seems to follow the advice of the reviewers by and large."

Estimated exploitation rates were low in both stocks (<1% North, <3% South) in 2019. Despite low catches and low exploitation rates on both stocks since about 2004, the Northern stock has increased markedly in both the spring and fall surveys. In contrast, the Southern red hake stock has remained at relatively low levels. Causes for the lack of response in the Southern stock are

unknown. Climatic effects may be occurring but there is limited evidence of migration or changes in geographic centers of gravity. Moreover, coherence between spring and fall abundance indices remains high in both areas.

Comparisons of landings and discard data under the new CAMS approach with previous estimates using the AA method are ongoing. In view of the low overall rates of exploitation, the transition to CAMS is unlikely to have a major impact on exploitation estimates. A potentially greater effect is the inclusion of recreational catch data from MRIP. These estimates are highly imprecise at the annual level. Decomposition of these data into finer stock areas will increase their uncertainty.

The AOP's recommendation of a Level 2 Management Track Assessment in September 2023 is based on the potential cumulative effect of several ostensibly minor factors. The AOP expressed concerns about treatment of missing survey data in both spring and fall of 2020. Methods that have been used to impute biomass for missing data for other stocks will need to be applied and evaluated for both red hake stocks. The offset of average survey estimates across calendar years and the overall coherence of spring and fall survey data for both stocks should reduce the effects of missing data in 2020. The use of CAMS estimates for commercial catch and MRIP for recreational catch is expected to have a minor impact. Discussions of the differing responses of the stocks to historical exploitation rates should be useful, particularly if such discussions lead to more refined analyses of underlying causes.

Acadian Redfish (AOP Lead: Gary Nelson)
Recommendation: Level 3 (Enhanced Review)

The current assessment methodology for the Acadian Redfish stock is a statistical catch-at-age model (ASAP) in which estimates of recruitment, fishing mortality and abundance are made by using commercial landings (plus discards), NEFSC spring and survey indices, and age information. The current configuration uses an M of 0.05, assumes one fishery fleet, and uses a single fishery selectivity block. The stock was last assessed in 2020 and the status stock determination, after retrospective adjustment of the terminal F and spawning stock biomass, was that overfishing was not occurring and the stock was not overfished.

The proposed plan for the 2023 management track assessment is to update several sources of information. All NEFSC survey indices will be updated and changed to the new tow-specific swept-area measures (the 2020 index will be treated as missing). US commercial landings and discards for 2020-2022 will be updated by using the CAMS approach. Little impact is expected on the landings, but there will be some impact on the discards estimates. Age data will be updated to include current and historical, previously unavailable data. In addition, two primary changes to the current model structure will be made; these include splitting the Albatross-Bigelow spring and fall surveys and readjustment of fishery and survey weights. If deemed necessary, the terminal F and spawning stock biomass will be adjusted for retrospective bias. New reference points will be calculated and projections for 2024-2026 will be made using the same approaches developed in the 2020 assessment. The lead analyst will also explore possible changes in fishery selectivity and growth over time.

Due to the potential for significant impact of the proposed changes on the assessment results, the lead analyst recommended a Level 3 Management Track Assessment; the AOP unanimously concurred.

Windowpane Flounder - Northern (AOP Lead: Lisa Kerr)
Recommendation: Level 2 (Expedited Review)

Northern windowpane flounder was last assessed during the September 2020 management track assessment. At that time, the AIM model was rejected for use due to the lack of significance in the relationship between population response and fishing mortality. Northern windowpane is currently assessed using an empirical approach that uses catch/swept area biomass (expanded from fall NEFSC survey) to estimate annual exploitation rate. There were no reference points derived from the estimates of relative exploitation rate. For catch advice setting, several scenarios were considered where the mean relative exploitation rate during a period could be applied to the current biomass estimate for a catch recommendation. It was decided to apply the mean exploitation rate during the period of 2010-2019, the time period when the "no possession" rule was in place, to the final biomass estimate to derive catch. Northern windowpane stock status is overfished as determined by NMFS and the overfishing status is unknown. The back-up assessment plan for this stock is LOESS smoothing of survey index time series to determine slope of trend and adjust catch accordingly (Ismooth).

The analyst suggested a Level 1 review for this stock for the 2023 management track assessment. The analyst proposed to use the same swept-area biomass method with updated Bigelow net efficiency conversion factors for northern windowpane, survey indices, catch and discards through 2022. While there are no proposed changes to the model, two data streams (i.e., NEFSC Trawl Survey and the discarded catch) have changes in how they are calculated, and Covid-19 disruptions resulted in missing surveys and reduced observer and port sampling of catch data in 2020. The NEFSC has adopted swept area biomass calculations of indices and the impact of the adjustment to the NEFSC trawl survey data was reported to be minimal for northern windowpane. Discards from 2019-2022 will be estimated using the CAMS method and the difference between AA tables and CAMs estimates should be examined for this stock (i.e., 2019 comparison between AA and CAMs method). The analyst proposed to impute a value for the 2020 missing trawl survey using a mean of 2019 and 2021 survey indices will be used to replace the missing 2020 survey value.

The AOP suggested that a Level 2 review be conducted for this stock. A Level 2 is required when: 1) evaluating effects of delayed seasonal surveys or missing strata on fishery independent measures of abundance if significant analysis is required to characterize the effects, and 2) recalibrated catch estimates (e.g., CAMs). Furthermore, the AOP suggested additional analyses be pursued in this management track assessment. The analyst was asked to evaluate any potential sources of incidental mortality or additional removals from the population that could be characterized to improve the assessment (e.g., overages in limits in scallop fishery). Furthermore, the analyst was asked to examine whether there are any trends in catch rates as estimated in the D/K indices over time that may provide additional information on the trend in relative abundance for this stock. The analyst was also asked to look at a recent publication on survey efficiency to evaluate whether this information should be used to adjust survey-based biomass estimates for this stock (Miller et al. 2023). Finally, any further insight from the analyst on the appropriate

time period to use in deriving mean exploration rate as an Fmsy proxy or comment on the prior time series used would be helpful in catch advice setting.

This stock is of particular concern as northern windowpane is overfished and in a rebuilding plan. Although northern windowpane is a no possession species, it is caught as bycatch in the groundfish and scallop fisheries and accountability measures are in place. It was noted that there have been overages in catch in the scallop fishery in recent years and accountability measures for scallop fishery triggered the past two years.

Windowpane Flounder - Southern (AOP Lead: Lisa Kerr)
Recommendation: Level 1 (Direct Delivery)

Southern windowpane was last assessed in the September 2020 management track using AIM (An Index Model). Southern windowpane is not overfished and overfishing is not occurring. Reference points (Fmsy, Bmsy proxies) are estimated for this stock but short-term projections are not conducted.

The 2023 management track assessment for this stock will run the AIM model, adding fall bottom trawl survey indices, landings and discard estimates from 2020-2022. Similar to other assessments, this assessment will need to deal with missing 2020 survey data. The analyst proposed using the mean of the 2019 and 2021 fall bottom trawl survey indices as a replacement for the 2020 value. The discards from 2019 to 2022 will be estimated using the CAMS method. The analyst should confirm that there are minimal differences between AA tables and CAMS methods of estimation. The alternative assessment plan is an empirical approach where relative exploitation rates for the time series are calculated using catch/swept-area biomass. In this case, an Fmsy proxy can be derived using the mean of the same series of years as the AIM model uses, or any other time series. Alternatively, LOESS smoothing of survey index time series to determine slope of trend and adjust catch accordingly (Ismooth) could be used.

The analyst suggested a Level 1 review for this stock for the 2023 management track assessment. There are no changes proposed to the assessment methods. The management track will focus on updating the assessment model with three years of new data. **The AOP agreed with the Level 1 review for this stock but noted that the level of review should be upgraded if any unexpected issues arise or there is a change in stock status.**

Silver Hake - North (AOP Lead: Gary Nelson)
Recommendation: Level 1 (Direct Delivery)

The current assessment methodology for the Northern Silver Hake stock is an empirical approach in which annual exploitation rates are developed from a 3-year moving–average of the NEFSC autumn survey index and catch. Reference points, overfishing and biomass thresholds, are available and are based on a reviewed approach from the 2010 benchmark assessment. The assessment was last updated in 2020. The 2020 stock status determination was that the Northern stock was not overfished and overfishing was not occurring.

The proposed plan for the 2023 management track assessment is to update US commercial landings and discards through 2022 using the CAMS approach instead of AA methodology; little

impact is expected with the switch to the CAMS approach. In addition, the NEFSC autumn trawl survey indices will be updated through 2022. The 2020 fall survey was not conducted due to COVID restrictions; therefore, the 2020 survey index value will be treated as missing and only a two-year moving average will be used to calculate relative exploitation rates where applicable. All biological reference points will remain the same. Projections will not be performed due to the limitations of the empirical approach.

The AOP concurred unanimously with the lead assessment scientist's determination that the update plan reflects a Level 1 Management Track Assessment. However, the AOP members did express concern that the reference points may be outdated and should be re-examined in the future.

Silver Hake/Offshore Hake - South (AOP Lead: Gary Nelson)
Recommendation: Level 1 (Direct Delivery)

The current assessment methodology for the Southern Silver Hake stock is an empirical approach in which annual exploitation rates are developed from a 3-year moving–average of the NEFSC autumn survey index and catch. Reference points, overfishing and biomass thresholds, are available and are based on a reviewed approach from the 2010 benchmark assessment. The assessment was last updated in 2020. The 2020 stock status determination was that the southern stock was not overfished and overfishing was not occurring.

The proposed plan for the 2023 management track assessment is to update US commercial landings and discards through 2022 using the CAMS approach instead of AA methodology; little impact is expected with the switch to the CAMS approach. The NEFSC autumn trawl survey indices will be updated through 2022 as well. The 2020 fall survey was not conducted due to COVID restrictions; therefore, the 2020 survey index value will be treated as missing and only a two-year moving average will be used to calculate relative exploitation rates where applicable. Because commercial landings of Silver Hake are mixed with landings of Offshore Hake, species composition data from the updated surveys will be used to partition landings into species contributions. All biological reference points will remain the same. Projections will not be performed due to the limitations of the empirical approach.

The AOP concurred unanimously with the lead assessment scientist's determination that the update plan reflects a Level 1 Management Track Assessment. However, as with the Northern Silver Hake stock, the AOP members did express concern that the reference points may be outdated and should be re-examined in the future.

AOP Meeting Conclusions:

The AOP met on May 22, 2023 to review the stock assessment plans for 8 stocks scheduled for the September 2023 Management Track cycle. The panel concluded that a Level 1 review (Direct Delivery) was warranted for northern and southern silver hake and southern windowpane flounder; Level 2 reviews (Expedited Review) for northern and southern red hake and northern windowpane flounder; and Level 3 review (Enhanced Review) for the skate complex and Acadian redfish. The Level 2 and 3 reviews will occur during the September 2023 Management Track Peer Review scheduled for September 18-22, 2023. Spiny dogfish will be reviewed at this

meeting, based on the recommendation from the NRCC. Changes in the required review level would be triggered by a Northeast Fisheries Science Center request to increase the review level for a given stock. The AOP could concur to increase the review level via email or request to reconvene the AOP panel to have further discussions with the stock assessment lead. In the case of southern windowpane flounder, if there is a status change, the AOP agreed to raise the review level to Level 2 (Expedited Review) via correspondence. Any need to reconvene the panel would be a publicly announced meeting and any subsequent changes to the review level would be publicized to assessment partners and stakeholders.

Appendix 1. Assessment Oversight Panel Meeting participants (names only, no call-in numbers).

Chris Legault, AOP Chair (NEFSC)
Paul Rago, AOP (MAFMC)
Gary Nelson, AOP (ASMFC)
Lisa Kerr, AOP (NEFMC)
Michele Traver - NEFSC

Alex Dunn - NEFSC
Alex Hansell - NEFSC
Andrew Applegate - NEFMC Staff
Andrew Jones - NEFSC
Angela Forristall - NEFMC Staff
Ben Levy - NEFSC
Brian Linton - NEFSC
Charles Adams - NEFSC
Connor Buckley - NEFMC Staff
Dave McCarron - NEMFC Staff
Emily Bodell - NEFMC Staff
Jacqueline O'Dell - Northeast Fisheries Coalition
Jamie Cournane - NEFMC Staff
Jason Boucher - NEFSC
Jon Deroba - NEFSC
Julie Nieland - NEFSC
Kathy Sosebee - NEFSC
Kelly Whitmore - MA DMF
Kristan Blackhart - NEFSC
Leona Burgess - NEFSC
Libby Etrie - NEFMC Member
Mark Alexander - NEFMC Member
Melanie Griffin - MA DMF
Paul Nitschke - NEFSC
Rachel Feeney - NEFMC Staff
Robin Frede - NEFMC Staff
Sefatia Romeo Theken - Deputy Commissioner for MA Fisheries and Game
Scott Olszewski - NEFMC Member
Shannah Jaburek - GARFO
Susan Wigley - NEFSC
Tim Miller - NEFSC
Toni Chute - NEFSC
Tony Wood - NEFSC

Key:
ASMFC - Atlantic States Marine Fisheries Council
GARFO - Greater Atlantic Regional Fisheries Office

MADMF - Massachusetts Division of Marine Fisheries
MAFMC - Mid-Atlantic Fisheries Management Council
NEFMC - New England Fisheries Management Council
NEFSC - Northeast Fisheries Science Center

Appendix B. Management Track Stock Assessment Terms of Reference

1. Estimate catch from all sources including landings and discards.

2. Evaluate indices used in the assessment (e.g., indices of relative or absolute abundance, recruitment, state surveys, age-length data, etc.).

3. Estimate annual fishing mortality, recruitment and stock biomass (both total and spawning stock) as possible (depending on the assessment method) for the time series using the approved assessment method and estimate their uncertainty. Include retrospective analyses if possible (both historical and within-model) to allow a comparison with previous assessment results and projections, and to examine model fit.
    a. Include bridge runs to sequentially document each change from the previously accepted model to the updated model proposed for this peer review.
    b. Prepare a backup assessment approach that would serve as an alternative for providing scientific advice to management if the analytical assessment were to not pass review

4. Re-estimate or update the BRP's as defined by the management track level and recommend stock status. Also, provide qualitative descriptions of stock status based on simple indicators/metrics (e.g., age- and size-structure, temporal trends in population size or recruitment indices, etc.).

5. Conduct short-term stock projections when appropriate.

6. Respond to any review panel comments or SSC concerns from the most recent prior research or management track assessment.

* Major changes from the previous stock assessment require pre-approval by the Assessment Oversight Panel.

Appendix C. September 2023 Management Track Peer Review meeting attendees.

GARFO - Greater Atlantic Regional Fisheries Office
MA DMF - Massachusetts Division of Marine Fisheries
MAFMC - Mid-Atlantic Fisheries Management Council
NEFMC - New England Fisheries Management Council
NEFSC - Northeast Fisheries Science Center
NC DMF - North Carolina Division of Marine Fisheries
RI DEM - Rhode Island Department of Environmental Management
SMAST - University of Massachusetts School of Marine Science and Technology
UMASS - University of Massachusetts

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Adrian Jordaan - Chair
Yong Chen - Panel
Tom Miller - Panel

Russ Brown - NEFSC
Michele Traver - NEFSC

Alan Bianchi - North Carolina DMF
Alex Dunn - NEFSC
Alex Hansell - NEFSC
Amanda Hart - NEFSC
Andrew Minkiewicz - Kelley Drye & Warren LLP
Andy Applegate - NEFMC Staff
Andy Jones - NEFSC
Angela Forristall - NEFMC Staff
Brian Linton - NEFSC
Cami McCandless - NEFSC
Cate O'Keefe - NEFMC Executive Director
Charles Adams - NEFSC
Charles Perretti - NEFSC
Chris Legault - NEFSC
Connor Buckley - NEFMC Staff
Conor Mcmanus - RI DEM
Cynthia Ferrio - GARFO
Dave McElroy - NEFSC
David McCarron - NEFMC Staff
Dvora Hart - NEFSC
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Emily Bodell - NEFMC Staff
Greg Ardini - NEFSC
Greg DiDomenico - Lund's Fisheries
Jacqueline ODell - Northeast Seafood Coalition
James Fletcher - United Commercial Fishermen's Association/industry
Jason Boucher - NEFSC
Jason Didden - MAFMC
Jeff Kaelin - Lund's Fisheries
Jeff Kneebone - MA DMF
Jessica Blaylock - NEFSC
John Whiteside - Whiteside Law
Jon Deroba - NEFSC
Jui-Han Chang - NEFSC
Julie Nieland - NEFSC
Kathy Sosebee - NEFSC
Kelly Whitmore - MA DMF
Kiersten Curti - NEFSC
Larry Alade - NEFSC
Libby Etrie - NEFMC member
Lindsey Nelson - NEFSC
Liz Sullivan - GARFO
Louis Forristall - GARFO
Mark Grant - GARFO
Mark Alexander - NEFMC member
Mark Terceiro - NEFSC
Melanie Griffin - MA DMF
Michelle Passerotti - NEFSC
Nichola Meserve - MA DMF
Paul Nitschke - NEFSC
Rachel Feeney - NEFMC Staff
Robin Frede - NEFMC Staff
Scott Olszewski - RI DEM
Sefatia Romeo Theken - Deputy Commissioner for MA Fisheries and Game
Steve Cadrin - SMAST
Susan Wigley - NEFSC
Tara Trinko Lake - NEFSC
Tobey Curtis - NOAA Office of Sustainable Fisheries
Toni Chute - NEFSC

Appendix D. Realized Agenda for September 2023 Management Track peer review.

September Management Track Peer Review Meeting
September 18-20, 2023

Google Meet joining info: https://meet.google.com/qza-zvku-oig
Or dial: (US) +1 252-987-4102 PIN: 732 891 507#

AGENDA (v. 9/15/2023)

**All times are approximate, and may be changed at the discretion of the Peer Review Panel chair. The meeting is open to the public; however, during the Report Writing sessions we ask that the public refrain from engaging in discussion with the Peer Review Panel.*

Monday, September 18, 2023

Time	Subject	Presenter
9:00 a.m. - 9:15 a.m.	Welcome/Logistics/Conduct of Meeting	Michele Traver, Russ Brown, Adrian Jordaan, Chair
9:15 a.m. - 10:15 a.m.	Red Hake (North and South) Discussion/Questions	Toni Chute Panel
10:15 a.m. - 10:30 a.m.	Break	
10:30 a.m. - 11:30 a.m.	Red Hake (North and South) cont. Discussion/Questions	Toni Chute Panel
11:30 a.m. - 11:45 a.m.	Morning Wrap Up Summary/Discussion	Panel
11:45 a.m. - 12:00 p.m.	Public Comment	Public
12:00 p.m. - 1:00 p.m.	Lunch	
1:00 p.m. - 2:00 p.m.	Acadian Redfish Discussion/Questions	Brian Linton Panel
2:00 p.m. - 3:00 p.m.	Break	
3:00 p.m. - 4:30 p.m.	Acadian Redfish cont. Discussion/Questions	Brian Linton Panel
4:30 p.m. - 4:45 p.m.	Afternoon Wrap Up Summary/Discussion	Panel

Time	Subject	Presenter
4:45 p.m. - 5:00 p.m.	Public Comment	Public
5:00 p.m.	Adjourn	

Tuesday, September 19, 2023

Time	Subject	Presenter
9:00 a.m. - 9:05 a.m.	Welcome/Logistics	Michele Traver Adrian Jordaan, Chair
9:05 a.m. - 10:30 a.m.	Skate Complex Discussion/Questions	Kathy Sosebee Panel
10:30 a.m. - 10:45 a.m.	Break	
10:45 a.m. - 12:00 p.m.	Skate Complex cont. Discussion/Questions	Kathy Sosebee Panel
12:00 p.m. - 12:15 p.m.	Morning Wrap Up Summary/Discussion	Panel
12:15 p.m. - 12:30 p.m.	Public Comment	Public
12:30 p.m. - 1:30 p.m.	Lunch	
1:30 p.m. - 3:30 p.m.	Atlantic Mackerel Discussion/Questions	Kiersten Curti Panel
3:30 p.m. - 3:45 p.m.	Break	
3:45 p.m. - 5:00 p.m.	Northern Windowpane Flounder Discussion/Questions	Toni Chute Panel
5:00 p.m. - 5:15 p.m.	Afternoon Wrap Up Summary/Discussion	Panel
5:15 p.m. - 5:30 p.m.	Public Comment	Public
5:30 p.m.	Adjourn	

Wednesday, September 20, 2023

Time	Subject	Presenter
9:00 a.m. - 9:05 a.m.	Welcome/Logistics	Michele Traver

Time	**Subject**	**Presenter**
		Adrian Jordaan, Chair
9:05 a.m. - 12:00 p.m.	Spiny Dogfish Discussion/Questions	Dvora Hart Panel
12:00 p.m. - 12:15 p.m.	Morning Wrap Up Summary/Discussion	Panel
12:15 p.m. - 12:30 p.m.	Public Comment	Public
12:30 p.m. - 1:30 p.m.	Lunch	
1:30 p.m. - 4:30 p.m.	Report Writing	Panel
4:30 p.m.	Adjourn	

Appendix E. 2008 SSC Memo.

draft working paper for peer review only

Atlantic Spiny Dogfish

2023 Management Track Assessment Report

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Fisheries Science Center
Woods Hole, Massachusetts

Compiled 09-05-2023

This assessment of the Atlantic Spiny Dogfish (Squalus acanthias) stock is an update of the research track assessment completed in 2022, which used 2019 as the terminal year. This assessment updates commercial and recreational fishery catch data, research survey indices of abundance, and the analytical assessment models through 2022. Additionally, the initial year for this assessment is 1924 compared to 1989 for the research track assessment, and stock projections have been updated through 2026

State of Stock: Based on this updated assessment, the Atlantic Spiny Dogfish (*Squalus acanthias*) stock is not overfished and overfishing is not occurring (Figures 1-2). Retrospective adjustments were not made to the model results. Spawning Output in 2022 was estimated to be 190.8 (million pups) which is 101% of its target (SSB_{MSY} *proxy* = 188; Figure 1). The 2022 fully selected fishing mortality was estimated to be 0.02 which is 81% of the overfishing threshold proxy (F_{MSY} *proxy* = 0.0246; Figure 2).

Table 1: Catch and status table for Atlantic Spiny Dogfish. All weights are in (mt) recruitment is in (million pups) and F_{Full} is the fishing mortality on fully selected ages. Model results are from the current SS3 model with lambda=6.

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
					Data					
Commercial landings	7,373	10,734	8,687	12,158	8,789	6,923	7,947	8,828	4,780	4,969
Recreational landings	219	120	67	205	141	51	56	101	215	19
Commercial discards	10,226	10,368	6,803	7,078	6,609	5,402	6,964	7,422	5,955	3,884
Recreational discards	5,685	13,327	2,698	4,277	2,032	2,038	3,798	1,815	3,524	1,965
Catch for Assessment	13,222	18,242	12,350	16,289	12,403	9,854	12,059	12,683	8,490	7,122
					Model Results					
Spawning Output	311.4	283.3	253.8	233.5	212.6	200	193.6	188.9	186.6	190.8
F_{Full}	0.03	0.046	0.033	0.044	0.038	0.031	0.042	0.042	0.027	0.02
Recruits	81.8	230.7	70.4	99.5	104.1	78.3	193.5	189.3	186.6	136.2

Table 2: Comparison of reference points estimated in the research track assessment and from the current assessment update. A 60% SPR proxy was used for the overfishing threshold.

	2019	2023
F_{MSY} *proxy*	0.025	0.025
SSB_{MSY} (million pups)	371	188 (148- 227)
MSY (mt)	N/C	7134 (5631 - 8636)
Recruits (million pups)	N/C	109.9
Overfishing	Yes	No
Overfished	No	No

Projections: Short term projections of biomass were obtained using the SS3 forecast module.

Table 3: Short term projections of total fishery catch and spawning output for Atlantic Spiny Dogfish based on a harvest scenario of fishing at F_{MSY} *proxy* between 2024 and 2026. The catch in 2023, 7,751 (mt) is the 2023 ACL/ACT

Year	Catch (mt)	SSB (million pups)	F_{Full}
2023	7751	196.9 (167.6 - 226.3)	0.025

Year	Catch (mt)	SSB (million pups)	F_{Full}
2024	7818	202.8 (171.9 - 233.7)	0.025
2025	7956	208.3 (177 - 239.6)	0.025
2026	8085	212.5 (180.9 - 244)	0.025

Special Comments:

- What are the most important sources of uncertainty in this stock assessment? Explain, and describe qualitatively how they affect the assessment results (such as estimates of biomass, F, recruitment, and population projections).

  The lack of age and growth data induces considerable uncertainty, particularly when there is evidence that the growth parameters have changed over time. Spiny dogfish discards are uncertain, and are highly uncertain for the period before observer data was available as well as during the first years with observer data due to low sample sizes. Additionally, there is uncertainty in the assumed discard mortality rates. Results also depend on the value of weighting of the survey index (lambda), which also causes substantial uncertainty.

- Does this assessment model have a retrospective pattern? If so, is the pattern minor, or major? (A major retrospective pattern occurs when the adjusted SSB or F_{Full} lies outside of the approximate joint confidence region for SSB and F_{Full}).

  This assessment had only a minor retrospective pattern. No retrospective adjustment of spawning output or fishing mortality in 2022 was required.

- Based on this stock assessment, are population projections well determined or uncertain? If this stock is in a rebuilding plan, how do the projections compare to the rebuilding schedule?

  Population projections for Atlantic Spiny Dogfish, are reasonably well determined particularly because of the longevity and slow growth of this stock. This stock is not in a rebuilding plan.

- Describe any changes that were made to the current stock assessment, beyond incorporating additional years of data and the effect these changes had on the assessment and stock status.

  The data weighting for the survey index was increased to lambda = 6. This both induced a better fit to the survey data and also allowed the model to match the Albatross/Bigelow calibration at large sizes.

- If the stock status has changed a lot since the previous assessment, explain why this occurred.

  The overfishing status of Atlantic Spiny Dogfish changed because of reduced catches in 2022 compared to the previous terminal year of 2019. This caused F to be below the overfishing threshold in 2022. Overfishing was occuring in 2019 in both the previous and current models.

- Provide qualitative statements describing the condition of the stock that relate to stock status.

  Female Atlantic Spiny Dogfish have a truncated size structure, with large females being a much smaller percentage of the population than was observed historically. Although overfishing was not occurring in 2022, it was occurring during every year from 2012-2021. Because the ACL/ACT for 2023 was above the SS3 estimated OFL for that year, and projected discards are likely underestimated, it is probable that overfishing is occurring in 2023 as well.

- Indicate what data or studies are currently lacking and which would be needed most to improve this stock assessment in the future.

  The Atlantic Spiny Dogfish assessment could be improved with age and growth data, as well as more studies regarding discard mortality.

- Are there other important issues?

References:

Chang, J-H., Sosebee, K., Hart, D.R. 2023. Stock Synthesis For Atlantic Spiny Dogfish. Appendix to this report.

Spiny Dogfish Research Track Working Group. Research Track Assessment of Northwest Atlantic Spiny Dogfish. NEFSC Center Reference Document, in press.

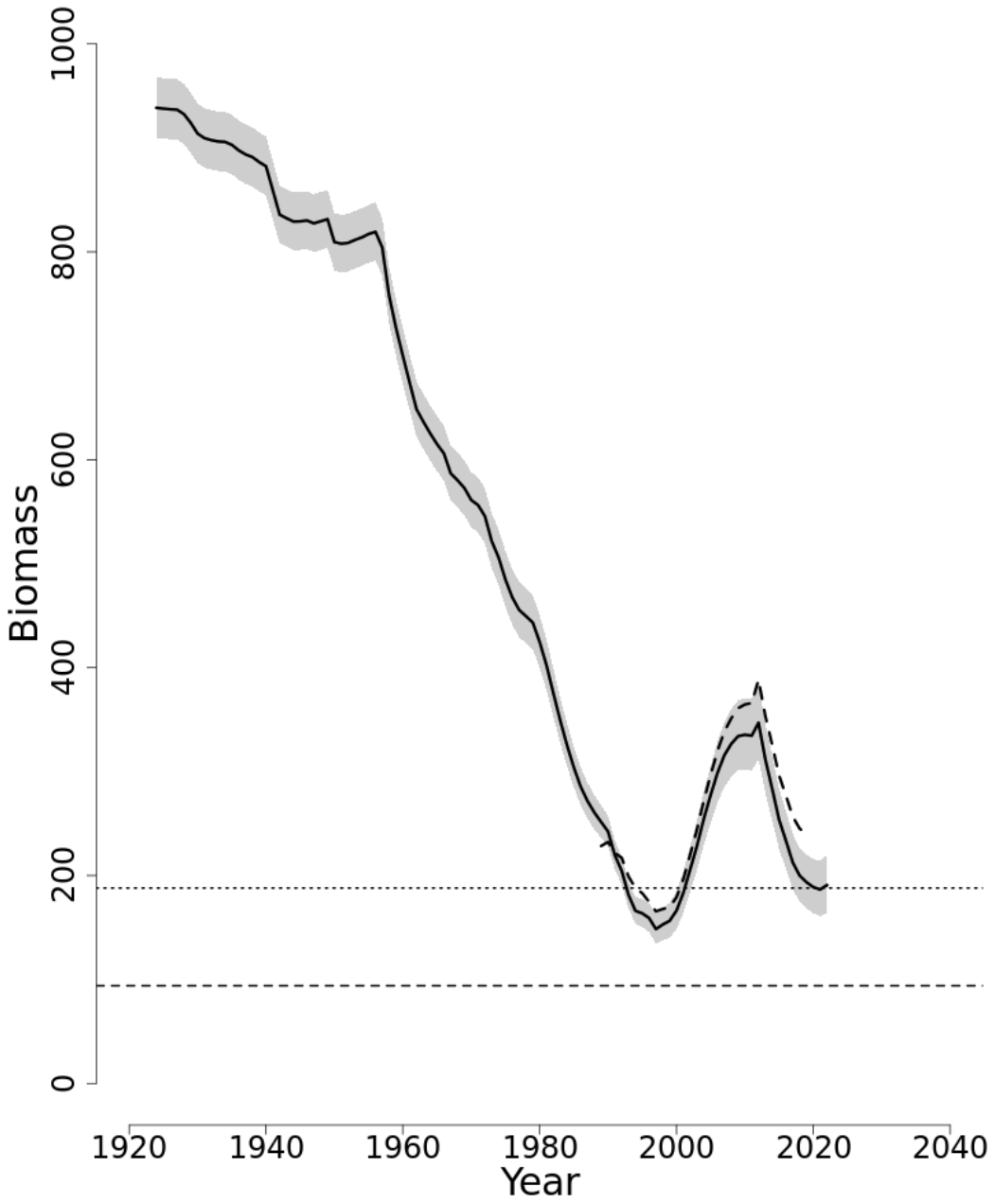

Figure 1: Trends in spawning output of Atlantic Spiny Dogfish between 1924 and 2022 from the current (solid line) and previous (dashed line) assessment and the corresponding $SSB_{Threshold}$ ($\frac{1}{2}$ SSB_{MSY} *proxy*; horizontal dashed line) as well as SSB_{Target} (SSB_{MSY} *proxy*; horizontal dotted line) based on the 2023 assessment. The approximate 95% gamma confidence intervals are shown.

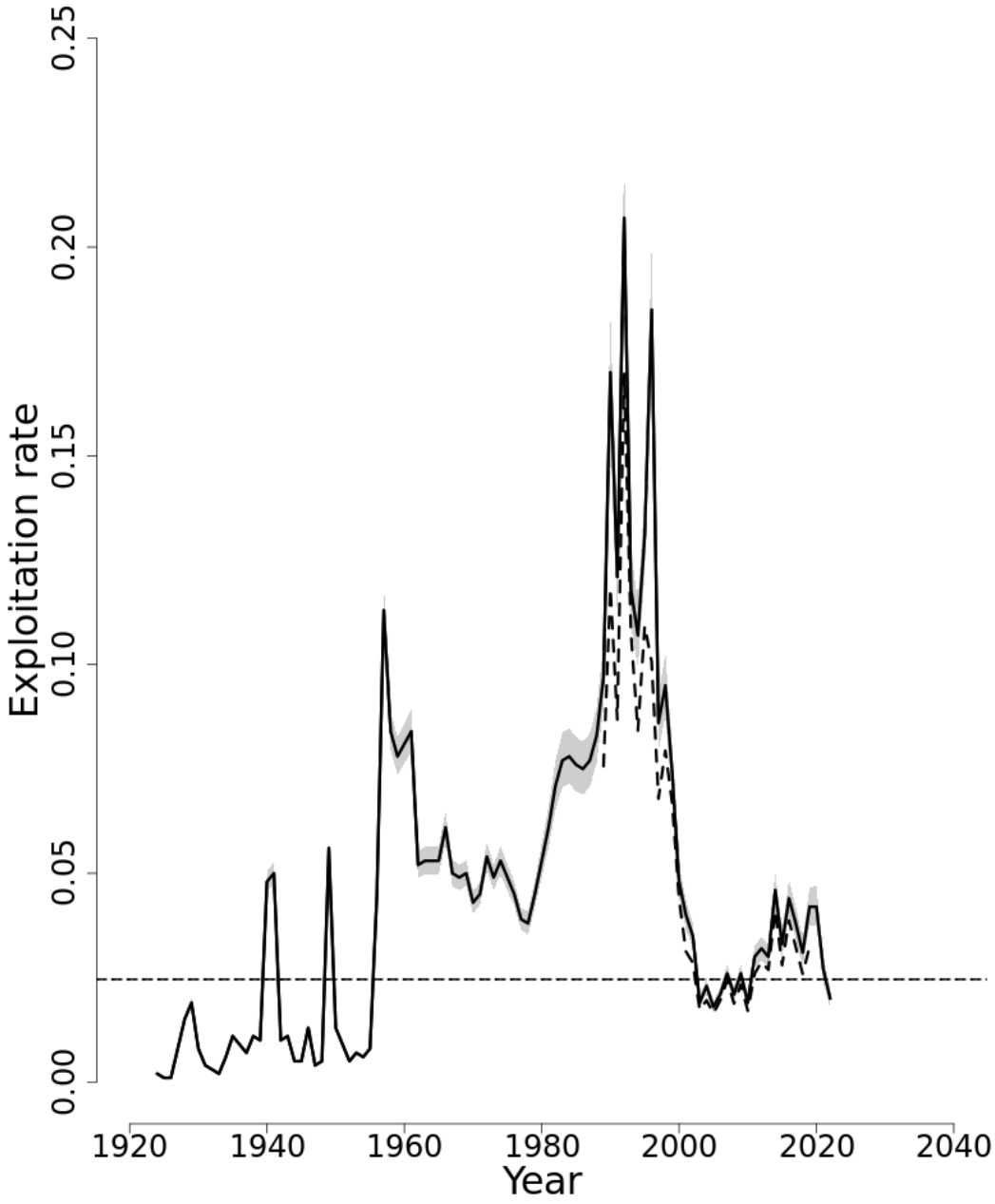

Figure 2: Trends in the fully selected fishing mortality (F_{Full}) of Atlantic Spiny Dogfish between 1924 and 2022 from the current (solid line) and previous (dashed line) assessment and the corresponding $F_{Threshold}$ (F_{MSY} *proxy*=0.0246; horizontal dashed line). based on the 2023 assessment. The approximate 95% gamma confidence intervals are shown.

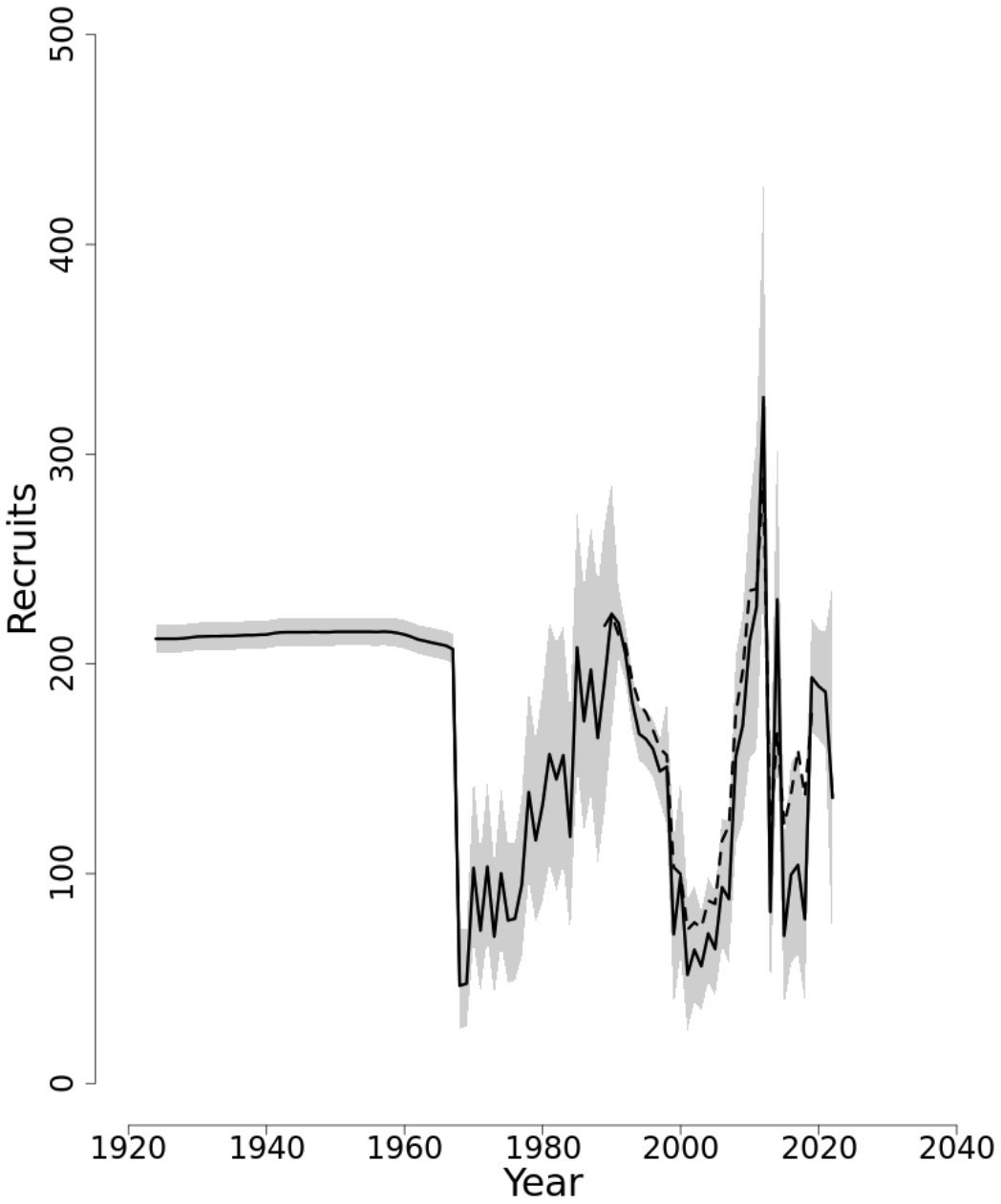

Figure 3: Trends in Recruits (million pups) of Atlantic Spiny Dogfish between 1924 and 2022 from the current (solid line) and previous (dashed line) assessment. The approximate 95% gamma confidence intervals are shown.

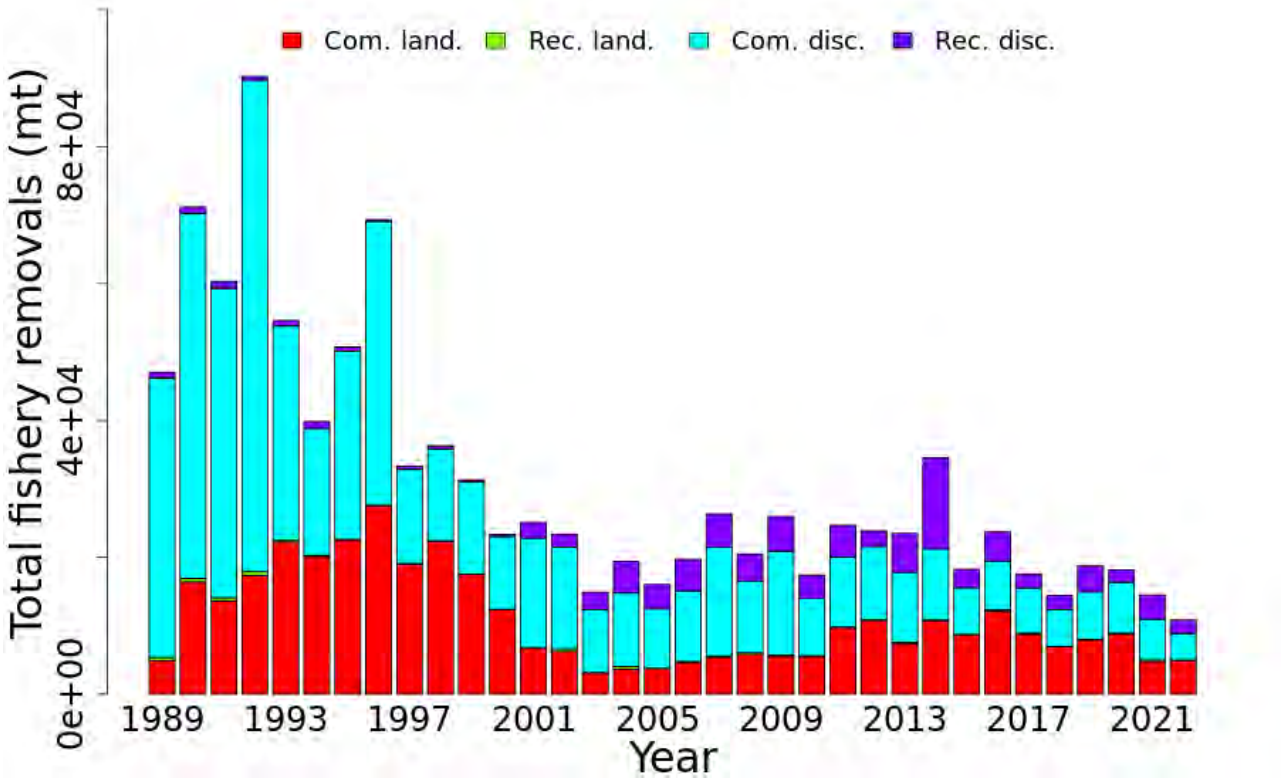

Figure 4: Total catch of Atlantic Spiny Dogfish between 1989 and 2022 by fleet (commercial, recreational, or Canadian) and disposition (landings and discards).

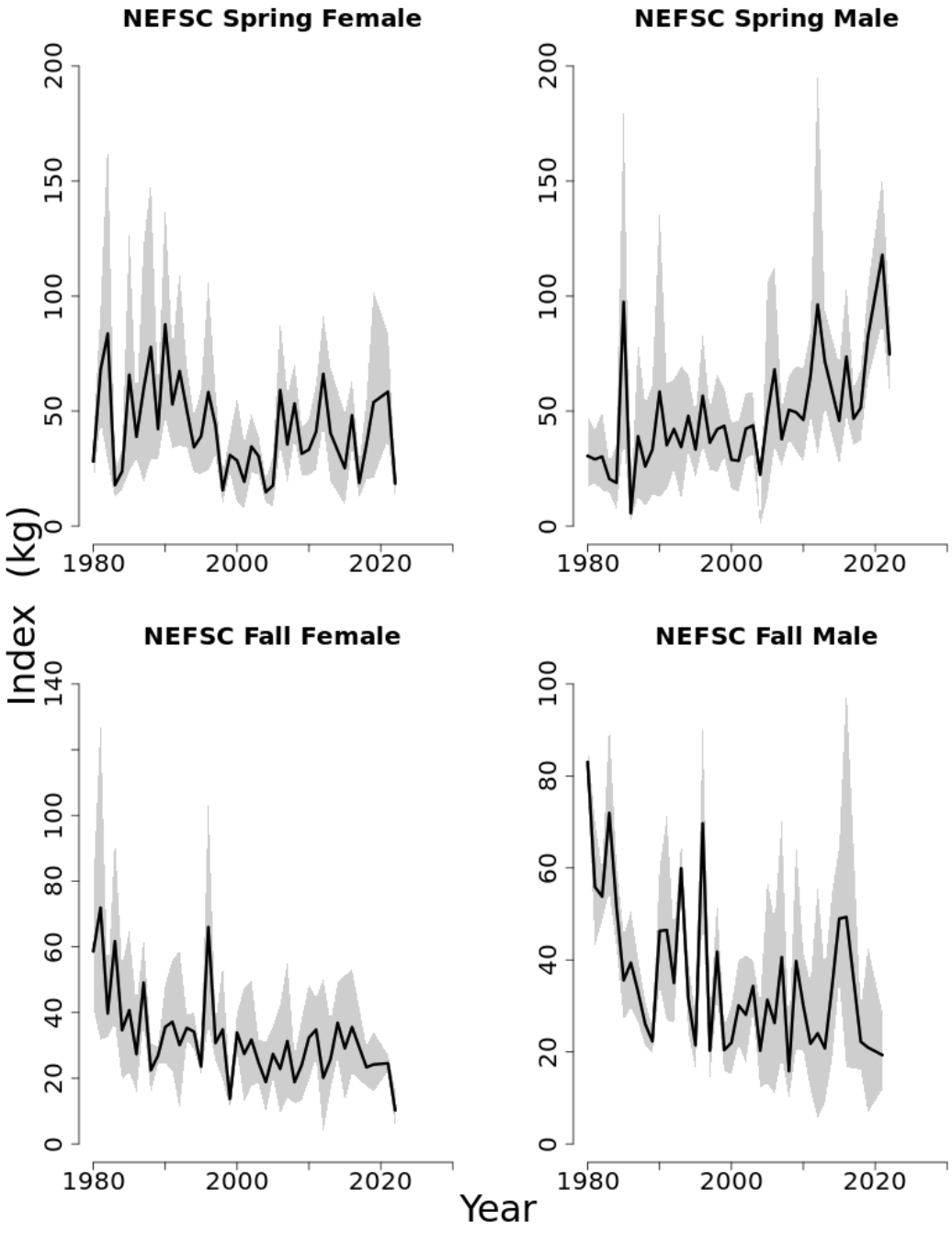

Figure 5: Indices of biomass for the Atlantic Spiny Dogfish between 1980 and 2022 for the Northeast Fisheries Science Center (NEFSC) spring and fall bottom trawl surveys; Females on the left, males on the right. The approximate 95% gamma confidence intervals are shown.

Stock Synthesis For Atlantic Spiny Dogfish

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September 2, 2023

Contents

1 Introduction

A sex-specific stock assessment model was constructed and implemented in Stock Synthesis version 3.30.21 (SS3; Methot and Wetzel 2013) for the 2023 Atlantic spiny dogfish management track assessment. This is an update of the SS3 model used during the 2022 spiny dogfish research track that is documented in NEFSC (2022). Updates on model configurations for this assessment are listed and discussed below:

- Model starting/ending year,
- Catch and survey data,
- Time blocks for biology, survey, and fishery
- Priors for selectivity parameters
- Likelihood weights for survey indices, and
- Spawner-recruitment relationship parameters.

2 Model Configuration

2.1 Model Starting/Ending Year

For the 2022 research track assessment, the SS3 model runs started in 1989, the first year quantitative discards information was available from the observer data. For this assessment, the model runs started in 1924, assuming the population was unfished before 1924. Despite the uncertainties in earlier years' catch, starting the model around the onset of the fishery is a more realistic model configuration than starting the model in 1989 with the assumption that the catch level was maintained at an initial equilibrium catch annually for 100+ years (R. Methot, NOAA Fisheries, personal communication). The terminal year for the SS3 runs is 2022 for the 2023 management track assessment. An SS3 run starting from 1989 using the 2022 research track assessment model was conducted in the sensitivity analysis.

2.2 Catch and Survey Data

Commercial catch time series data by gear were obtained from two sources: the research document from Fowler and Campana (2015) for landings from 1924 to 1961 (which was in turn based on Jensen et al. 1961) and discards from 1924 to 1988, and the Northeast Fisheries Science Center (NEFSC) database for later years. Sex-specific length composition data for catch by gear were obtained from the NEFSC database, and are available for landings from 1982 to 2022 and discards from 1989 to 2022. Like the 2022 research track assessment, the commercial data by gear were aggregated into five modeling fleets (two landings fleets and three discard fleets; Table 1 and Figures 1-2).

NEFSC spring bottom trawl survey data were used as the abundance index for the SS3 modeling. The survey index and sex-specific length composition data used in the 2022

research track assessment (offshore strata: 1-30, 34, 36-40, 61-76; inshore strata: 2, 5, 8, 11, 14, 17, 20, 23, 26, 29, 32, 35, 38, 41, 44-46, 56, 59-61, 64-66) were extended to 1982-2022 (besides 2014 and 2020 when data was not available). Following the research track assessment, survey selectivity time blocks were implemented to estimate different selectivities for the two different research vessels conducting the survey: RV *Albatross IV* (1982-2008) and FRV *Henry B. Bigelow* (2009-2022).

Additional NEFSC spring bottom trawl survey data from 1968 to 1981, which only covered the offshore strata (1-30, 34, 36-40, 61-76), were included in this assessment. The offshore strata surveyed in 1968-1981 is around half of the area size of the inshore+offshore strata surveyed in 1982-2022. The additional survey data were separated into two time series and modeled as different "fleets" in SS3 based on changes in the survey gear: Yankee 36 trawl net was used in 1968-1972, and Yankee 41 trawl net was used in 1973-1981 (Table 1). Sex-specific length composition data were available for all years except for 1973-1979, where only the unsexed data were available.

2.3 Time Blocks for Biology, Survey, and Fishery

Consistent with the 2022 research track assessment, survey time blocks (mentioned above), as well as biology time blocks, were used for this assessment. The time series was split into two biology time blocks with different growth, fecundity, and maturity for the years prior to 2012, and for 2012 and afterward.

New time blocks of selectivity for the landings fleets were introduced for this assessment. The 2022 research track assessment model showed some systematic poor fit to the landings' length composition data for large females in 1989-1993 (NEFSC 2022). Preliminary model runs for this assessment showed that the systematic poor fit persisted and extended to 1982 due to the sharp drop in proportions of large females for the landings fleets during the 1990s (Figure 3). Similar but less clear reductions were also observed for large males (Figure 4). Therefore, a time block of 1994-2022 (referred to as fishery block) on the peak value selectivity parameter (first size at maximum selectivity) for both sexes was implemented for this assessment to account for the shift in the length compositions for the two landings fleets. A sensitivity run was conducted to examine the fishery block assumption.

2.4 Prior for Selectivity Parameters

For this assessment, instead of non-informative priors, double normal selectivity parameters for all fleets utilize a diffuse symmetric beta prior (standard deviation = 0.05, scaled between parameter bounds) to impose a larger penalty near the parameter bounds. The diffuse symmetric beta prior provided only weak information about the parameters and helped the correlated selectivity parameters to avoid crashing into the bounds (Methot et al. 2021).

2.5 Likelihood Weights for Survey Indices

Preliminary model runs showed that the survey indices were not fitting well, similar to the 2022 research track model results. In order to fit the survey indices better, different likelihood weights (λ) for the three survey indices were explored during this assessment. Increasing λ changed the scale of the population and the female sex ratio of the estimated population by changing the survey catchability q and apical survey selectivity for females relative to males. $\lambda = 6$ was selected for this assessment so that the apical survey selectivity for females for the *Albatross* period is the same as the *Bigelow* period. This is a reasonable assumption, considering the substantial calibration data between these two vessels, and that the survey domain of the two periods is similar. The comparisons of model results with different λ for the survey indices are in the sensitivity analysis section.

2.6 Spawner-Recruitment Relationship Parameters

The survivorship spawner-recruitment (SR) parameters were updated based on a profile analysis and fixed at $Z_{frac} = 0.8$, $\beta = 1$, and $\sigma_R = 0.6$ (standard deviation of log recruitment deviations) for the final model for this assessment. Figure 5 compared the SR relationships from this assessment to that of the 2022 research track assessment.

3 Model Results

3.1 Convergence

The base case model converged (gradient 9.7×10^{-5}), and the Hessian matrix was positive definite. All parameters were estimated within their bounds, correlations between parameters were low (< 0.95), and all parameters were informative (correlation > 0.01).

3.2 Overall Goodness of Fit

The overall model fit to the abundance index and length composition data was evaluated using joint-index residual plots from the fit to the index data and the mean length of the length composition data (Carvalho et al. 2021). The residual plot for the three NEFSC spring bottom trawl survey indices showed a mild positive residual pattern around the end of the time series, with RMSE = 39.4% (Figure 6). The residual plot for the mean length of length composition data showed a good fit with RMSE = 8.7%. The loess-smoother of this plot showed a negative residual pattern in the early time series but no apparent residual pattern for recent years (Figure 7). The above analyses indicates a reasonably good overall fit to the data.

3.3 Growth

The time-varying growth curve by sex are shown in Figure 8. The estimated L_∞ for the biology block 2012-2022 were 88.52 cm for females and 79.74 cm for males. These estimates are similar to the 2022 research track assessment (female: 89.24 cm; male: 79.14 cm) and smaller than the estimates from Nammack et al. (1985; female: 100.5 cm; male: 82.49 cm). The reduction is more significant for females than males, likely reflecting the decrease of large females and males in both catch and survey data after 1995 (Figures 3 and 4).

3.4 Abundance Index

The observed and model-predicted NEFSC spring bottom trawl abundance indices are shown in Figure 9. The estimated survey catchabilities (q) were 0.17, 0.47, and 0.87 for fleets 6 (1968-1972), 7 (1973-1981), and 8 (1982-2022), respectively.

3.5 Selectivity

The estimated selectivities by sex and fleet are shown in Figure 10. The estimated selectivities were asymptotic (logistic) for all landings fleets and NEFSC spring bottom trawl survey fleets (fleets 1, 2, 6-8) and dome-shaped for all discard fleets (3-5). The estimated apical male selectivity was smaller than females for landings and discard fleets (1-5), which is reasonable for a female-targeted fishery. The estimated apical male selectivity was smaller than females for the two offshore surveys but similar to females for the inshore+offshore survey.

Time-varying selectivities showed a reduced peak value selectivity parameter for females and males for the two landings fleets in 1994-2022 (Figures 11 and 12). The peak value was reduced by 12.5 cm for fleet 1 and 9.9 cm for fleet 2 for both sexes. NEFSC spring bottom trawl survey showed increased selectivities for the median-size females and males during the *Bigelow* period (2009-2022; Figure 13).

3.6 Length Composition

The observed and model-predicted length compositions aggregated across time by fleet and sex are shown in Figure 14. The fits to the aggregated length compositions appear to be reasonably accurate. The observed and model-predicted annual length composition data and the residuals from the fits by fleet and sex are in Figures 15-30. Fits to the annual length composition were poor for the median size males for fleet 8 (Figure 30).

3.7 Recruitment

The fixed survivorship SR relationship, along with the estimated age-0 recruitment from both the SR relationship and recruitment deviations, are shown in Figure 31. The estimated age-0 recruitment has decreased slightly since 2019 (Table 2 and Figure 32).

3.8 Total Biomass, Spawning Output, and Fishing Mortality

The estimated time series of spawning output, fishing mortality, and sex-specific total biomass are provided in Table 2 and Figures 33 and 34. The estimated total biomass indicated significant changes in the population structure: the female-dominated population shifted to male domination around the 1980s (Figure 33). Females' weights at age are greater and have longer lifespans than males (Nammack et al. 1985); therefore, the estimated biomasses were higher than males early in the time series. This changed in the 1980s due to increasing fishing pressure on larger females (Figure 3). The estimated spawning output, i.e., the number of pups the mature females produced, had been dropping since 2012 but leveled off in the most recent years (Figure 34). The terminal spawning output is 190,771 (1,000s). The estimated fishing mortality decreased slightly since 2020. The terminal fishing mortality is 0.02.

4 Sensitivity Analysis

4.1 1989-2022 Research Track Model

Sensitivity runs were conducted to compare different model configurations:

- 2023 management track model (1924-2022),
- 2022 research track model (1989-2019), and
- 2022 research track model (1989-2022).

The estimated spawning output and fishing mortality from the 2022 research track model (1989-2019) are the highest and lowest, respectively, among the three models tested (Figures 35 and 36). However, the estimated spawning output, fishing mortality, and recruitment from the 2022 research track model with additional three years of data (1989-2022) and from the 2023 management track model (1924-2022) are very similar (1924-2022; Figures 35-37).

4.2 Fishery Block

A sensitivity run was conducted without the fishery block assumption. The fishery block assumption has minor influence on the estimated spawner output, fishing mortality, and recruitment (Figures 38-40) but improved the fits to the length compositions for large females and males in years prior to 1994 for the two landings fleets (Figures 41 and 42).

4.3 Likelihood Weights

Ten SS3 runs with λ increased from 1 to 10 for all three surveys were conducted, and the results were compared. Fits to the survey indices improved slightly with increasing *lambda*

(Figure 43). The improvement is mainly contributed by reducing survey catchability q and changes in female apical selectivity for the NEFSC spring bottom trawl survey (fleet 8). The survey q was reduced from 0.97 at $\lambda = 1$ to 0.84 at $\lambda = 10$. As a result, the estimated total population and recruitment increased with increasing λ (Figures 44 and 45).

A female apical selectivity smaller than 1 means fewer females were caught than males, and vice versa for the female apical selectivity larger than 1. The female apical selectivity was reduced from 1.1 to 0.91 for the *Albatross* period and increased from 0.82 to 0.99 for the *Bigelow* period with increasing λ. The influences of the female apical selectivity for the *Bigelow* period on the population estimates were more significant because the *Bigelow* survey caught more males than females for all years (Figure 46). The increases in apical female selectivity indicated that more females should be in the population than what was observed in the survey. As a result, the model increased the female sex ratio and estimated more females in the population with increasing λ (Figure 47).

The combination of increasing total population, recruitment, and female sex ratio results in an increase in spawning output and a decrease in fishing mortality with increasing λ (Figures 48 and 49). The final model was chosen so that the female apical selectivity from the *Albatross* and *Bigelow* period are the same.

5 Retrospective Analysis

A 7-year peel retrospective analysis was conducted for the base case model. The results indicated that the model has a minor retrospective pattern with Mohn's $\rho = -0.09$ for the spawning output and 0.06 for the fully recruited fishing mortality (Figures 50-51).

6 References

Carvalho F, Winker H, Courtney D, Kapur M, Kell L, Cardinale M, Schirripa M, Kitakado T, Yemane D, Piner KR, Maunder MN. 2021. A cookbook for using model diagnostics in integrated stock assessments. Fisheries Research, 240, p.105959

Fowler GM, Campana SE. 2015. Framework assessment and 2013 update using a stage-based population model for spiny dogfish (*Squalus acanthias*) in the Northwest Atlantic. DFO Canadian Science Advisory Secretariat Research Document 2015/065. v + 134 p.

Jensen, AC, Edwards RL, Matthiessen GC. 1961. The spiny dogfish - a review. U.S. National Marine Fisheries Service, Northeast Fisheries Science Center Reference document, 61-07, 42 p.

Methot RD, Wetzel CR, Taylor IG, Doering KJ. 2021. Stock synthesis user manual: version 3.30.18

Nammack MF, Musick JA, Colvocoresses JA. 1985. Life history of spiny dogfish off the Northeastern United States. Transactions of the American Fisheries Society, 114(3): 367-376

NEFSC [Northeast Fisheries Science Center]. 2022. Research track assessment of Northwest Atlantic spiny dogfish. US Dep. Commer., Northeast Fisheries Science Center Reference Document, in press

Table 1: Summary of Atlantic spiny dogfish data by gear and fleet used in SS3.

Type	Gear	Fleet	Label in SS3
Landings	Sink Gill Net + Others Recreational	1	Landings_SGN_Rec_Others
Landings	Longline Otter Trawl + Foreign Fleet	2	Landings_LL_OT_Foreign
Discard	Sink Gill Net Scallop Dredge	3	Discard_SGN_SD
Discard	Longline Large Mesh Otter Trawl Recreational	4	Discard_LMOT_LL_Rec
Discard	Small Mesh Otter Trawl	5	Discard_SMOT
Survey	NEFSC Spring Bottom Trawl Offshore Yankee 36 1968-1972	6	NEFSC_Spring_BTS_OFFSHORE_Y36
Survey	NEFSC Spring Bottom Trawl Offshore Yankee 41 1973-1981	7	NEFSC_Spring_BTS_OFFSHORE_Y41
Survey	NEFSC Spring Bottom Trawl Inshore+Offshore 1982-2022	8	NEFSC_Spring_BTS

Table 2: Summary of total biomass by sex, spawning output (1,000s), recruitment (1,000s, age-0) and fishing mortality (age-12+) by year estimated by SS3 for Atlantic spiny dogfish.

Year	Total Biomass (mt)		Spawning	Recruitment	F
	Female	Male	Output (1,000s)	(1,000s)	(age-12+)
1924	954497	718806	938549	211968	0.002
1925	953700	718429	937653	212007	0.001
1926	953202	718201	937050	212033	0.001
1927	952993	718117	936746	212046	0.008
1928	949227	716333	932441	212227	0.015
1929	941993	712922	924049	212567	0.019
1930	933378	708901	913746	212962	0.008
1931	930383	707639	909335	213122	0.004
1932	929636	707487	907355	213193	0.003
1933	929509	707650	906120	213237	0.002
1934	930012	708123	905687	213252	0.006
1935	928258	707497	902876	213349	0.011
1936	924278	705808	897597	213527	0.009
1937	921605	704771	893672	213654	0.007
1938	920154	704354	891071	213736	0.011
1939	916719	702975	886310	213881	0.010
1940	914004	701961	882309	213999	0.048
1941	893839	692417	858968	214597	0.050
1942	874495	683291	835712	215037	0.010
1943	873812	683477	832299	215088	0.011
1944	873079	683625	829054	215133	0.005
1945	875345	685248	829349	215129	0.005
1946	877641	686858	830088	215119	0.013
1947	876373	686700	827309	215156	0.004
1948	879377	688649	829392	215128	0.005
1949	881905	690322	831330	215102	0.056
1950	862225	680963	809296	215335	0.013
1951	862154	681401	807821	215345	0.009
1952	863836	682676	808464	215340	0.005
1953	867336	684813	811394	215319	0.007
1954	870027	686523	813818	215299	0.006
1955	873172	688380	817054	215270	0.008
1956	875117	689620	819247	215249	0.045
1957	860907	682821	803969	215367	0.113
1958	818991	662027	757841	215241	0.084
1959	792753	649005	726825	214714	0.078
1960	771379	638417	700114	213950	0.081
1961	750976	628227	673959	212903	0.084
1962	731536	618413	648588	211589	0.052
1963	724885	615370	636610	210860	0.053
1964	718473	612516	625317	210107	0.053
1965	712448	609819	615016	209364	0.053
1966	707080	607371	606055	208671	0.061
1967	694497	604780	586765	207033	0.050
1968	685363	597572	580230	46614	0.049
1969	671974	586702	572700	47586	0.050
1970	654261	574439	561184	102661	0.043
1971	637942	559865	556305	72874	0.045
1972	616318	544475	545625	103335	0.054

Table 2: Continued.

Year	Total Biomass (mt)		Spawning	Recruitment	F
	Female	Male	Output (1,000s)	(1,000s)	(age-12+)
1973	583243	526877	521606	70014	0.049
1974	555238	509561	505930	100067	0.053
1975	522196	491259	484676	77715	0.049
1976	492086	473374	467611	78480	0.045
1977	466848	456265	455502	95015	0.039
1978	450117	441439	449478	138822	0.038
1979	437414	427072	443337	115873	0.045
1980	421395	414020	424748	132674	0.053
1981	407357	403103	402390	156920	0.061
1982	393064	394131	375491	145041	0.071
1983	381246	386259	349529	156367	0.077
1984	370941	378948	325501	117599	0.078
1985	365724	376141	303883	207773	0.076
1986	363641	375701	285493	172721	0.075
1987	365937	378077	271585	197177	0.077
1988	369535	381442	260582	164695	0.083
1989	374321	386505	251357	192450	0.097
1990	379180	393204	242328	223895	0.170
1991	372443	396547	219501	219511	0.121
1992	372006	404902	204436	204941	0.207
1993	360719	406672	181174	181659	0.118
1994	360177	415370	166107	166553	0.107
1995	364698	424688	163647	164083	0.131
1996	364350	431171	159114	159534	0.185
1997	354361	432972	148489	148789	0.086
1998	359672	439668	152866	150998	0.095
1999	358817	441577	156384	71060	0.074
2000	360517	442048	166173	98717	0.048
2001	363844	440117	183162	51845	0.040
2002	367828	435251	205654	63718	0.035
2003	368969	427999	228646	55935	0.019
2004	371831	420462	254648	71430	0.023
2005	371048	410777	277530	64146	0.018
2006	370265	401706	298808	93513	0.021
2007	366970	392134	315694	87945	0.026
2008	363098	384728	326579	155856	0.021
2009	361663	380745	334000	170601	0.026
2010	362053	379913	335360	210794	0.019
2011	367783	383971	334501	227210	0.030
2012	373941	393985	346988	327060	0.032
2013	358249	394338	311424	81819	0.030
2014	352166	399982	283295	230720	0.046
2015	340144	400850	253788	70414	0.033
2016	334098	402504	233505	99451	0.044
2017	325375	402434	212552	104129	0.038
2018	319616	400441	200023	78325	0.031
2019	319409	401465	193576	193546	0.042
2020	318821	402620	188899	189253	0.042
2021	318802	404738	186614	186614	0.027
2022	321401	406767	190771	136158	0.020

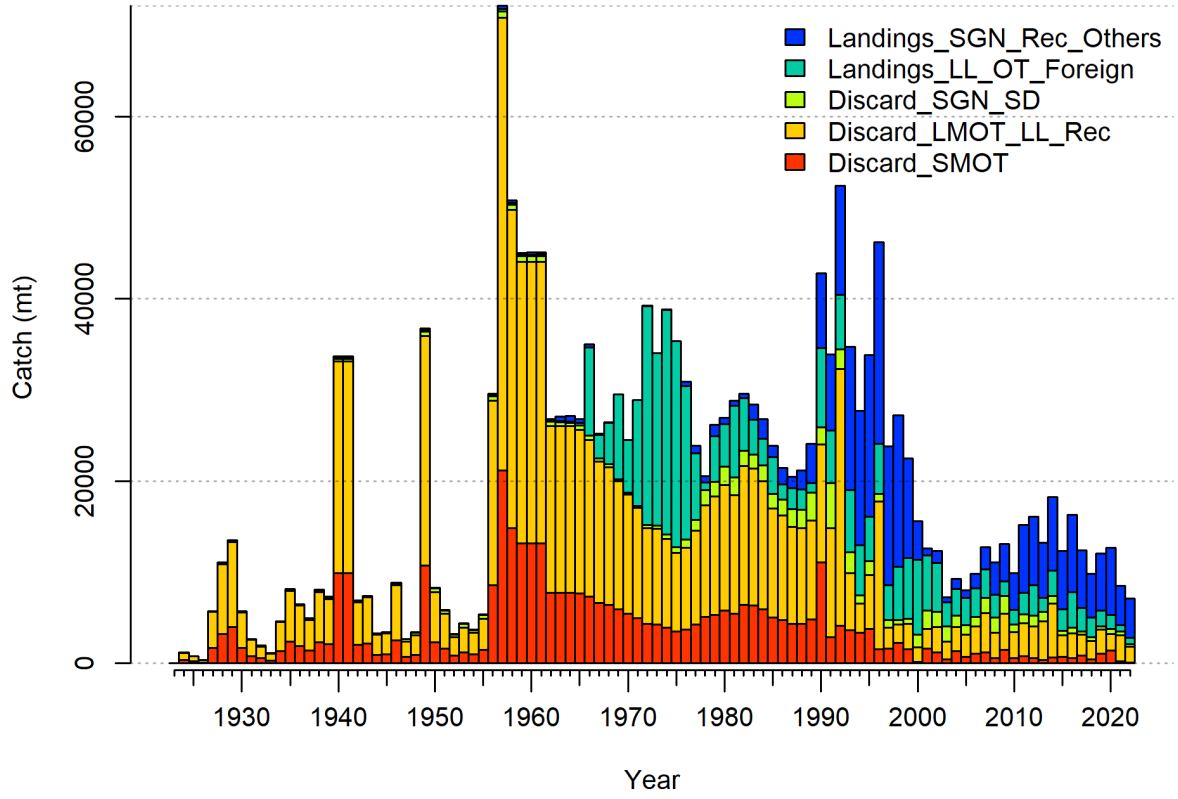

Figure 1: Time series of Atlantic spiny dogfish catch (landings plus dead discards) by fleet.

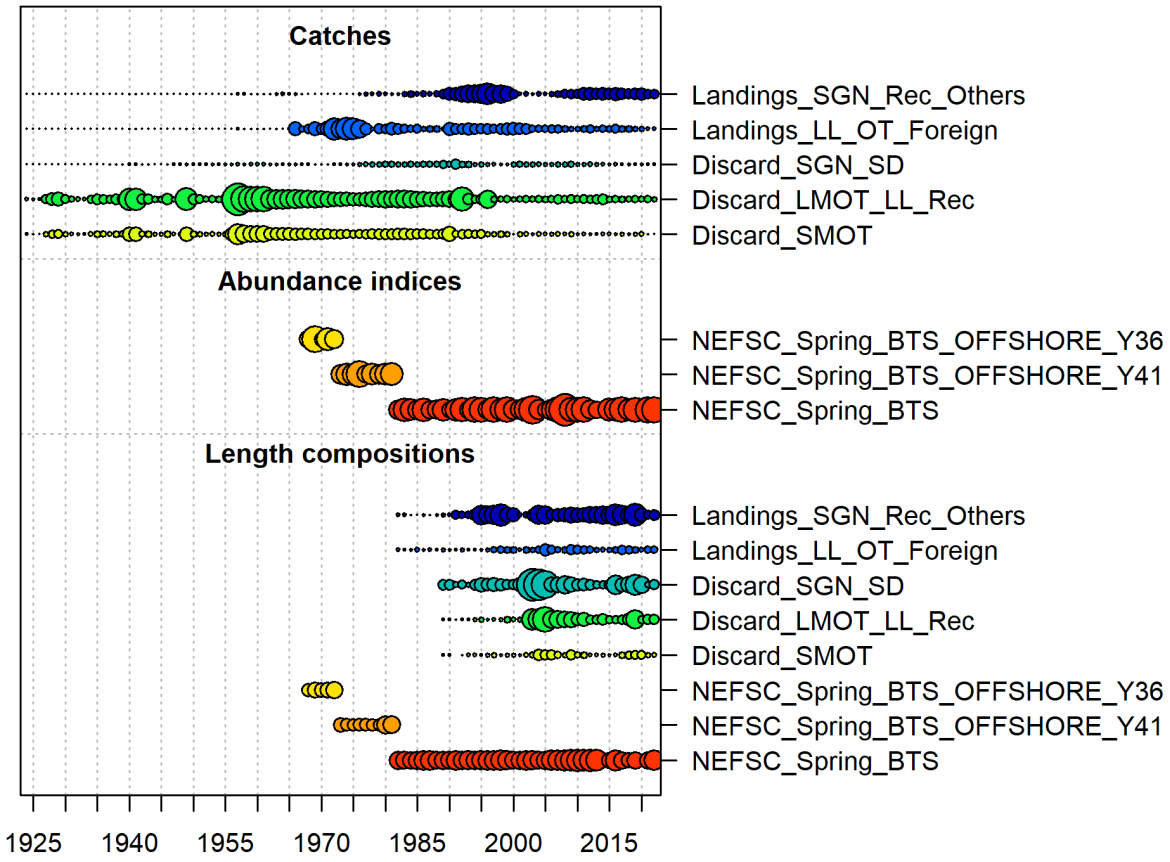

Figure 2: Catch and survey data by year for each fleet used in SS3. Circle area is relative within a data type. Circles are proportional to total catch for catches, to precision for indices, and to total sample size for length compositions. Note that since the circles are scaled relative to the maximum within each type, the scaling within separate plots should not be compared.

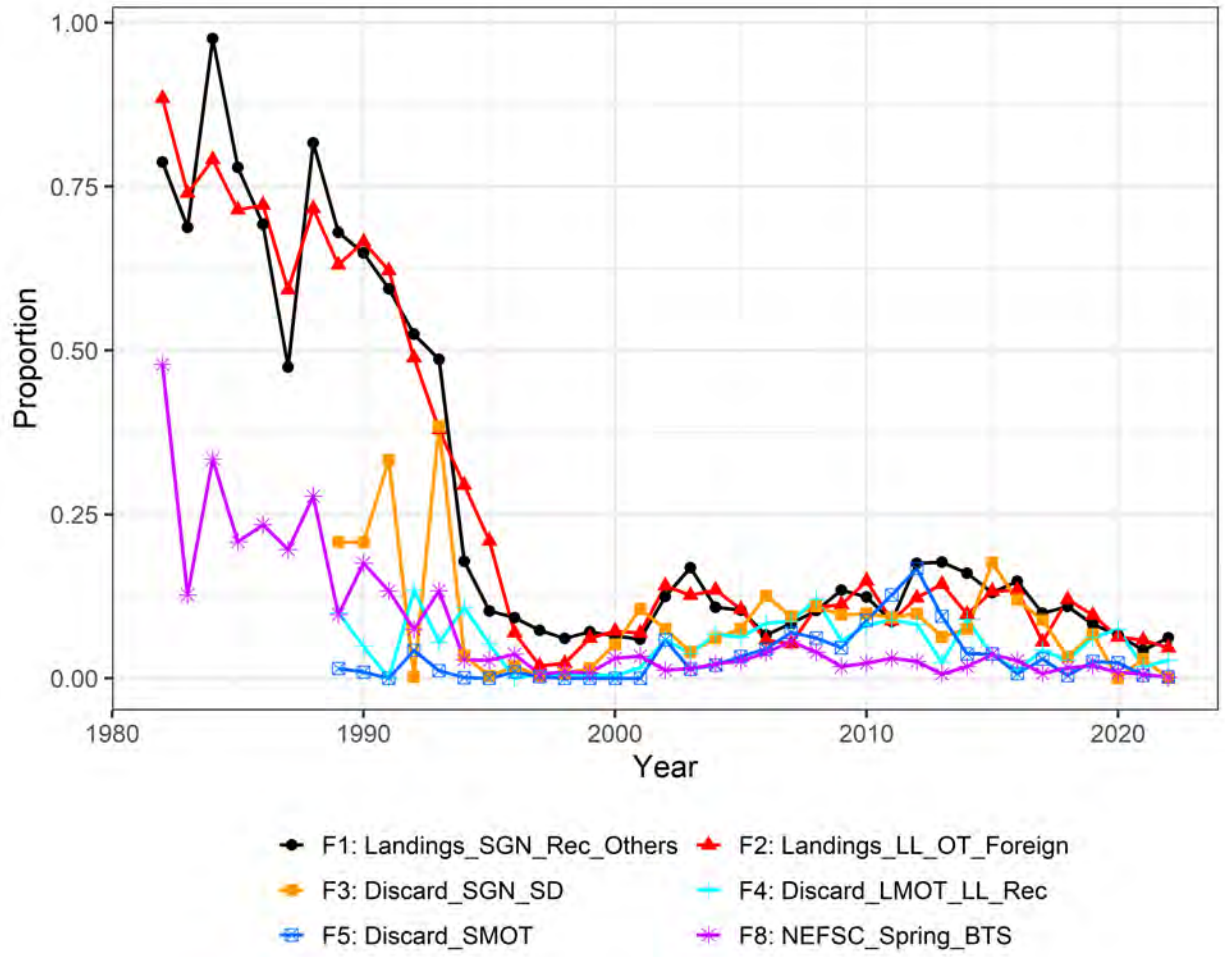

Figure 3: Proportions of 90+ cm females by fleet from 1982 to 2022.

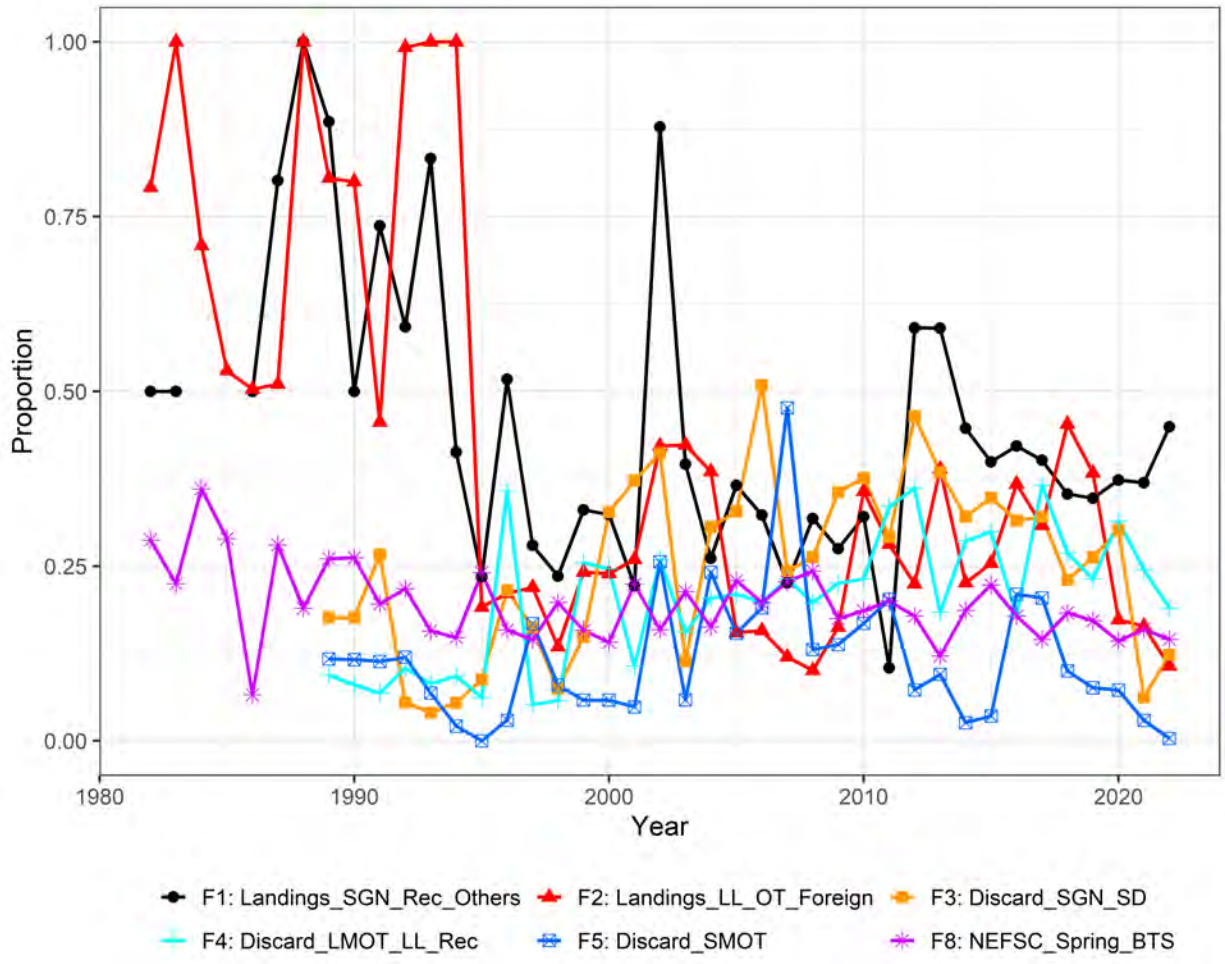

Figure 4: Proportions of 75+ cm males by fleet from 1982 to 2022.

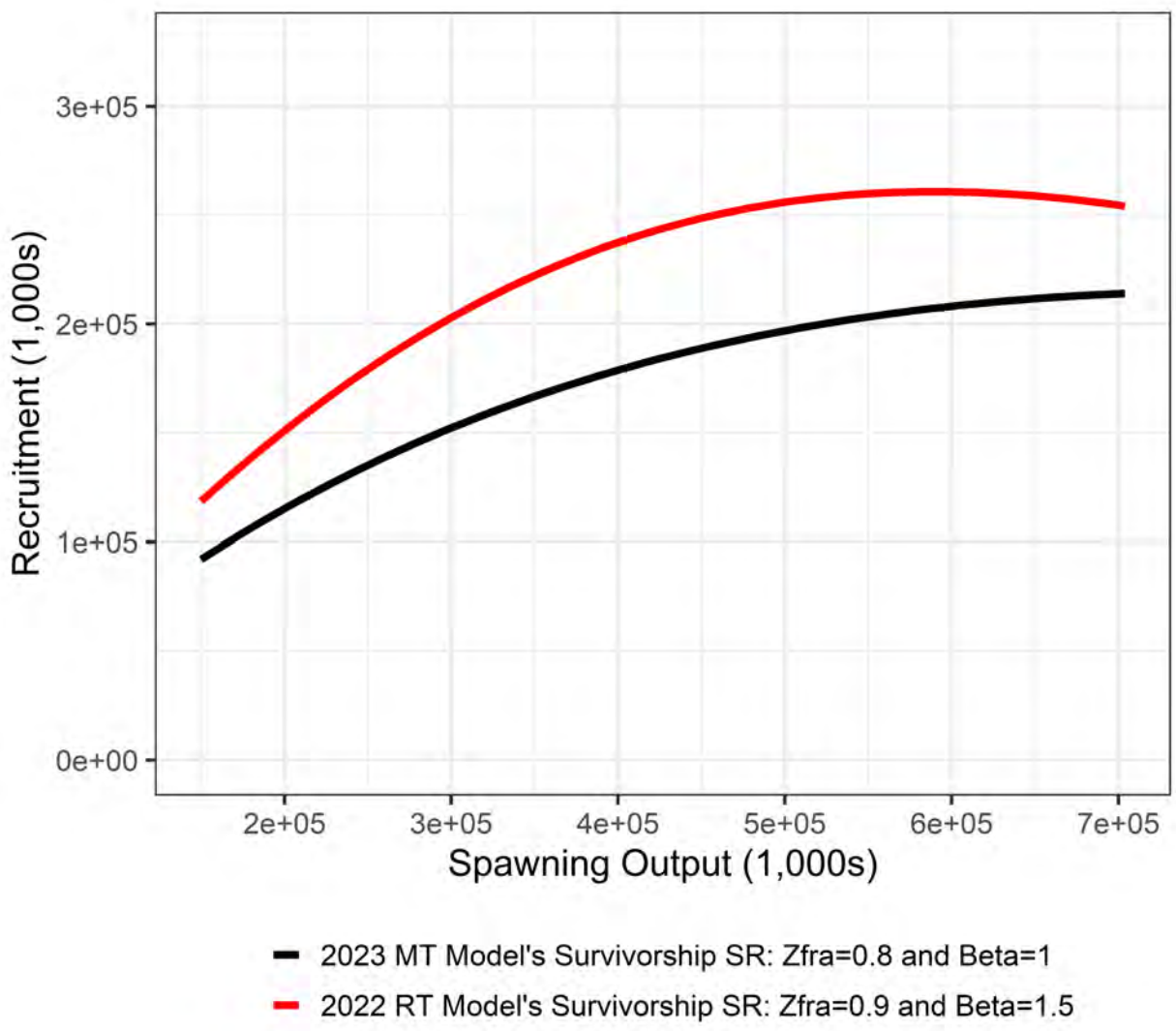

Figure 5: Comparison of survivorship spawner-recruitment relationships assumed in the 2022 research track and 2023 management track assessment model.

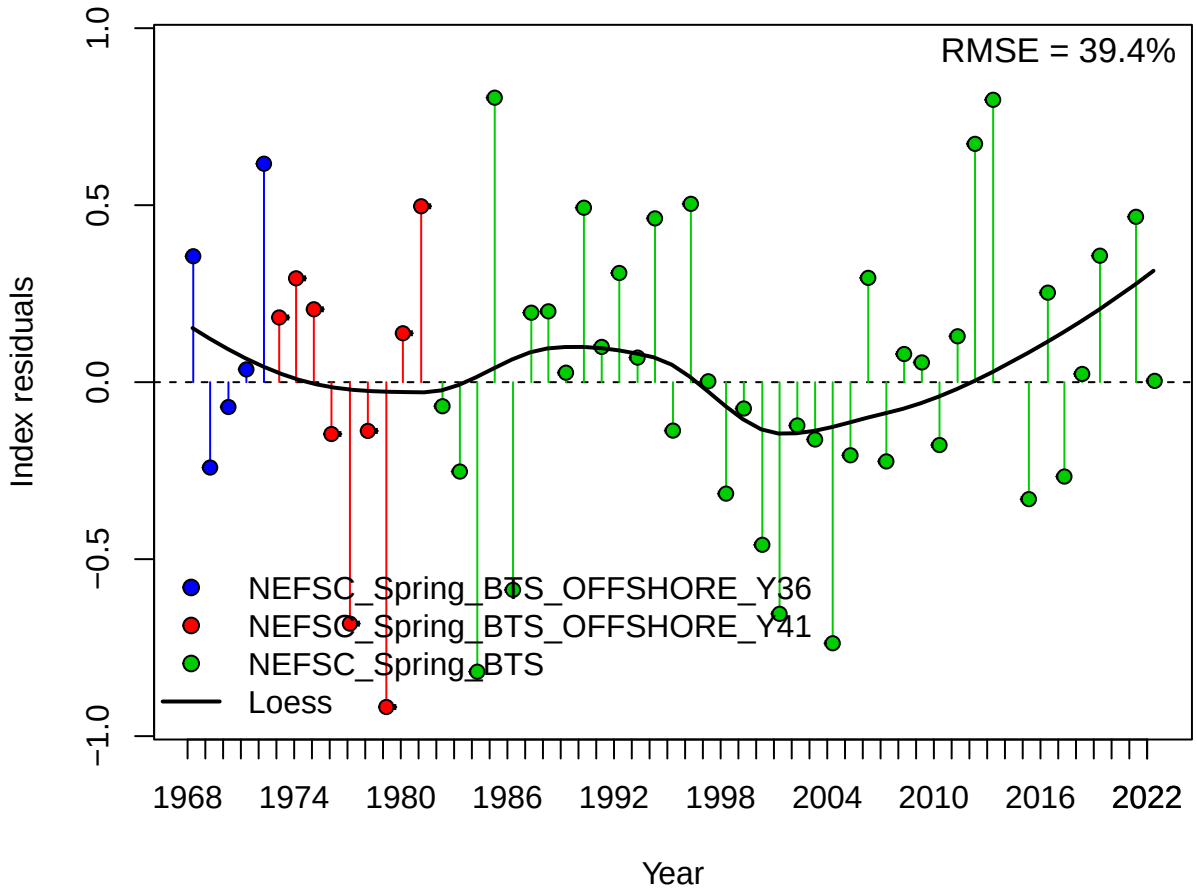

Figure 6: Joint residual plot from fit to annual survey index data.

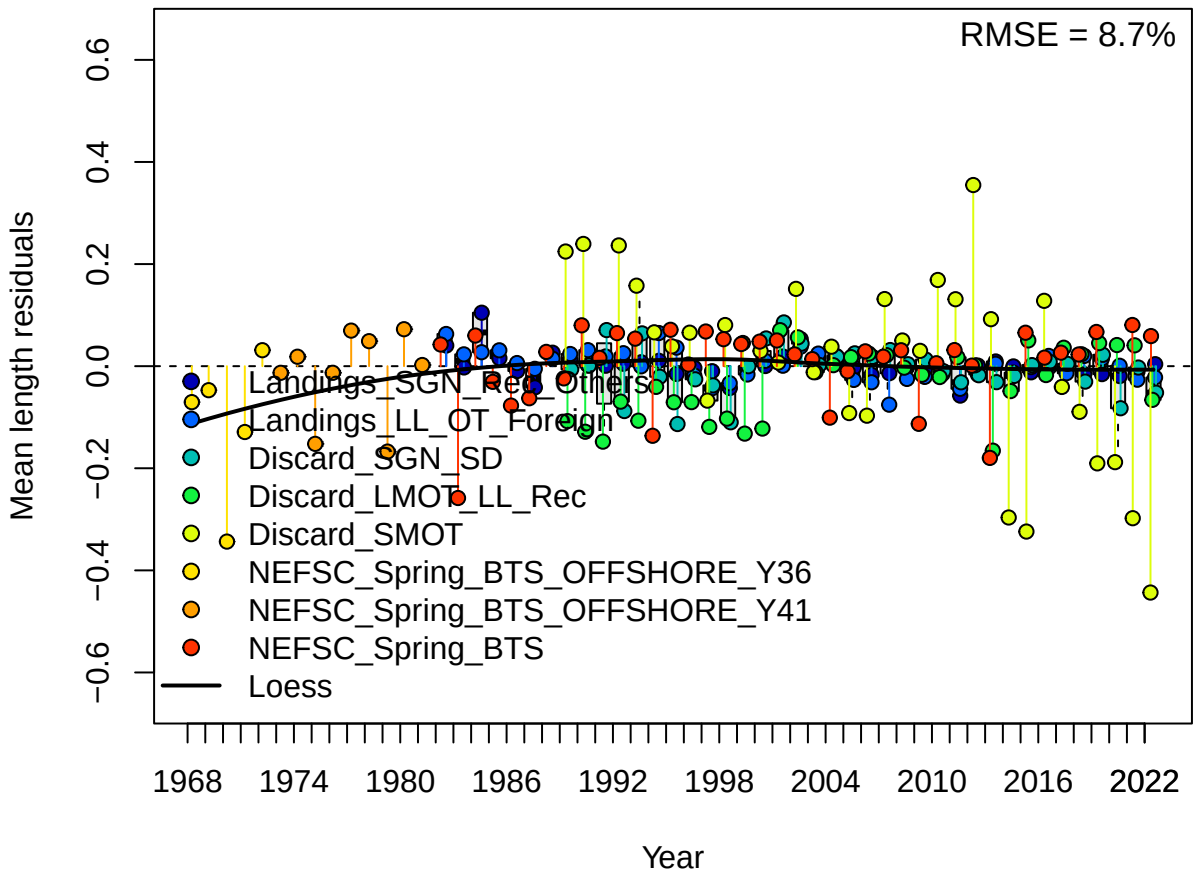

Figure 7: Joint residual plot from fit to annual mean length from length composition data.

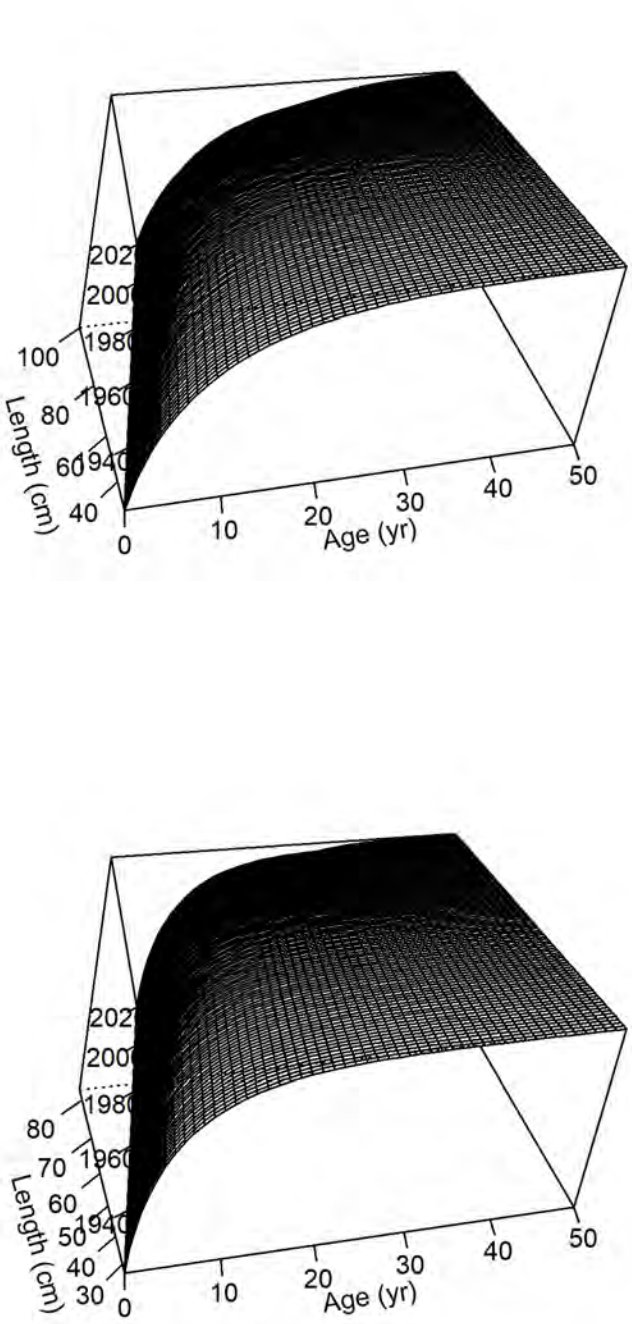

Figure 8: Surface plot of time-varying growth for females (top) and males (bottom) from 1924 to 2022.

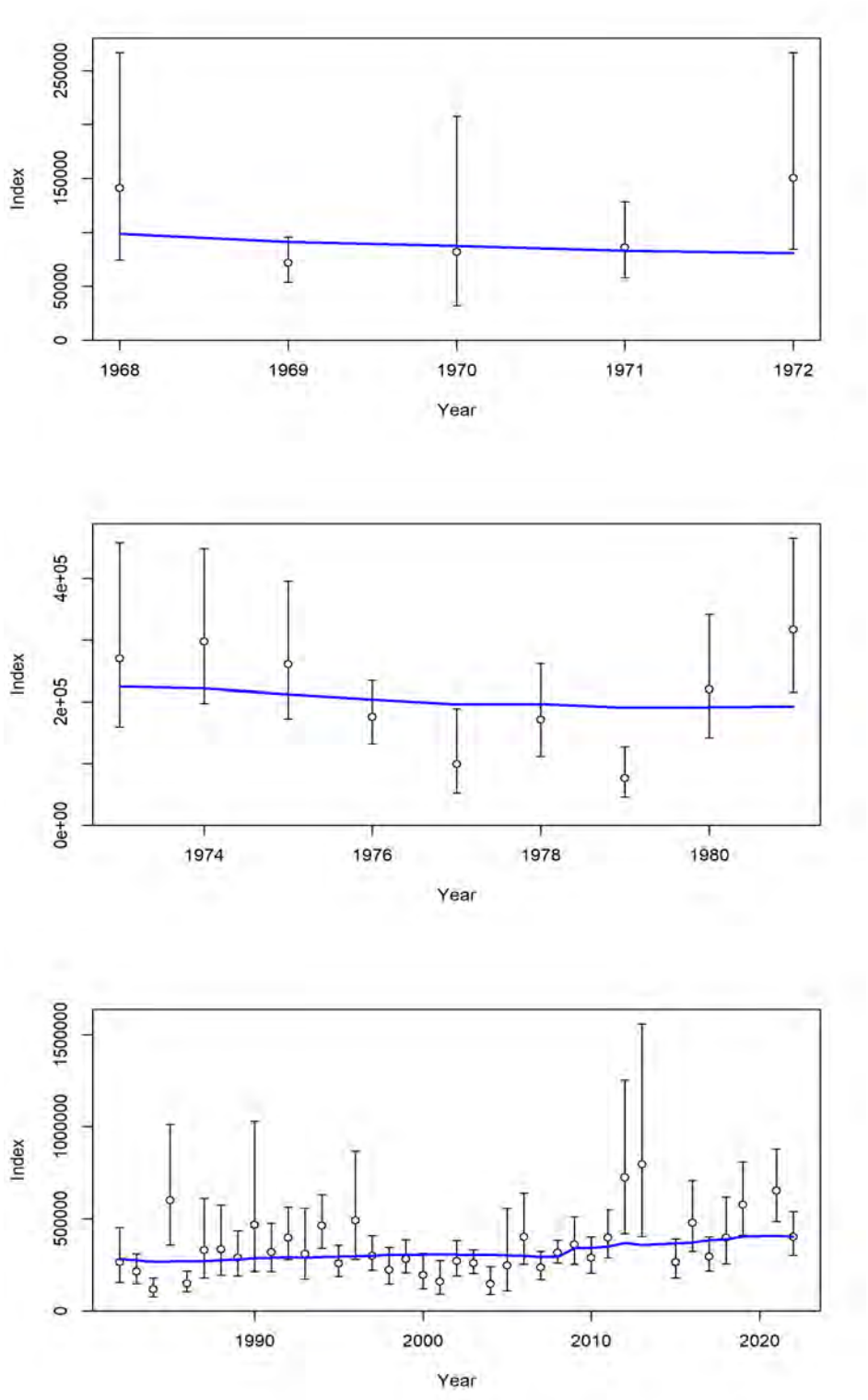

Figure 9: Observed and model-predicted abundance index (1,000s) for the NEFSC spring bottom trawl surveys. Lines indicate 95% uncertainty interval around index values based on the model assumption of lognormal error.

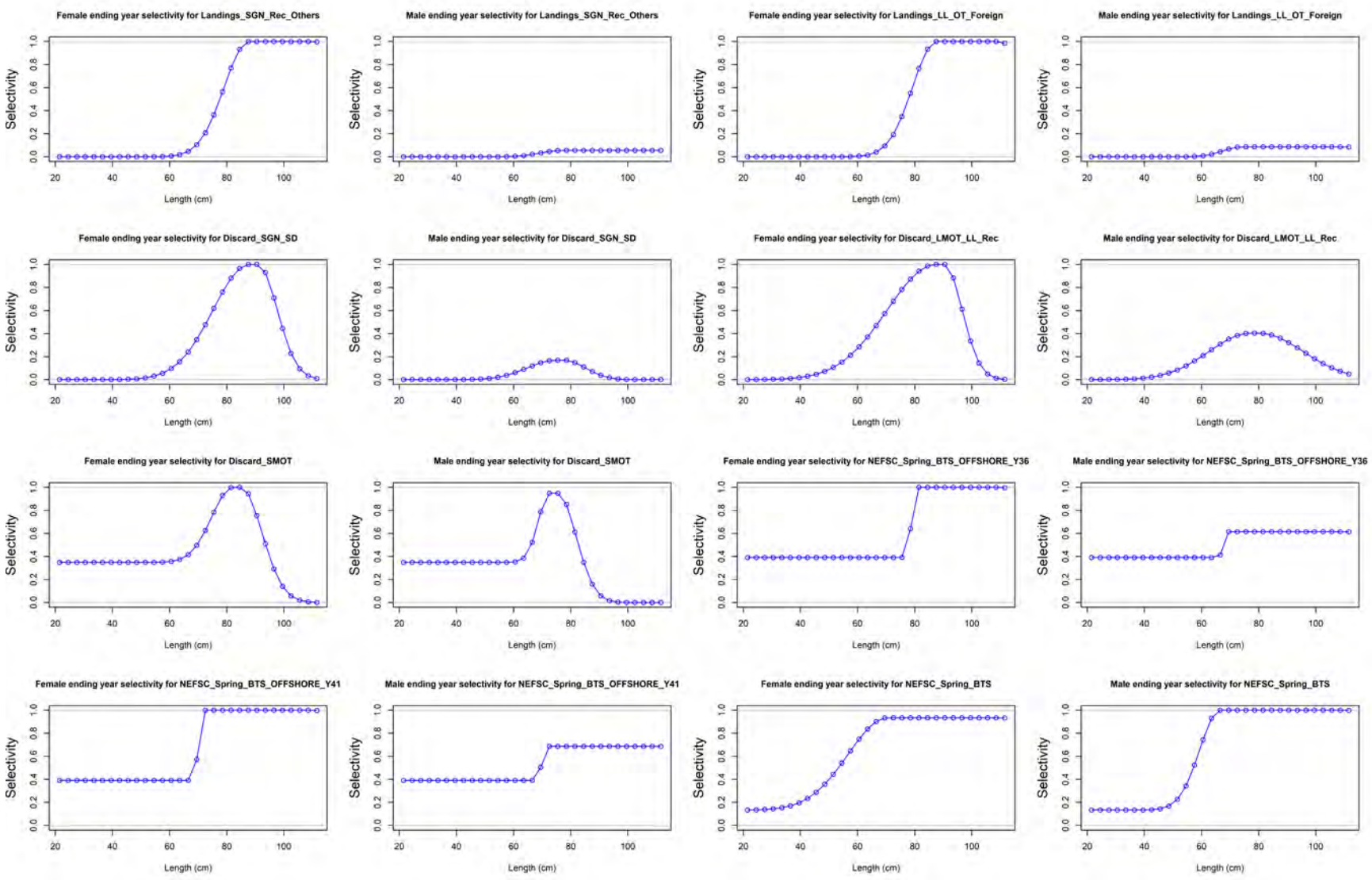

Figure 10: Estimated ending year selectivity for females and males for all fleets.

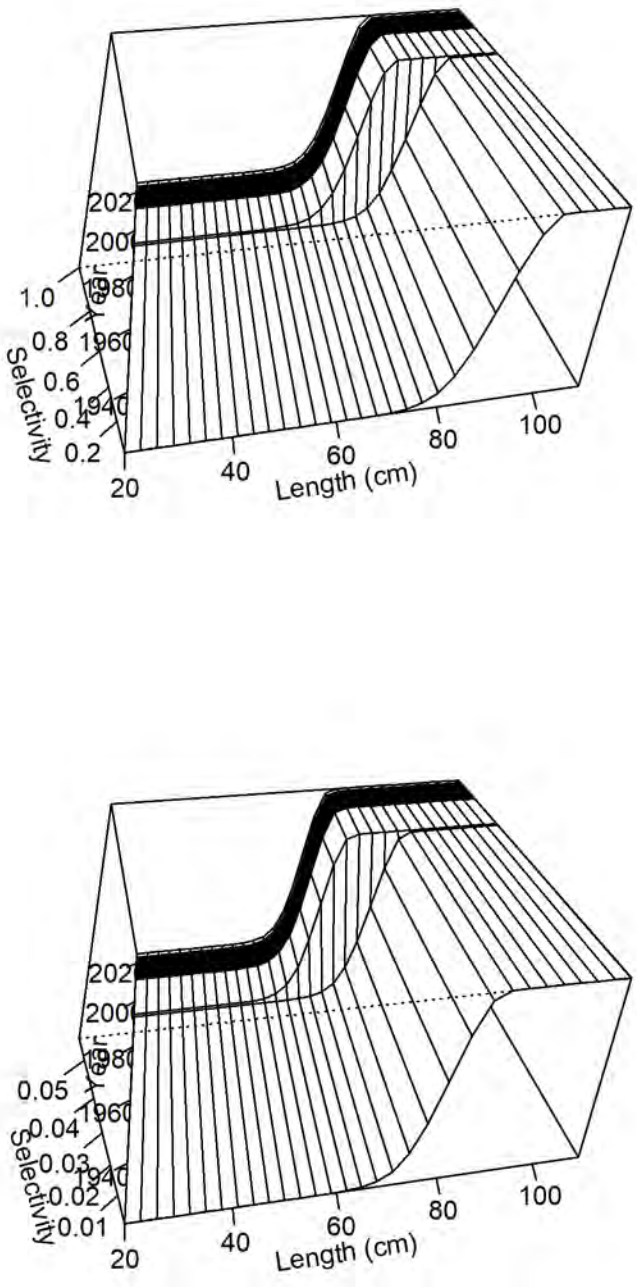

Figure 11: Surface plot of time-varying selectivity for females (top) and males (bottom) from 1982 to 2022 for fleet 1: Landings_SGN_Rec_Others.

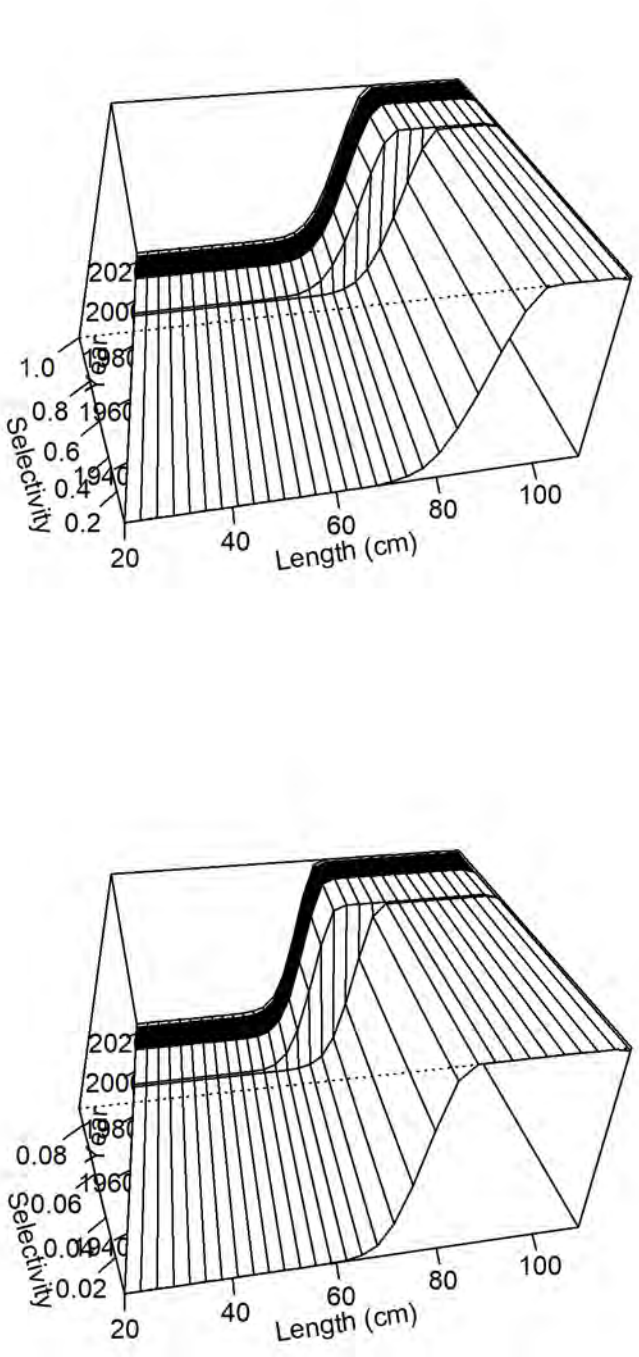

Figure 12: Surface plot of time-varying selectivity for females (top) and males (bottom) from 1982 to 2022 for fleet 2: Landings_LL_OT_Foreign.

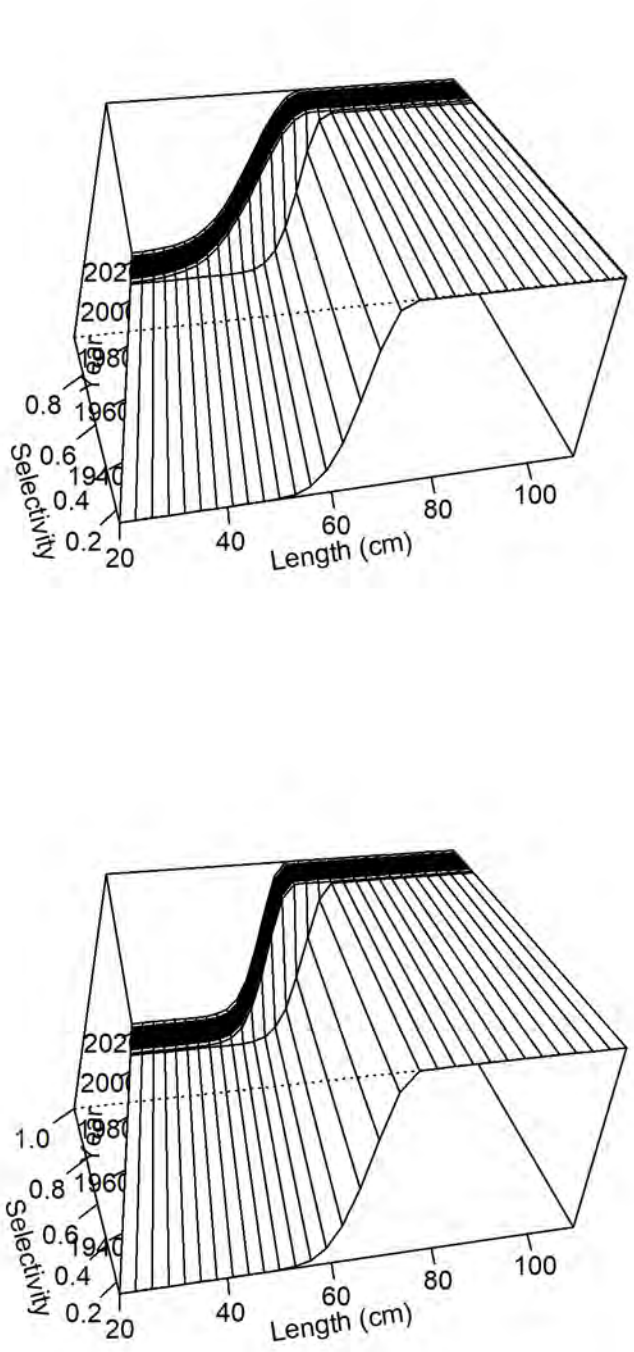

Figure 13: Surface plot of time-varying selectivity for females (top) and males (bottom) from 1982 to 2022 for fleet 8: NEFSC_Spring_BTS.

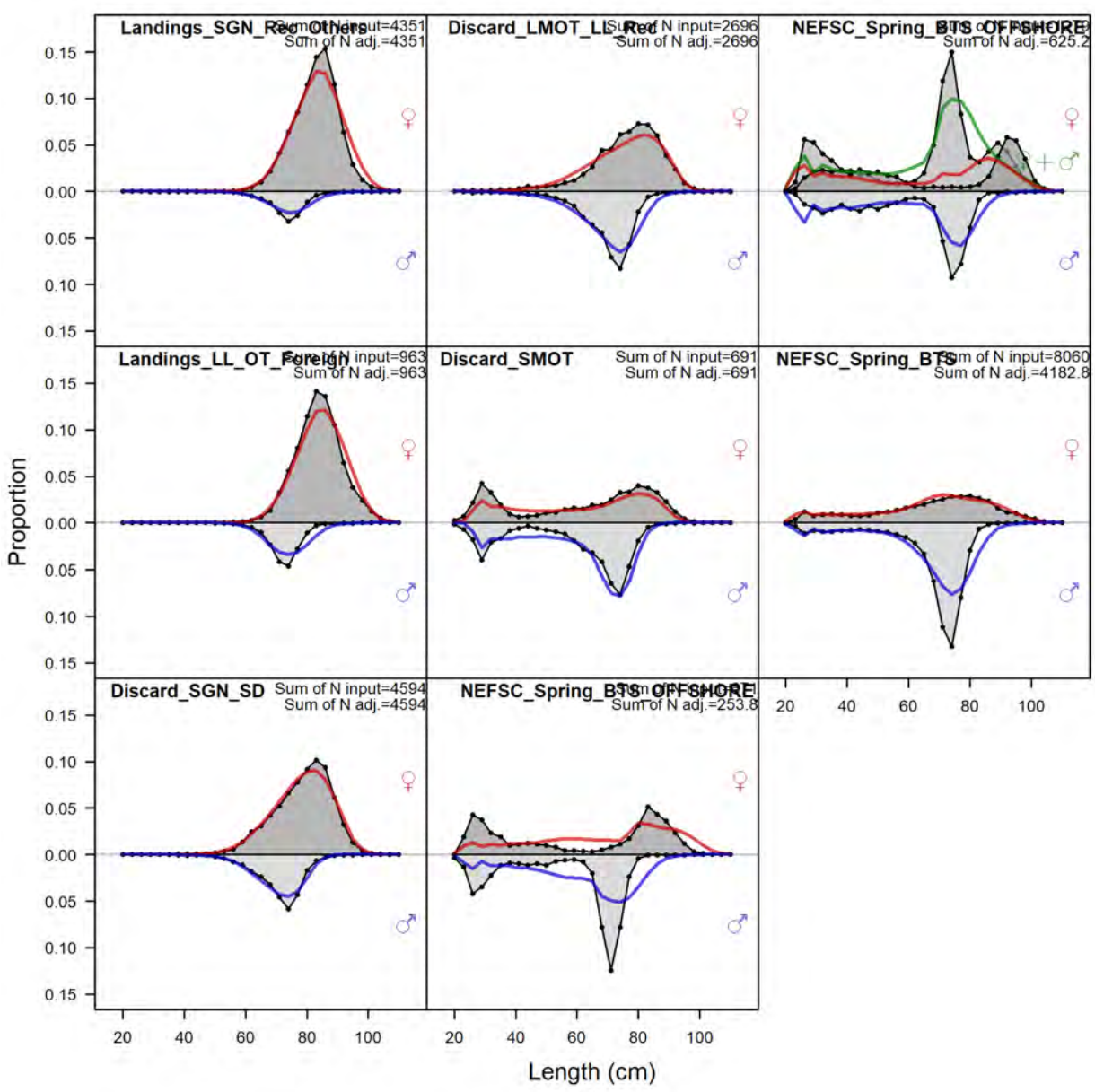

Figure 14: Observed (shaded) and model-predicted (line) length compositions, aggregated across time by fleet and sex.

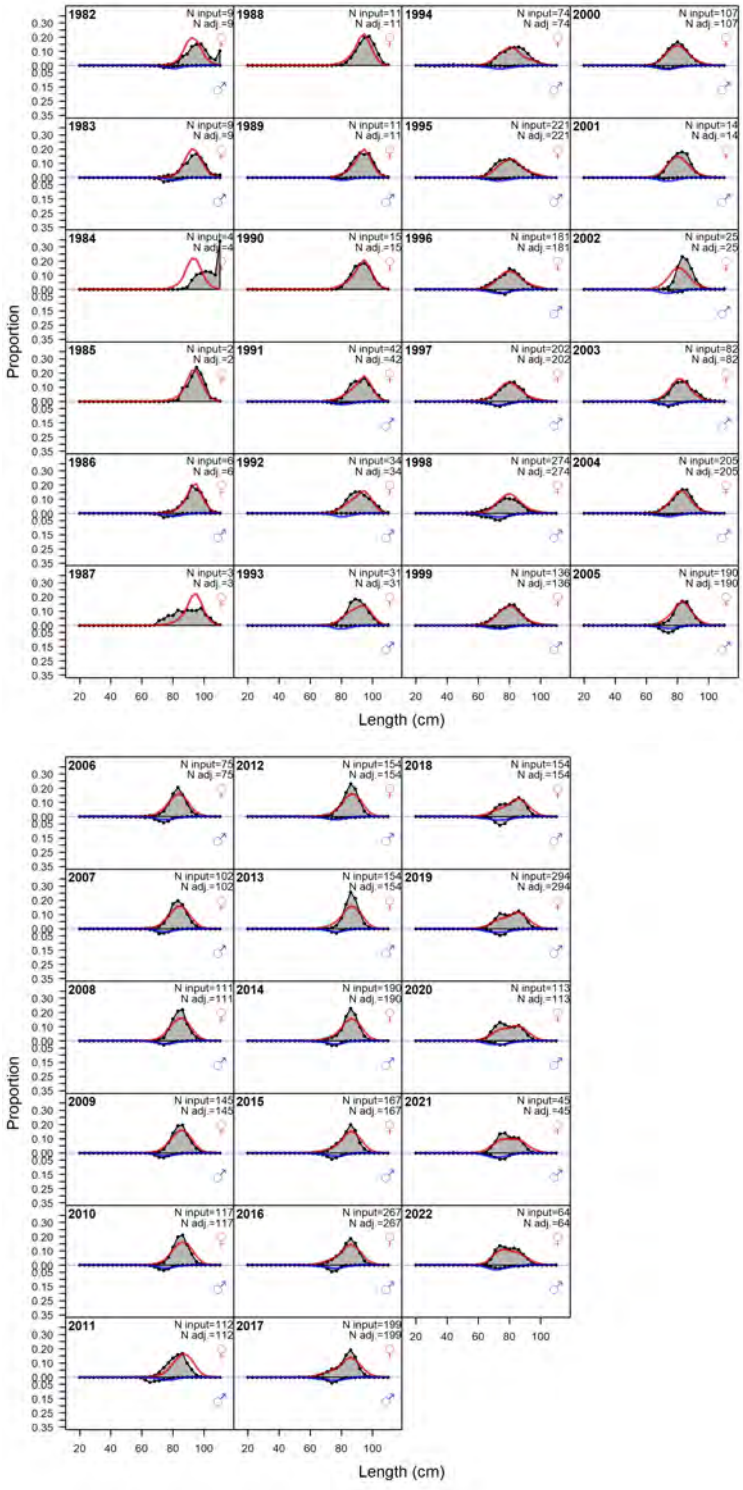

Figure 15: Fit to length compositions by year and sex for fleet 1: Landings_SGN_Rec_Others.

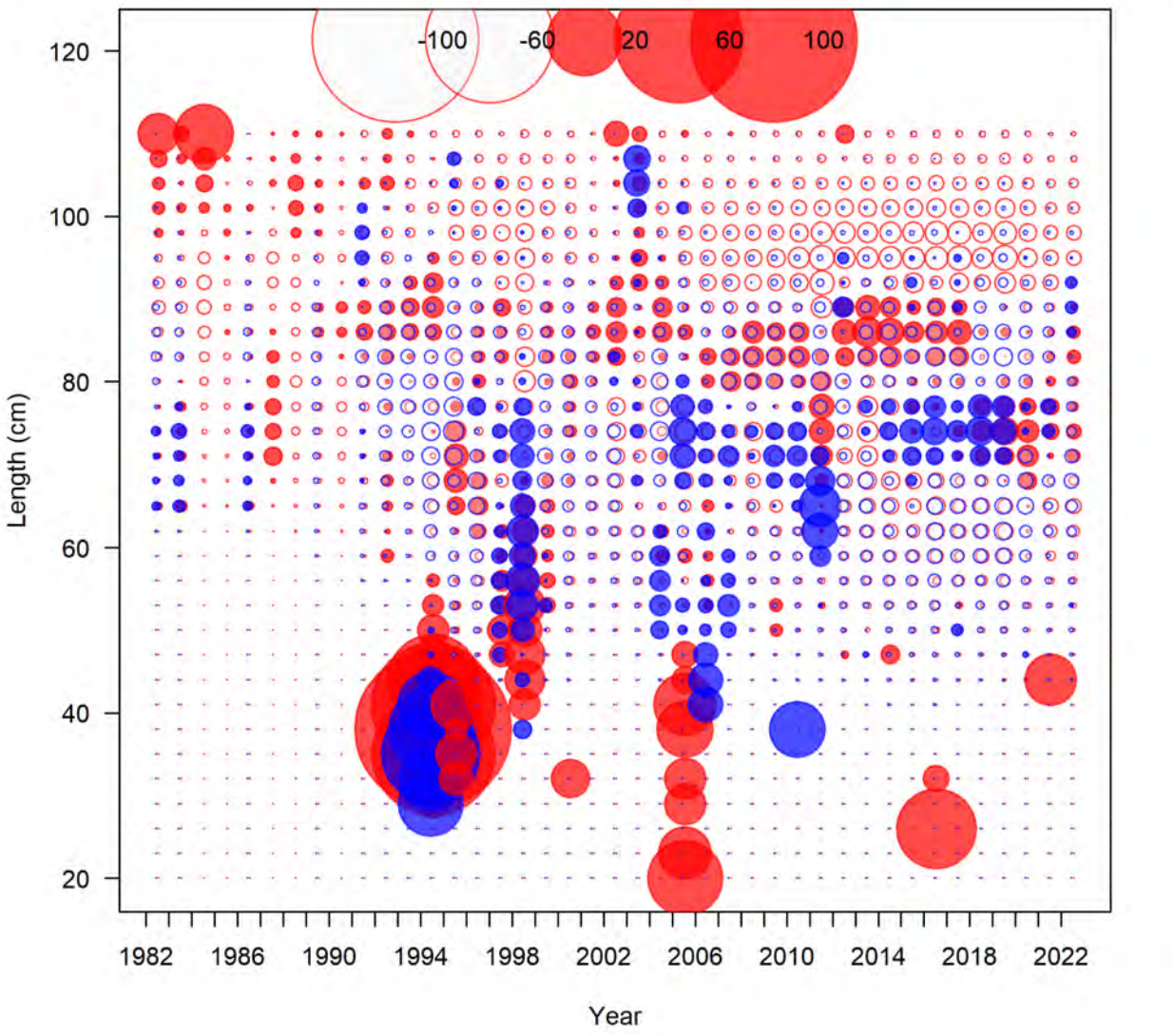

Figure 16: Pearson residuals for the fit to length compositions by year and sex for fleet 1: Landings_SGN_Rec_Others. Closed bubbles are positive residuals (observed > expected) and open bubbles are negative residuals (observed < expected).

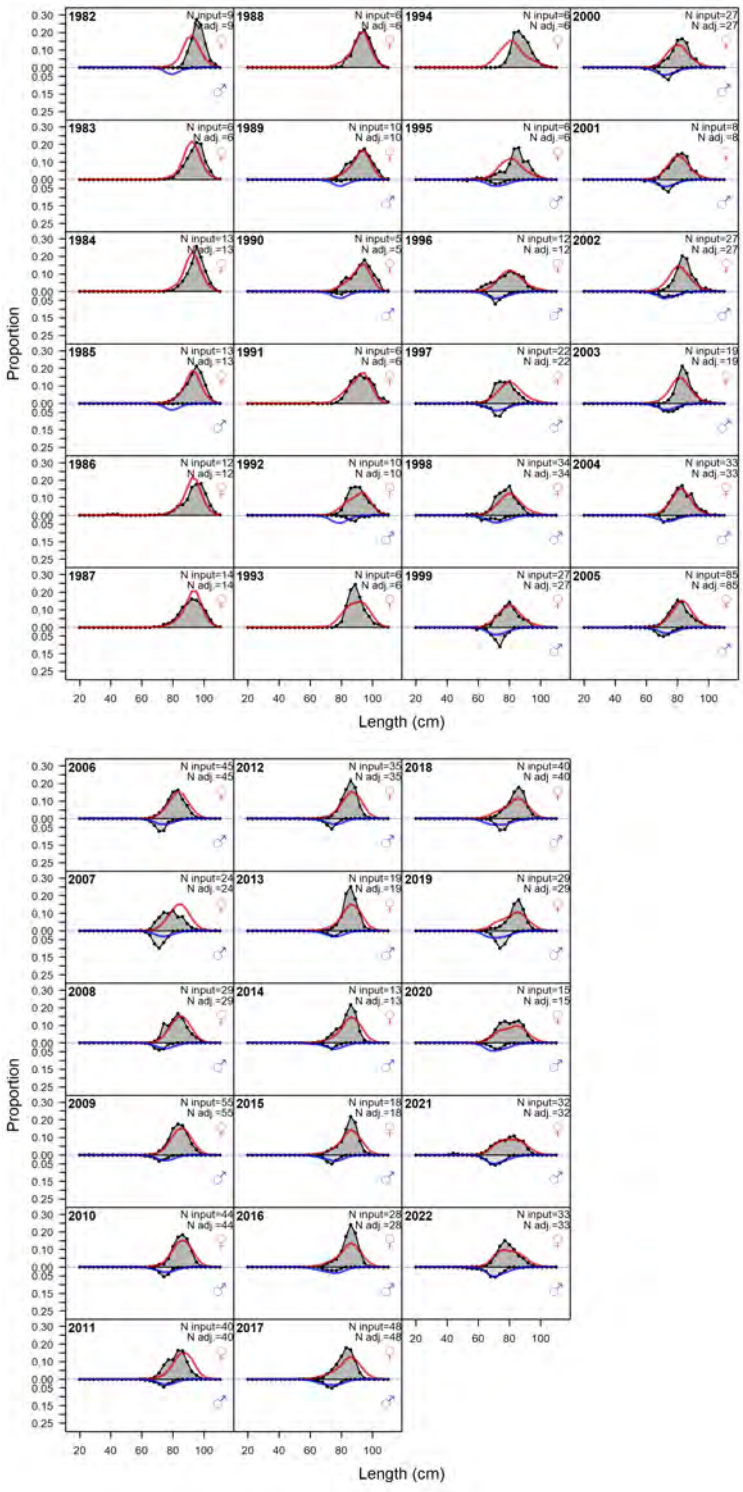

Figure 17: Fit to length compositions by year and sex for fleet 2: Landings_LL_OT_Foreign.

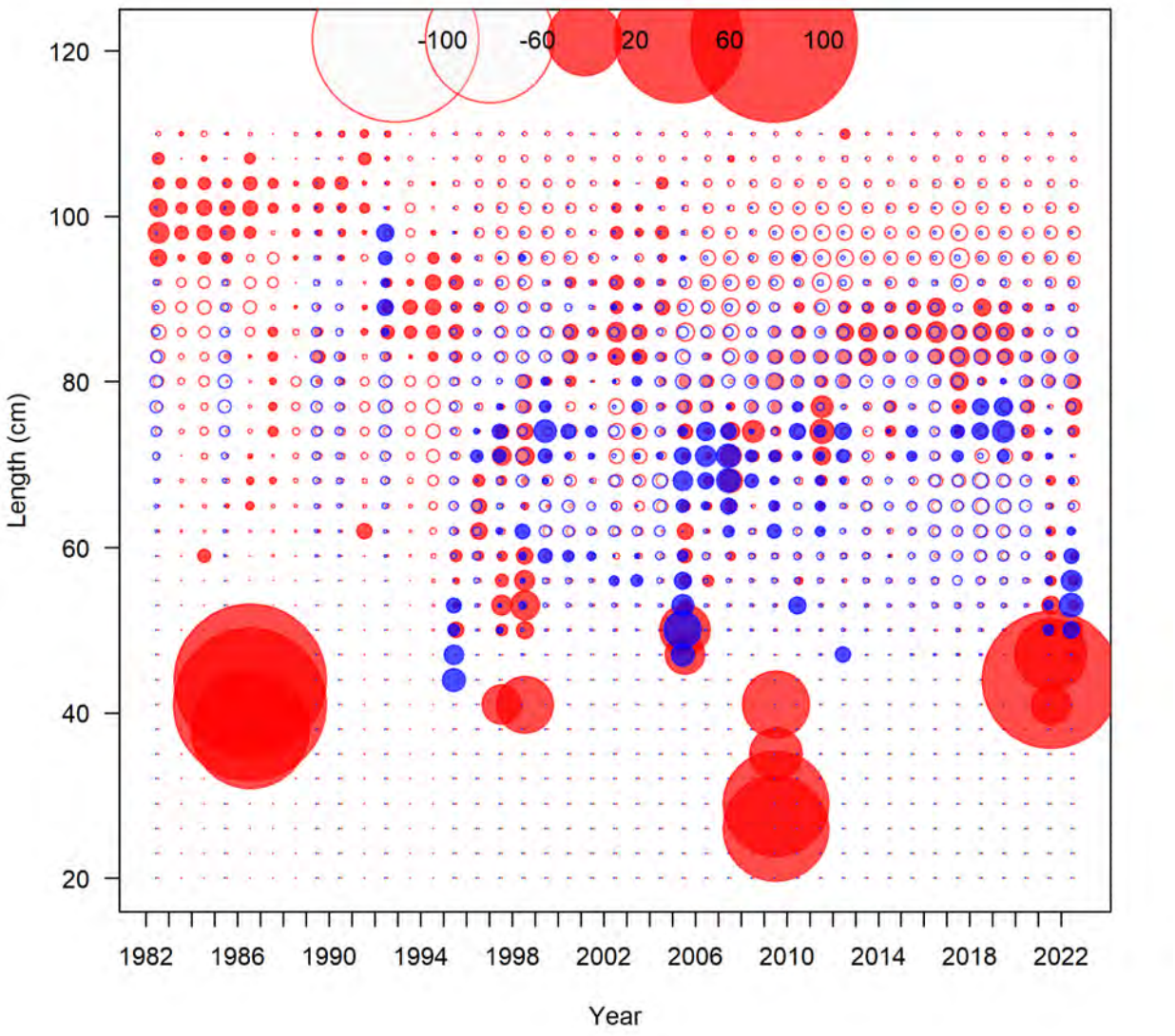

Figure 18: Pearson residuals for the fit to length compositions by year and sex for fleet 2: Landings_LL_OT_Foreign. Closed bubbles are positive residuals (observed > expected) and open bubbles are negative residuals (observed < expected).

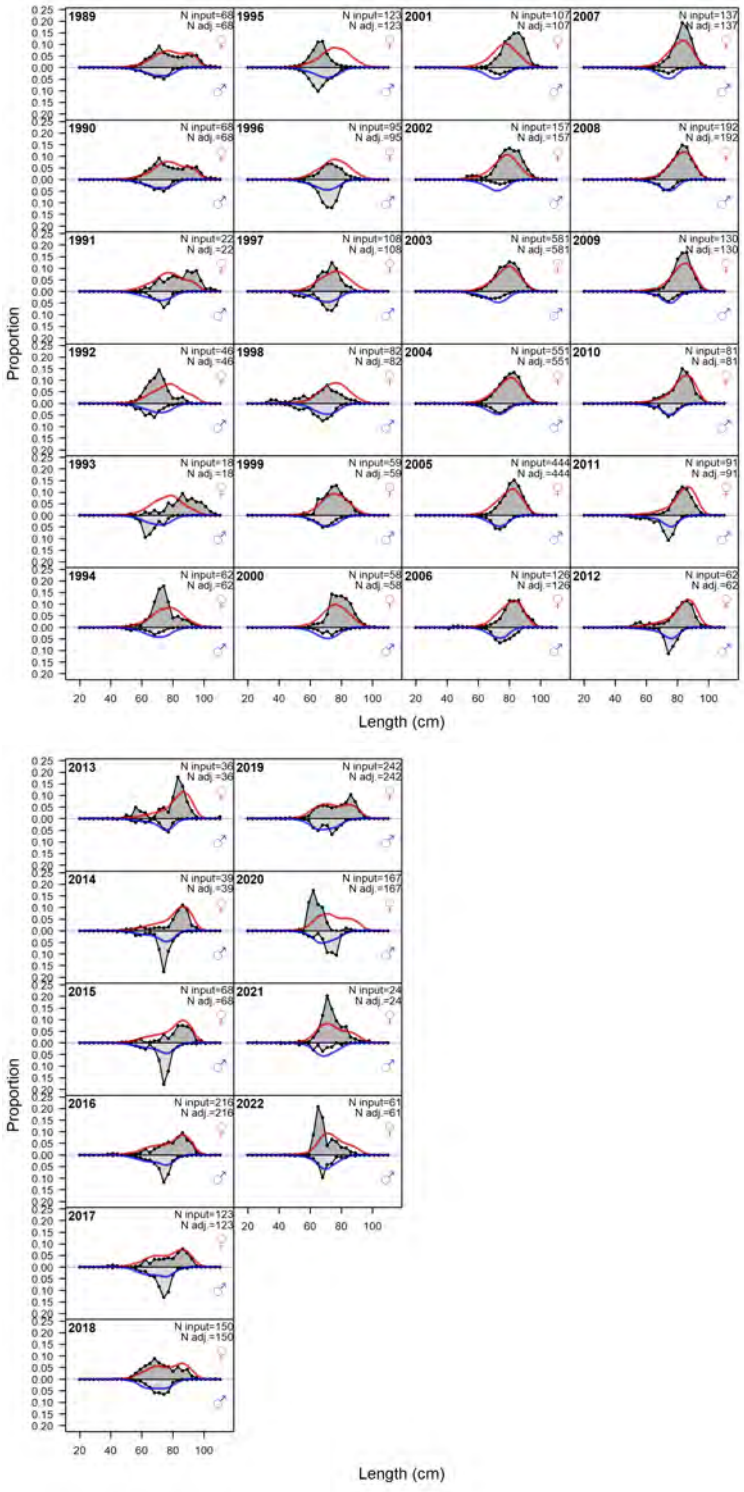

Figure 19: Fit to length compositions by year and sex for fleet 3: Discard_SGN_SD.

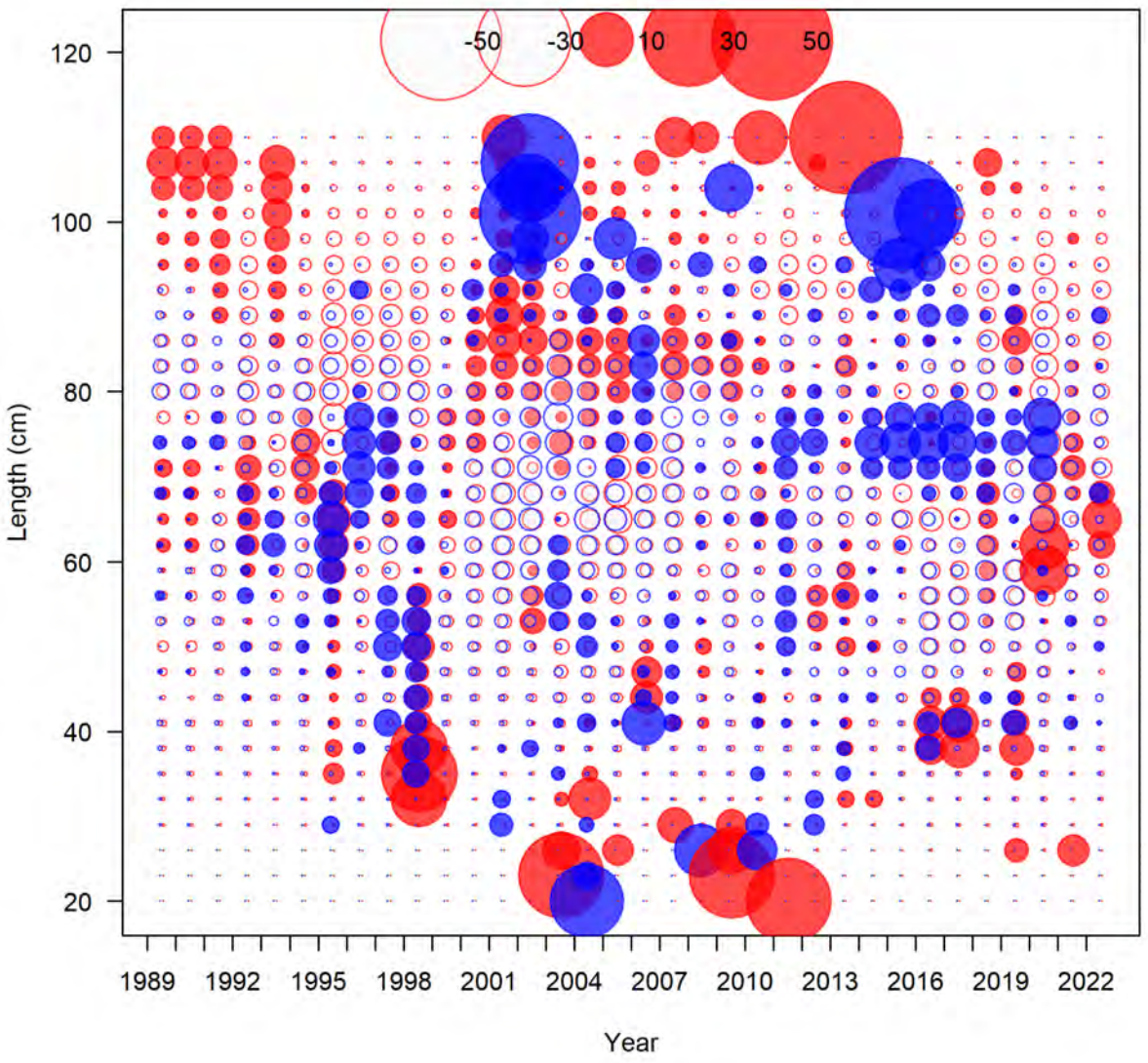

Figure 20: Pearson residuals for the fit to length compositions by year and sex for fleet 3: Discard_SGN_SD. Closed bubbles are positive residuals (observed > expected) and open bubbles are negative residuals (observed < expected).

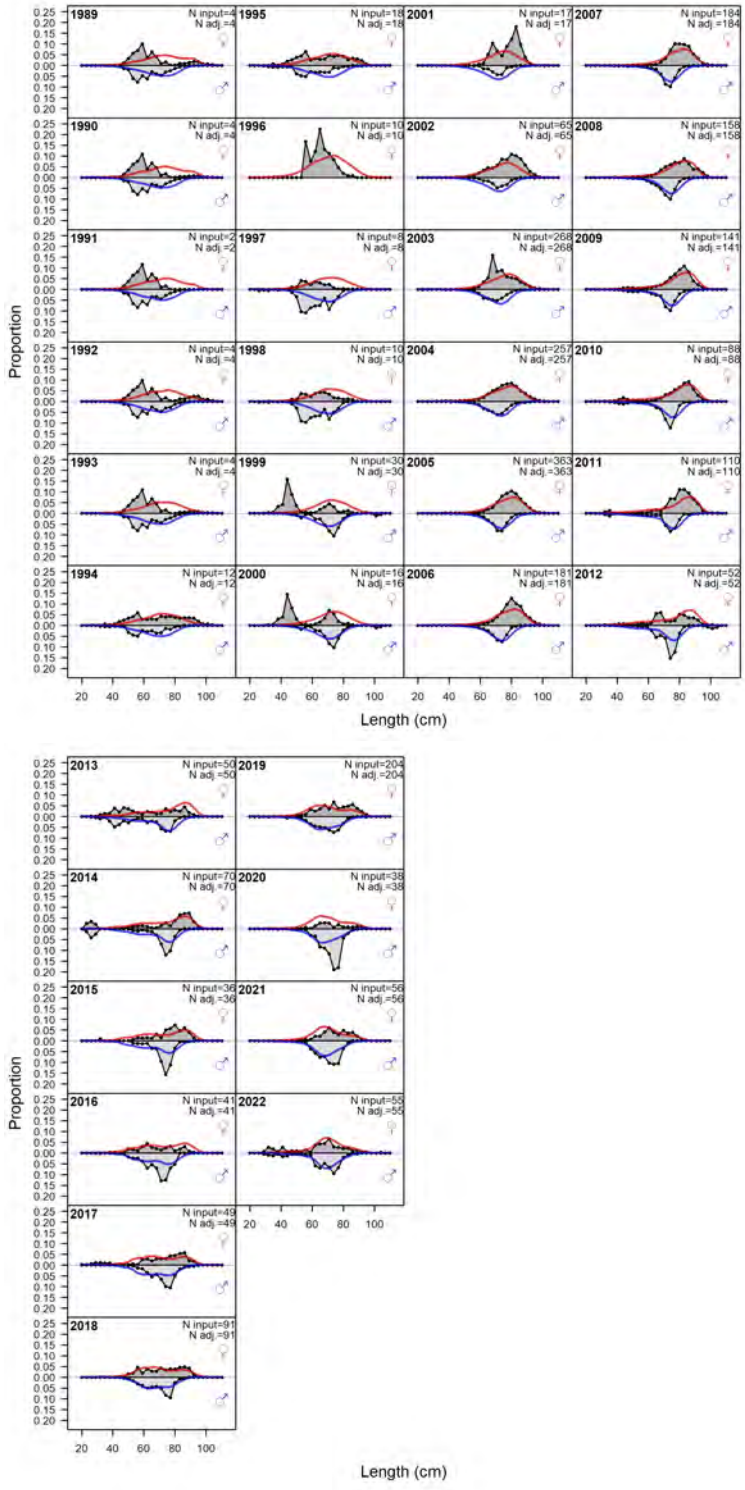

Figure 21: Fit to length compositions by year and sex for fleet 4: Discard_LMOT_LL_Rec.

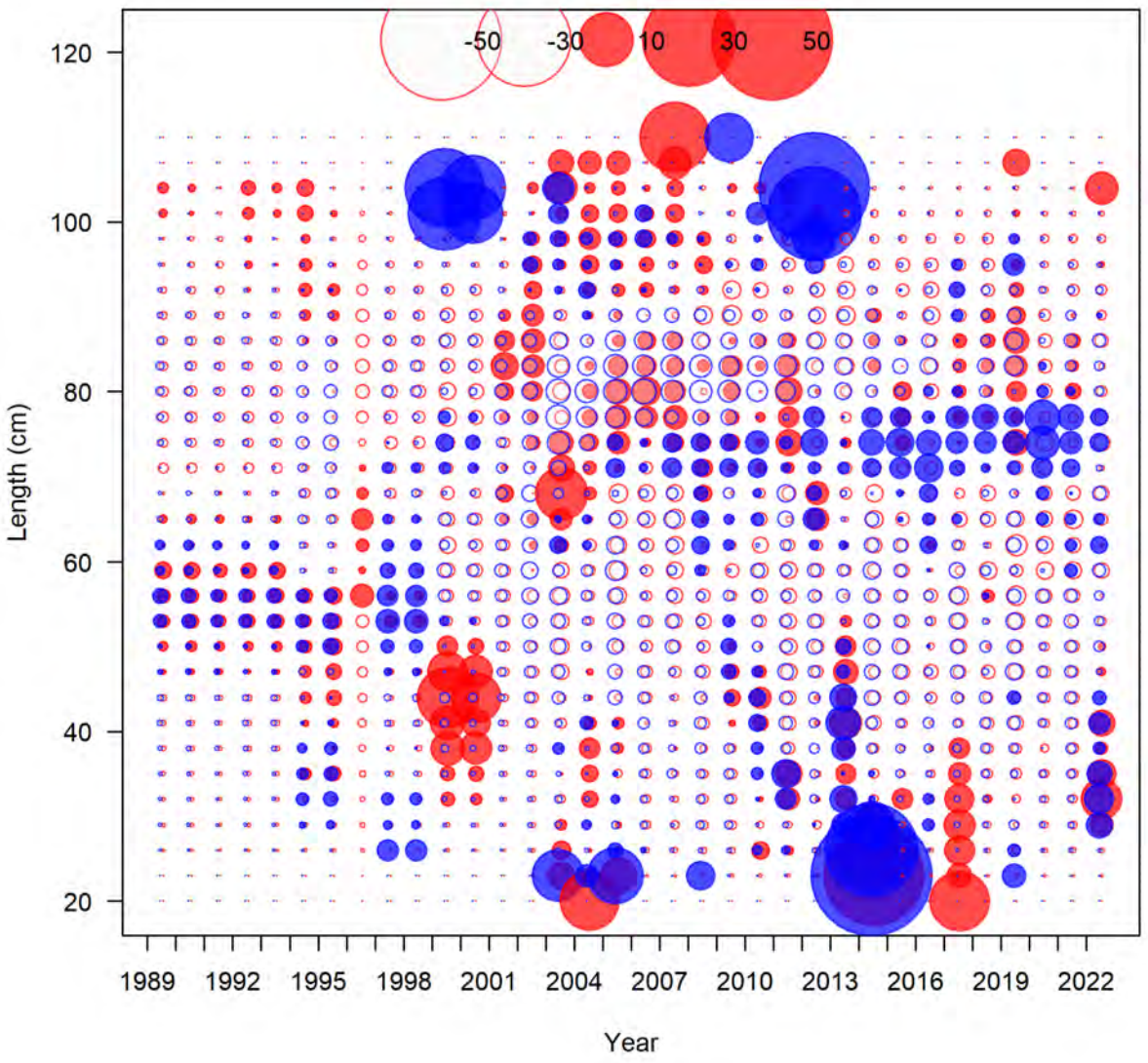

Figure 22: Pearson residuals for the fit to length compositions by year and sex for fleet 4: Discard_LMOT_LL_Rec. Closed bubbles are positive residuals (observed > expected) and open bubbles are negative residuals (observed < expected).

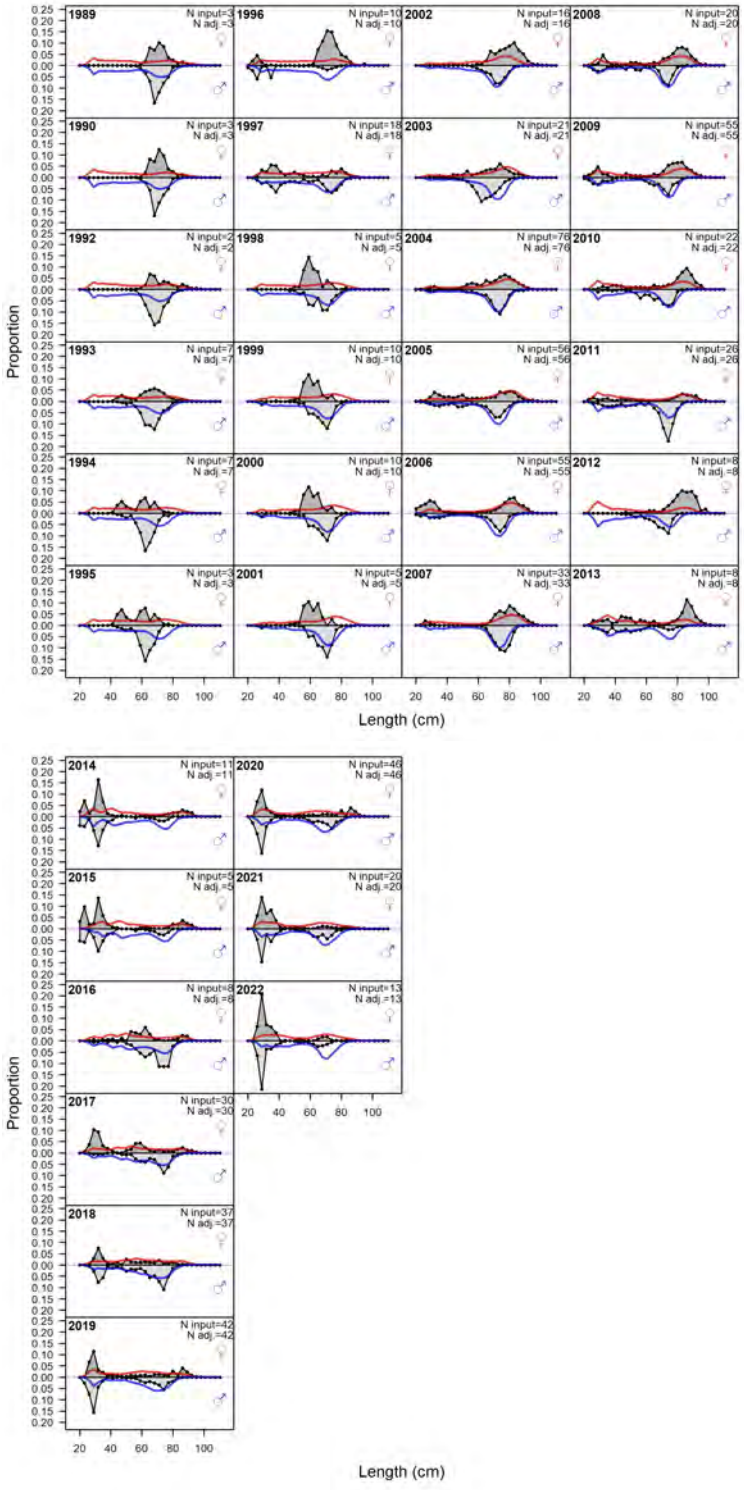

Figure 23: Fit to length compositions by year and sex for fleet 5: Discard_SMOT.

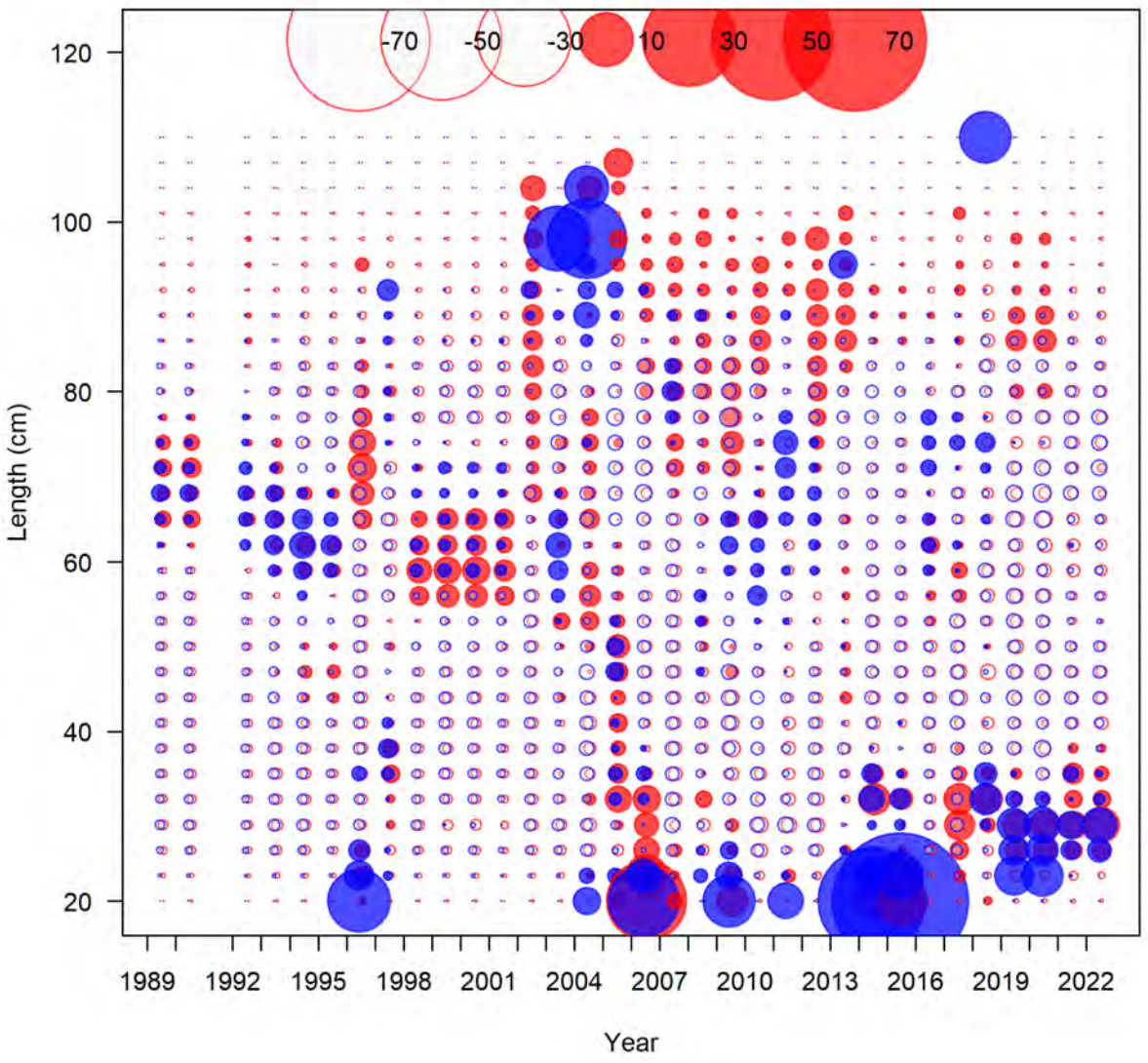

Figure 24: Pearson residuals for the fit to length compositions by year and sex for fleet 5: Discard_SMOT. Closed bubbles are positive residuals (observed > expected) and open bubbles are negative residuals (observed < expected).

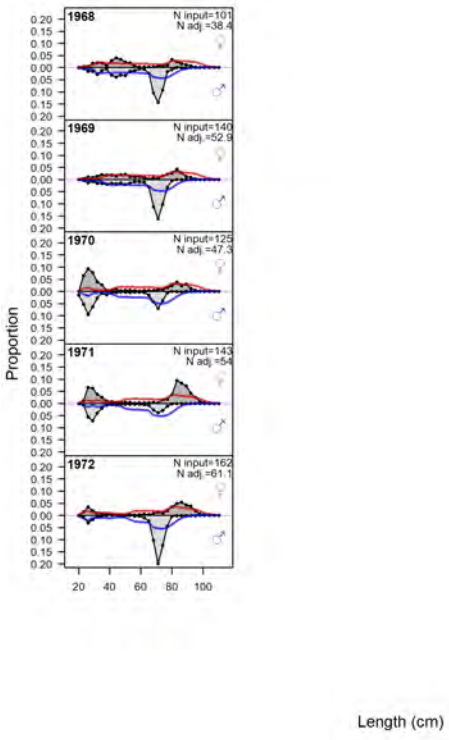

Figure 25: Fit to length compositions by year and sex for fleet 6: NEFSC_Spring_BTS_OFFSHORE_Y36.

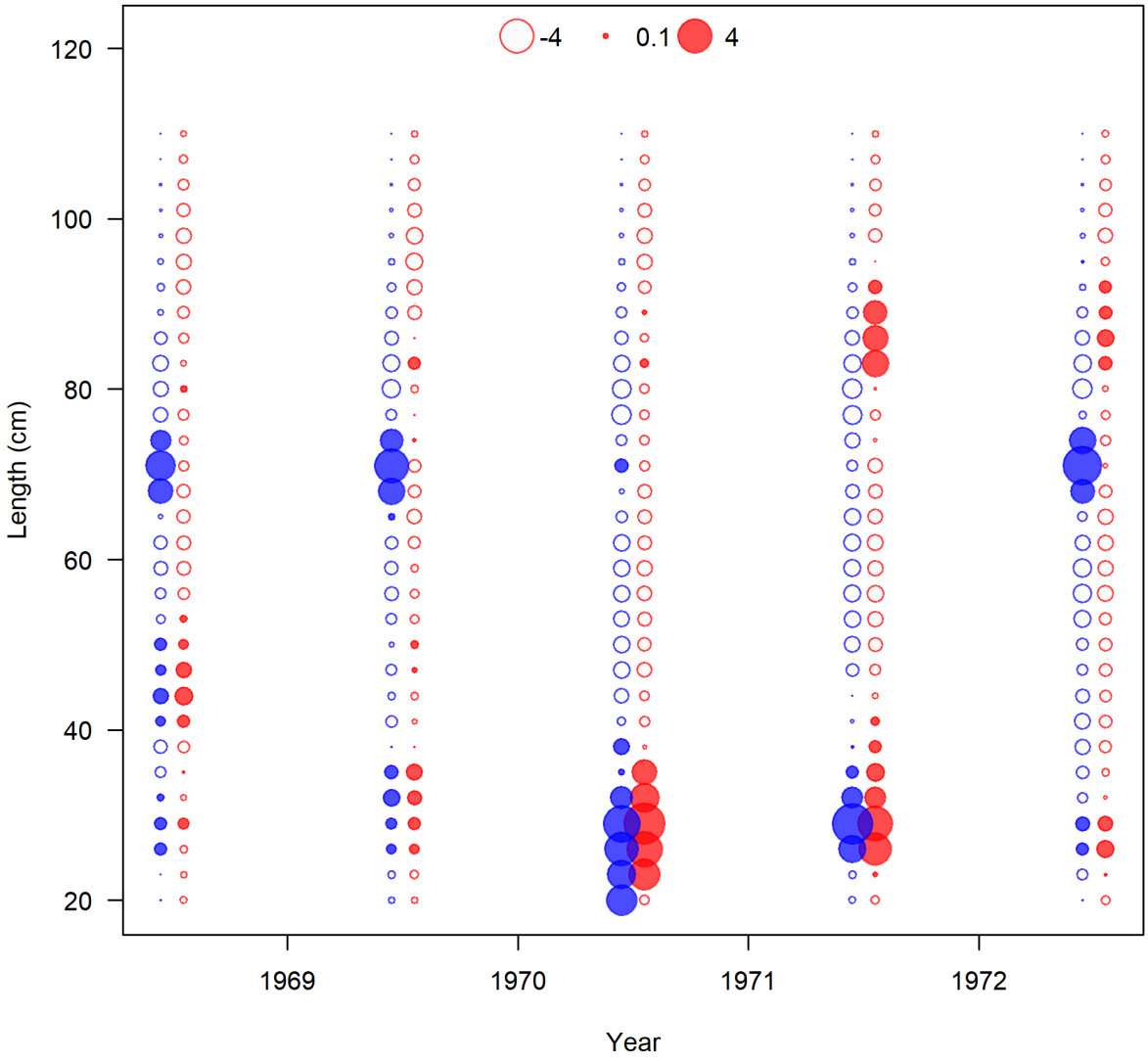

Figure 26: Pearson residuals for the fit to length compositions by year and sex for fleet 6: NEFSC_Spring_BTS_OFFSHORE_Y36. Closed bubbles are positive residuals (observed > expected) and open bubbles are negative residuals (observed < expected).

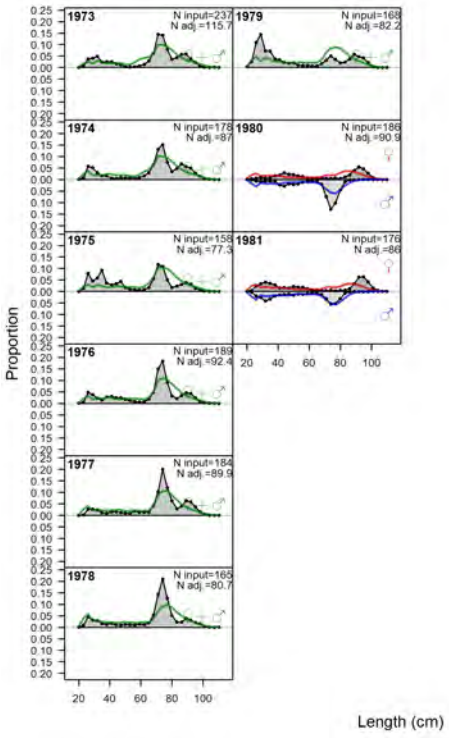

Figure 27: Fit to length compositions by year and sex for fleet 7: NEFSC_Spring_BTS_OFFSHORE_Y41.

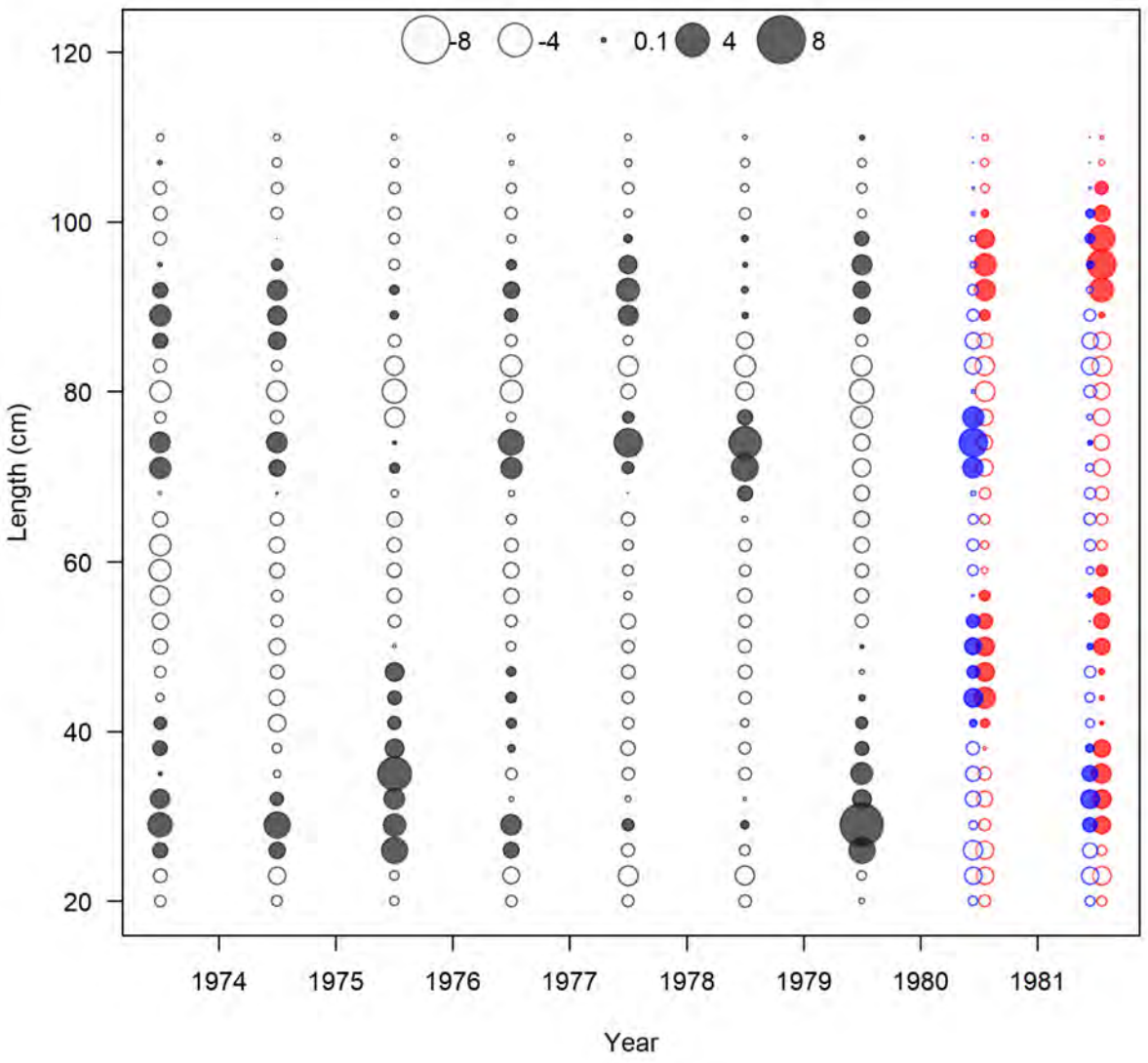

Figure 28: Pearson residuals for the fit to length compositions by year and sex for fleet 7: NEFSC_Spring_BTS_OFFSHORE_Y41. Closed bubbles are positive residuals (observed > expected) and open bubbles are negative residuals (observed < expected).

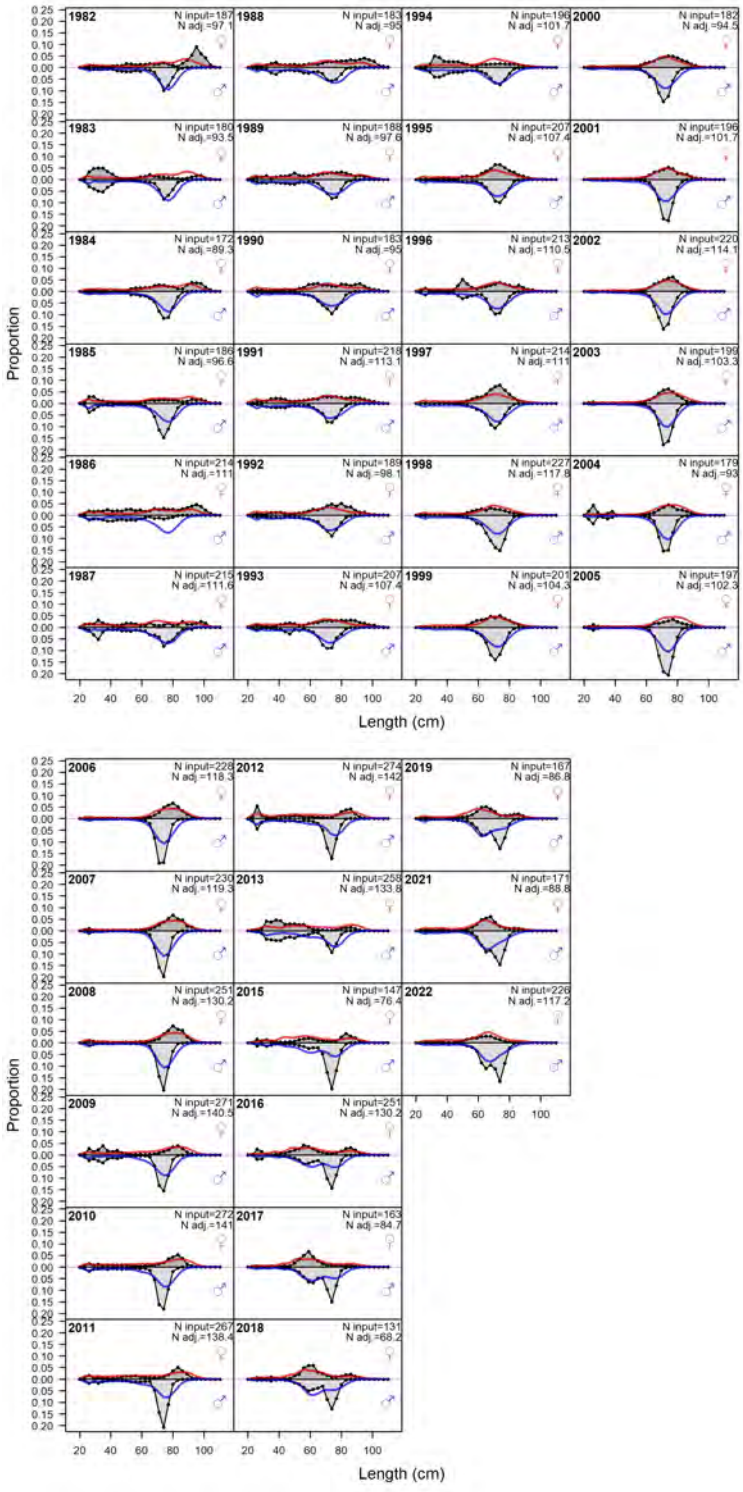

Figure 29: Fit to length compositions by year and sex for fleet 8: NEFSC_Spring_BTS.

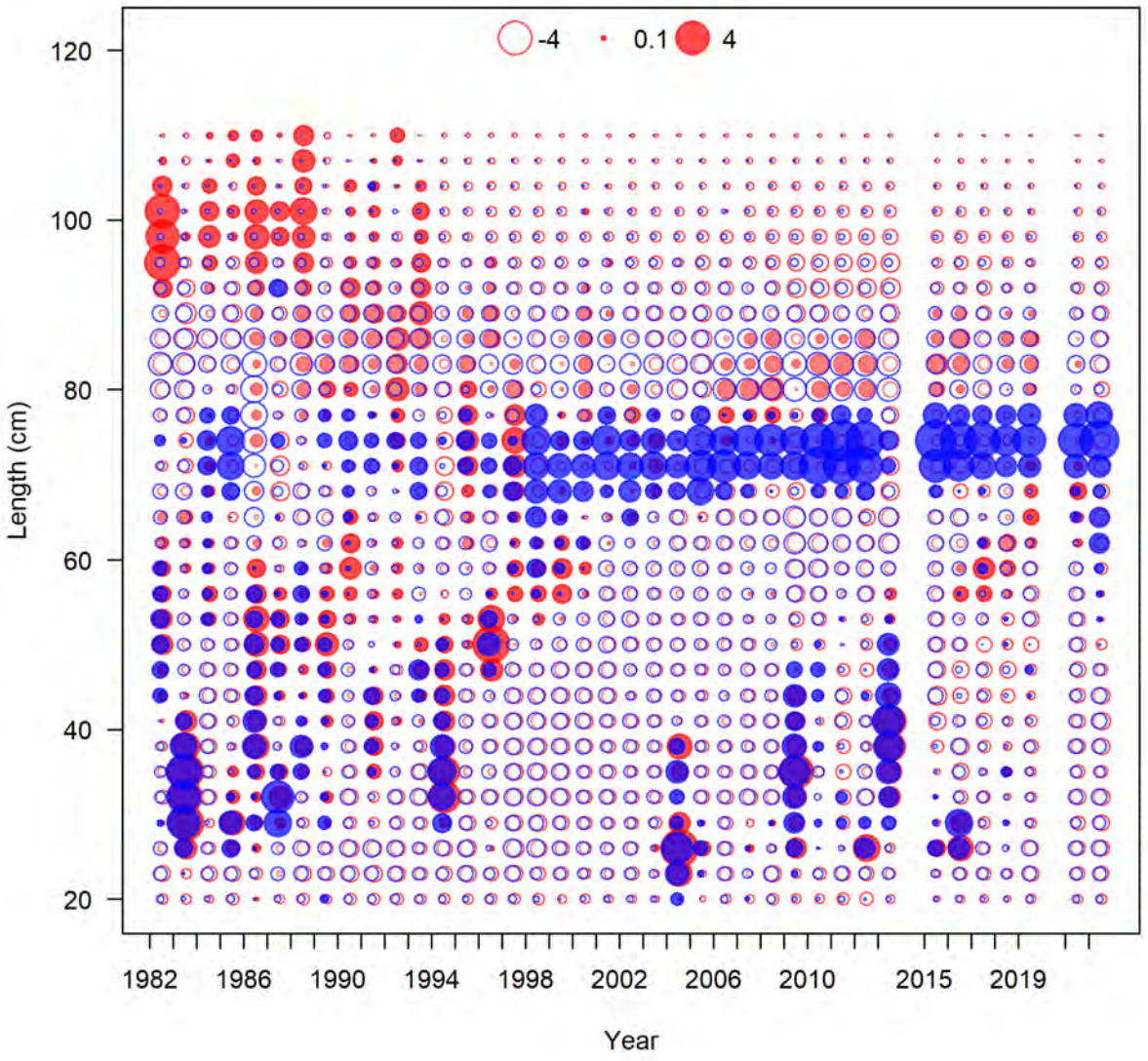

Figure 30: Pearson residuals for the fit to length compositions by year and sex for fleet 8: NEFSC_Spring_BTS. Closed bubbles are positive residuals (observed > expected) and open bubbles are negative residuals (observed < expected).

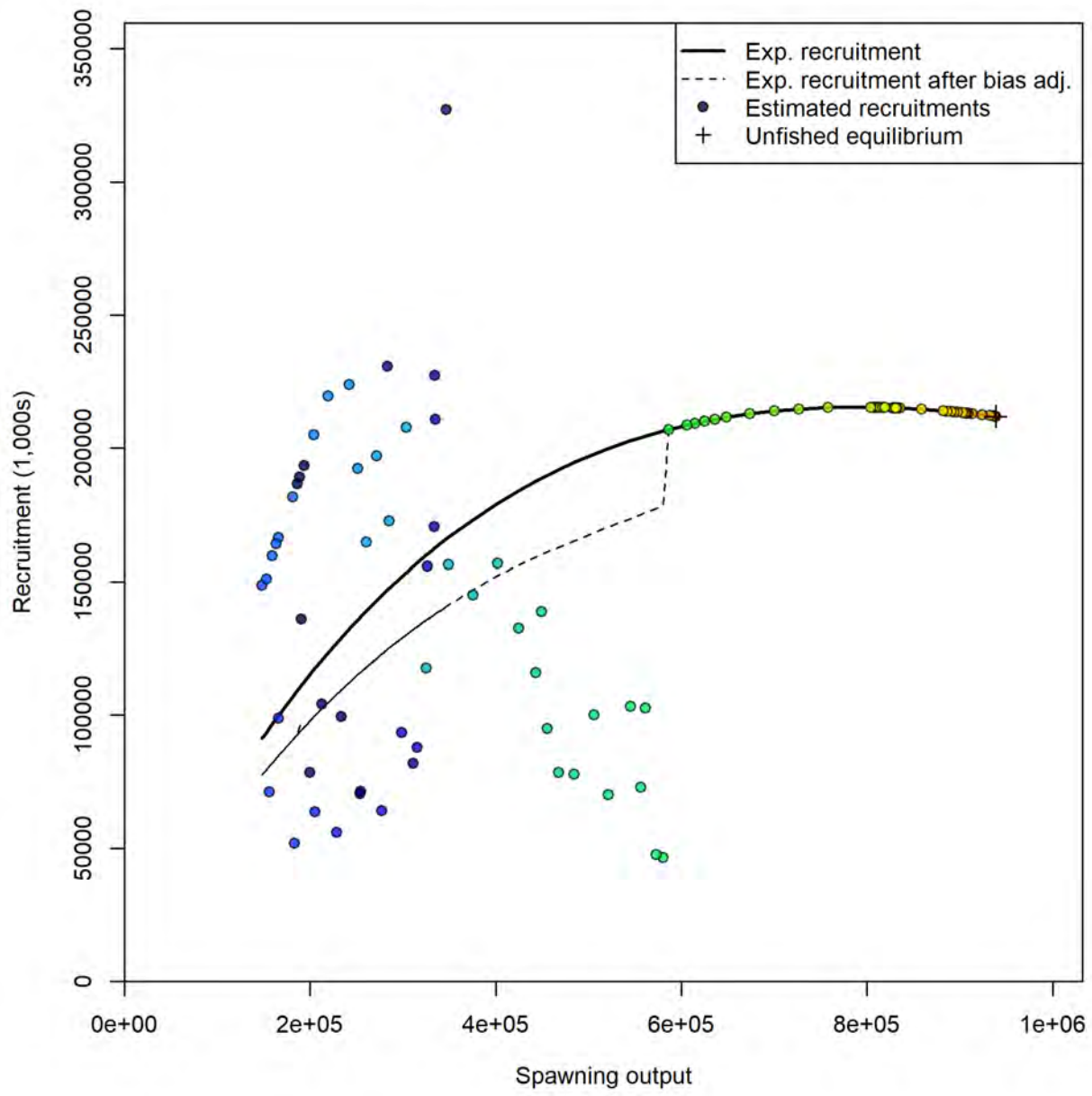

Figure 31: Fixed survivorship spawner-recruitment relationship, estimated age-0 recruitment (1,000s), and estimated spawning output (1,000s) for Atlantic spiny dogfish.

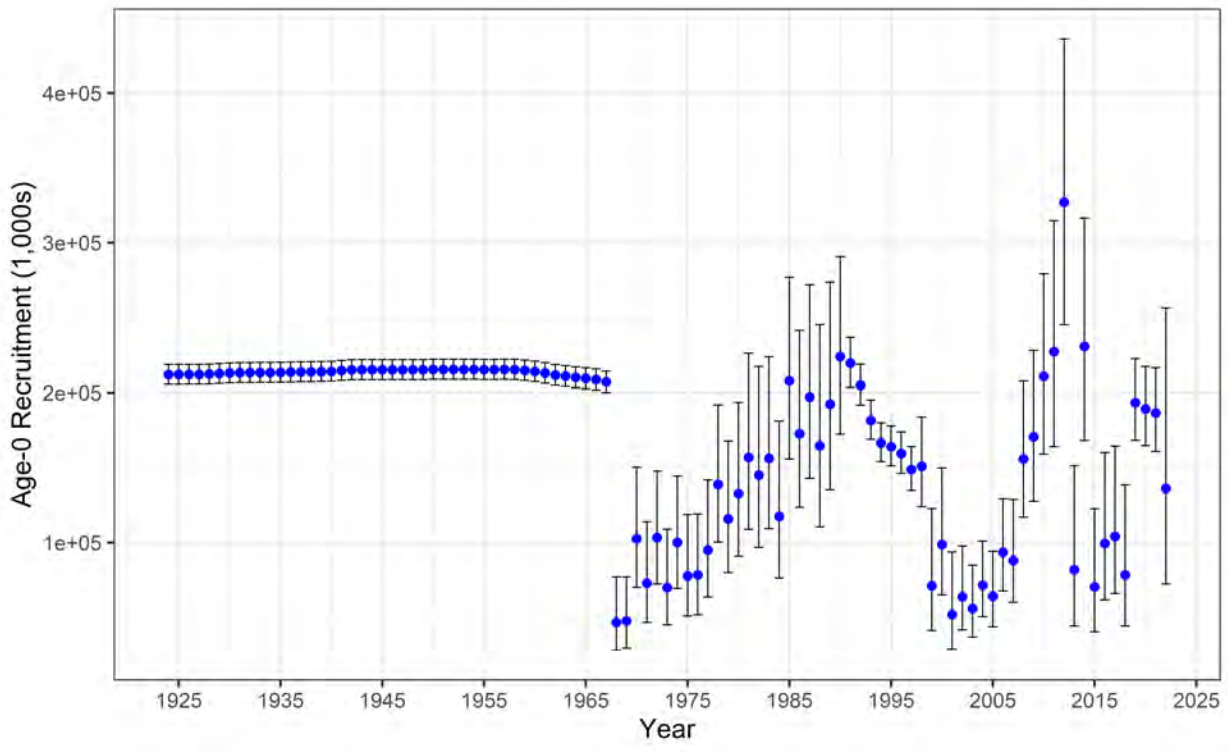

Figure 32: Estimated age-0 recruitment (1,000s) with $\sim$ 95% asymptotic intervals from 1924 to 2022 for Atlantic spiny dogfish.

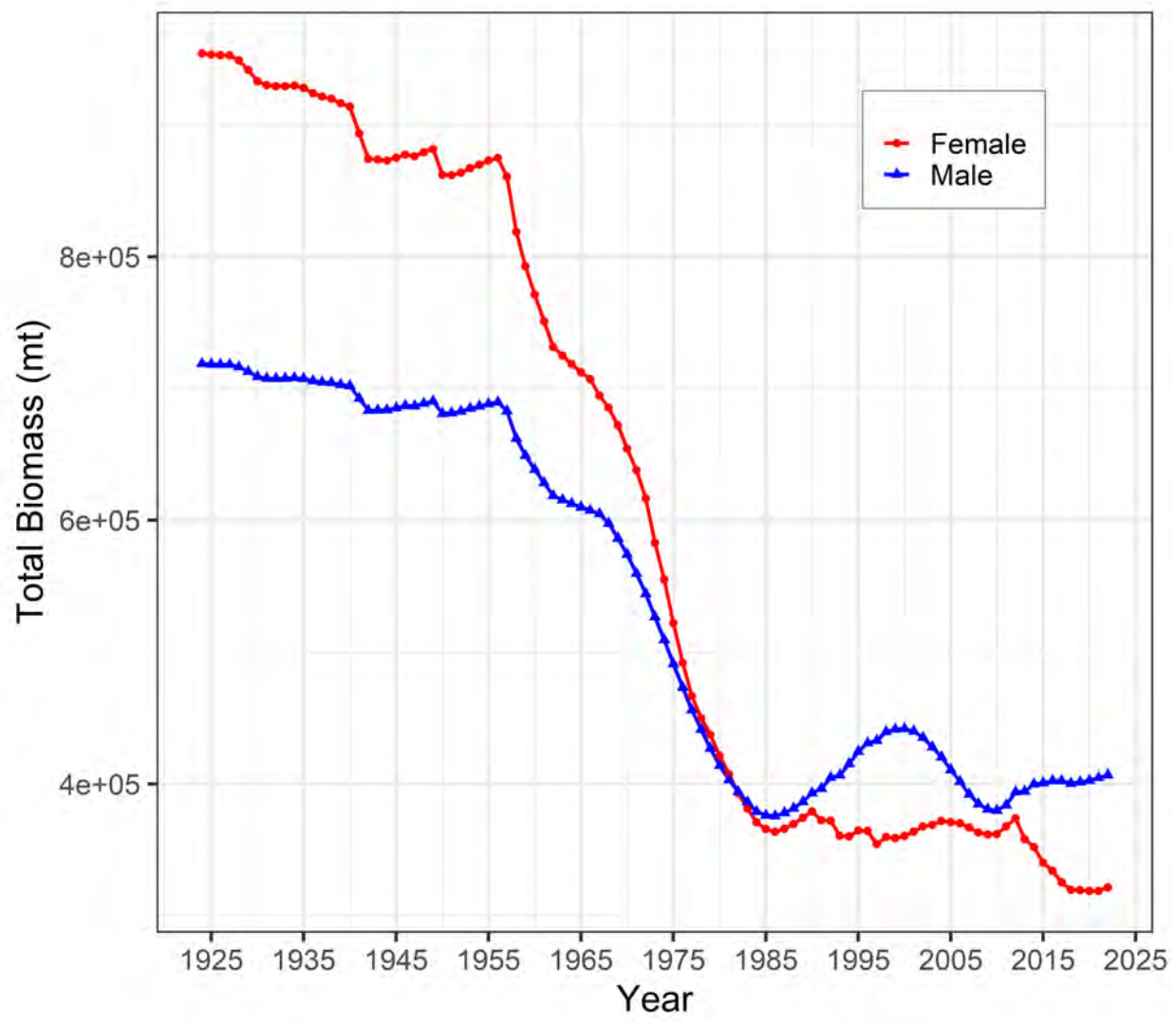

Figure 33: Estimated total biomass (mt) by sex from 1924 to 2022 for Atlantic spiny dogfish.

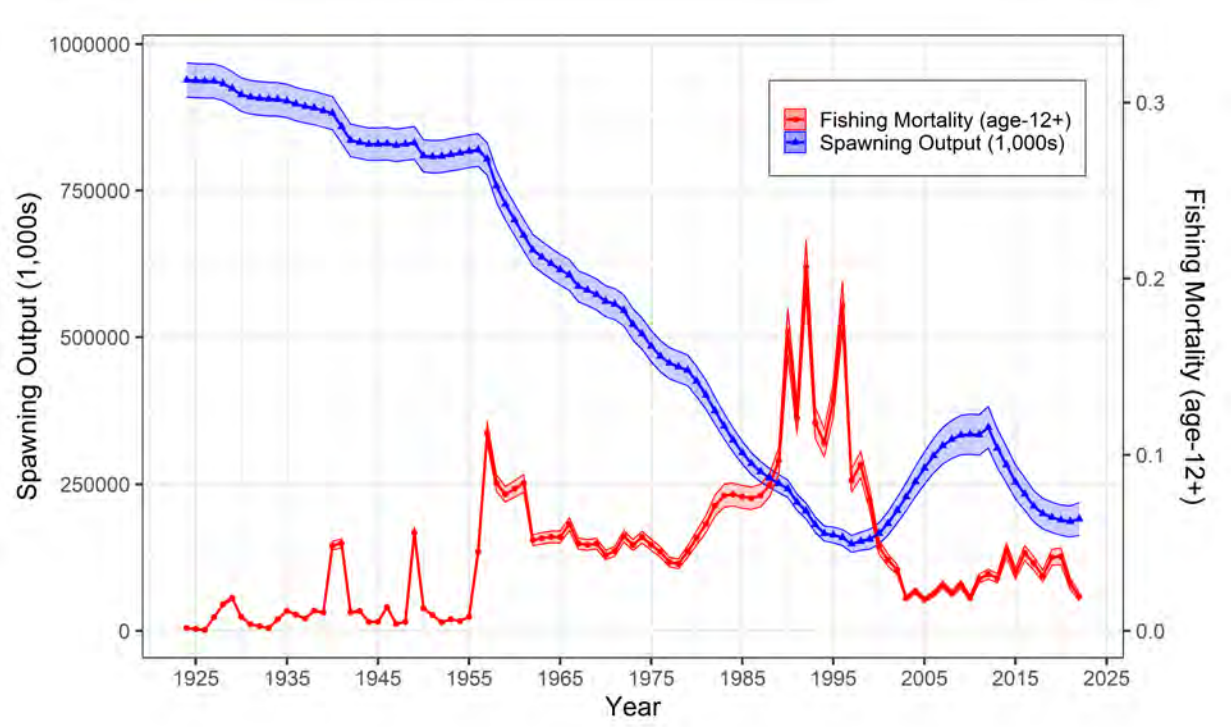

Figure 34: Estimated spawning output and fishing mortality (age-12+) with $\sim$ 95% asymptotic intervals from 1924 to 2022 for Atlantic spiny dogfish.

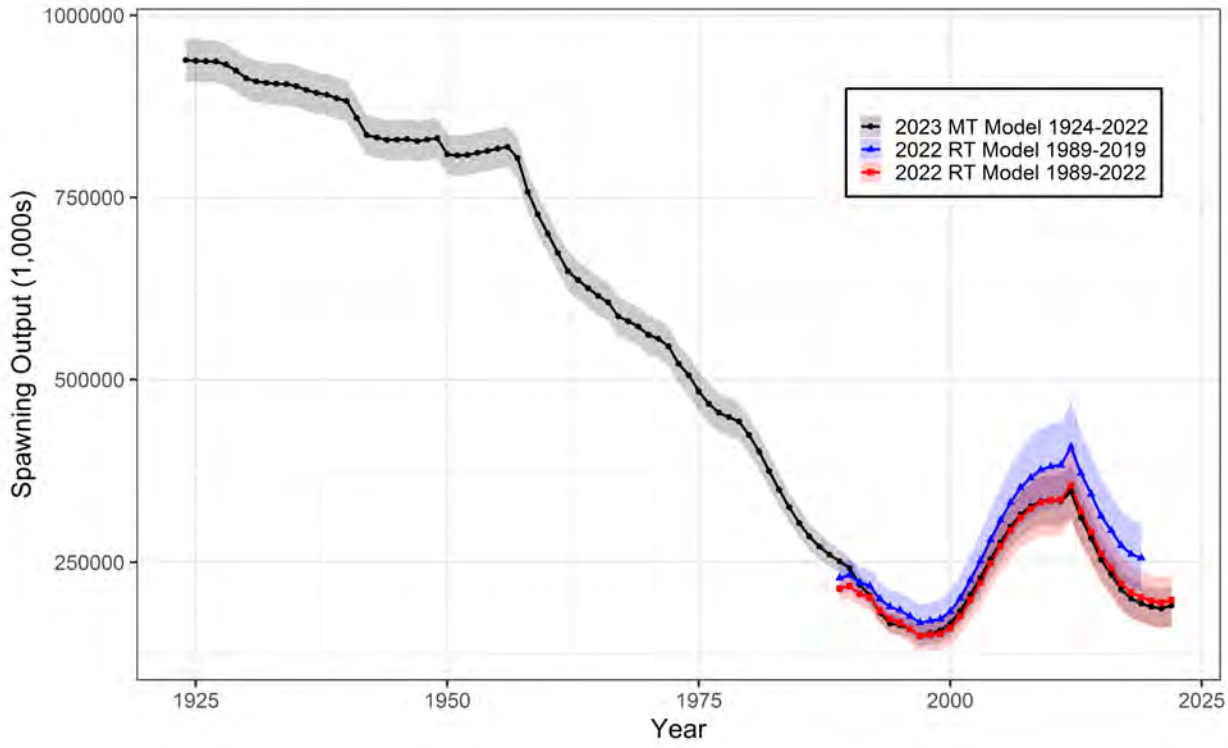

Figure 35: Spawning output (1,000s) with $\sim$ 95% asymptotic intervals estimated using the original 2022 research track model (1989-2019), updated 2022 research track model (1989-2022), and 2023 management track model (1924-2022).

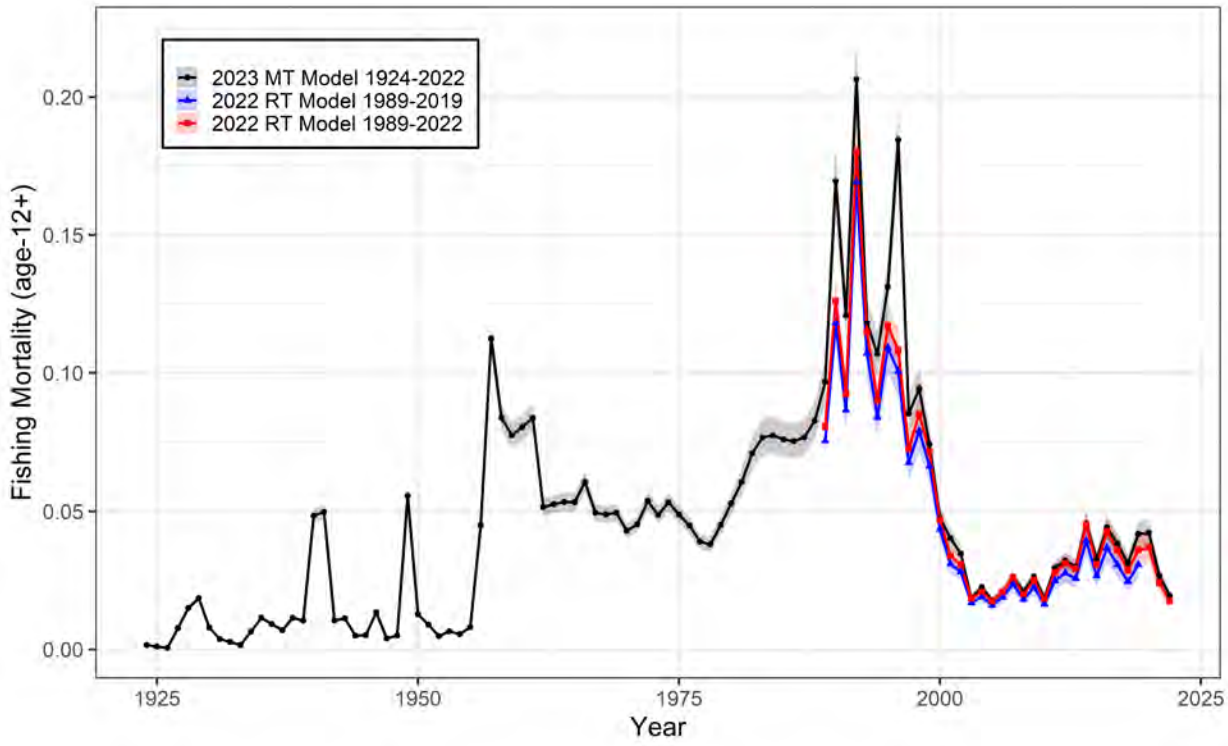

Figure 36: Fishing mortality (age-12+) with $\sim$ 95% asymptotic intervals estimated using the original 2022 research track model (1989-2019), updated 2022 research track model (1989-2022), and 2023 management track model (1924-2022).

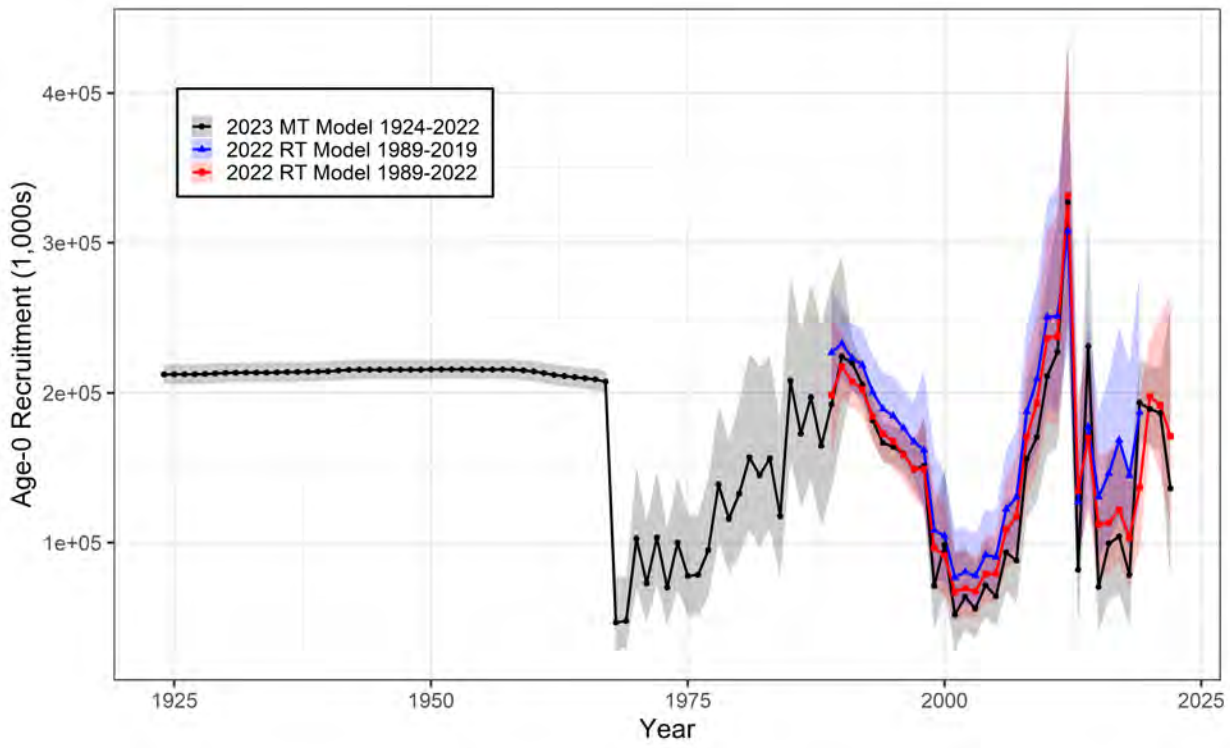

Figure 37: Age-0 recruitment (1,000s) with $\sim 95\%$ asymptotic intervals estimated using the original 2022 research track model (1989-2019), updated 2022 research track model (1989-2022), and 2023 management track model (1924-2022).

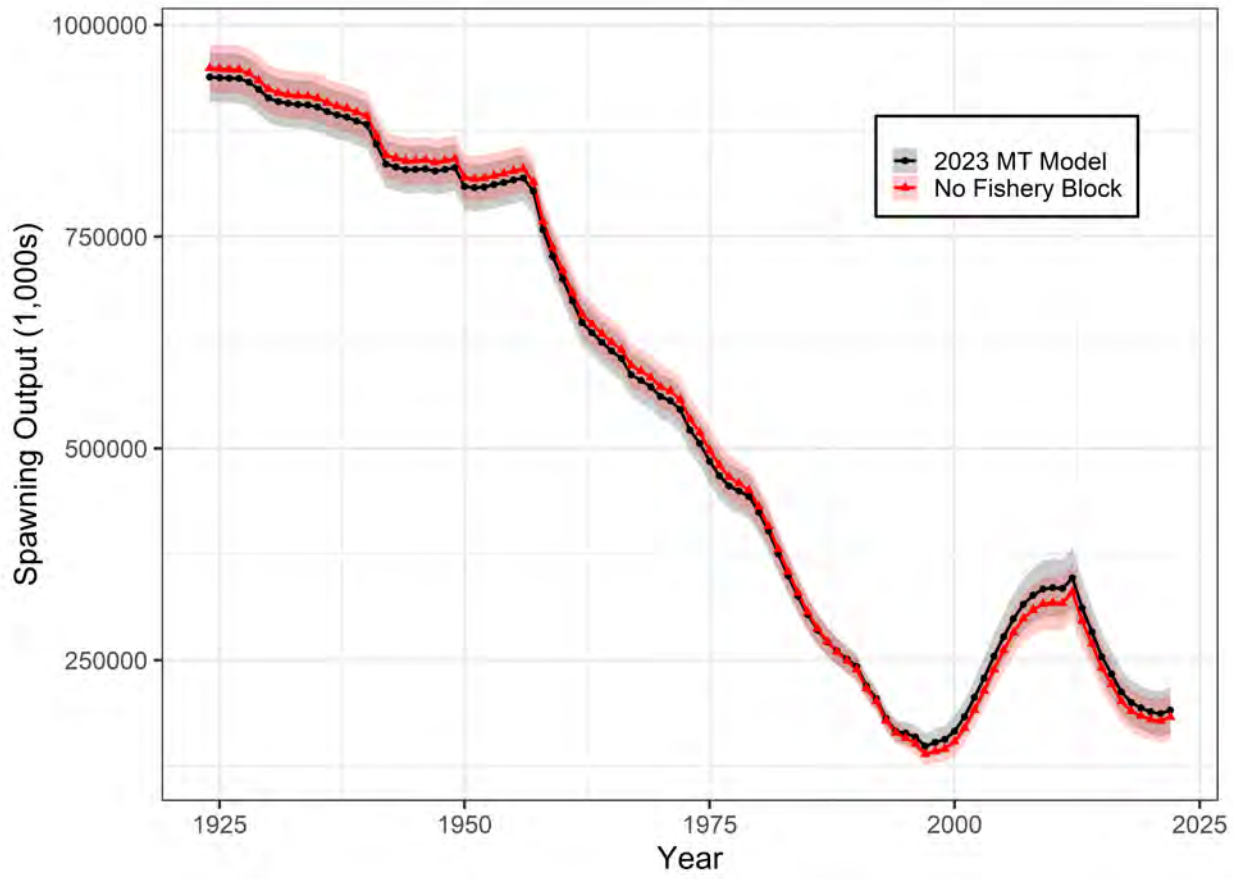

Figure 38: Spawning output (1,000s) with $\sim$ 95% asymptotic intervals estimated with and without the fishery block assumption.

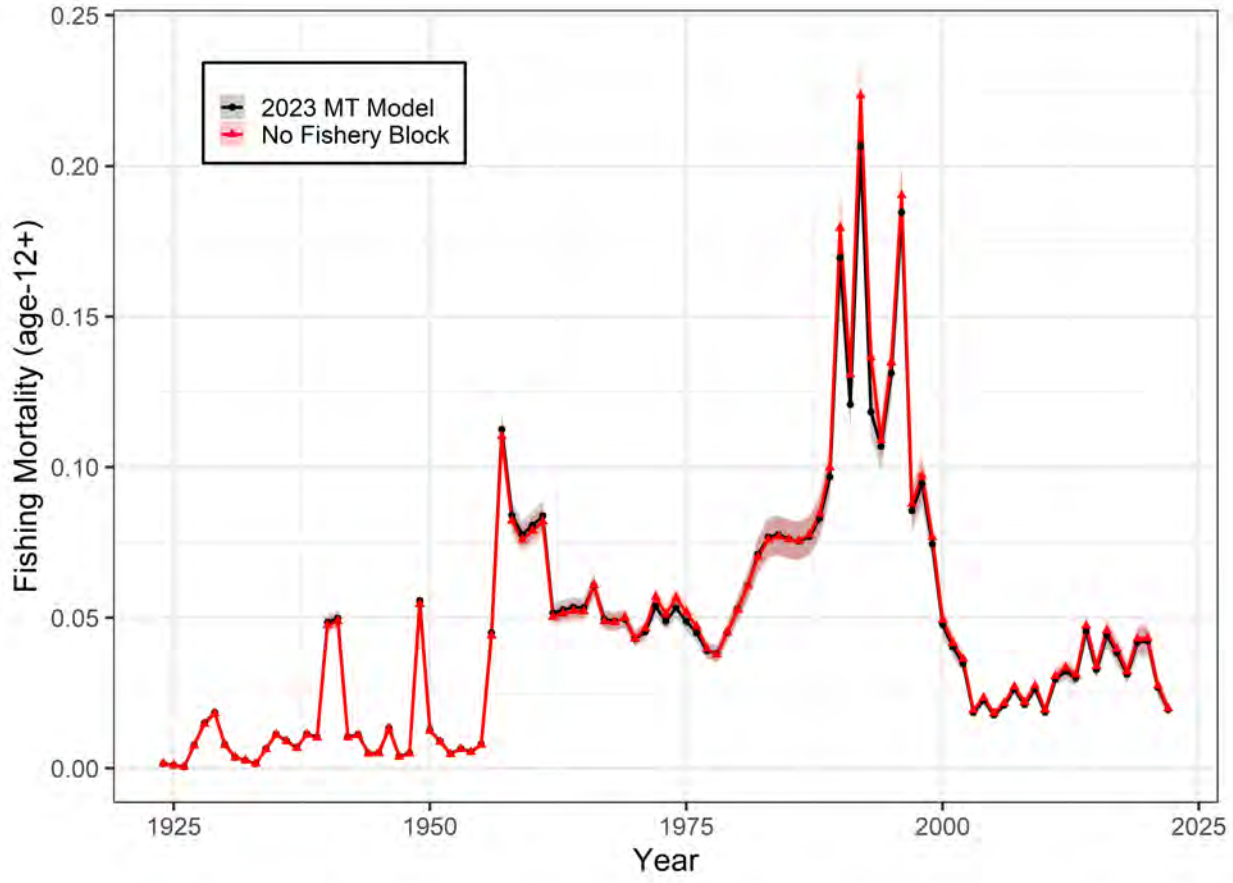

Figure 39: Fishing mortality (age-12+) with $\sim$ 95% asymptotic intervals estimated with and without the fishery block assumption.

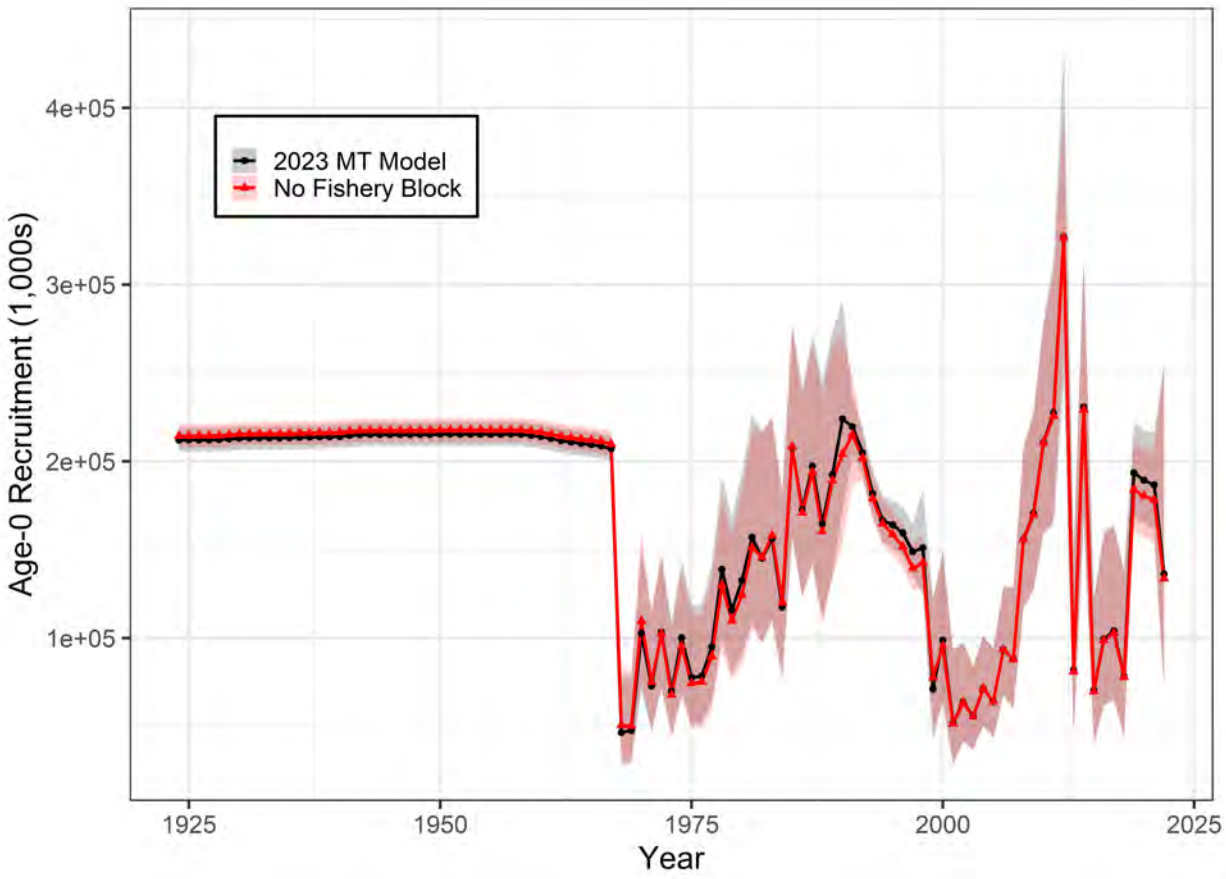

Figure 40: Age-0 recruitment (1,000s) with $\sim$ 95% asymptotic intervals estimated with and without the fishery block assumption.

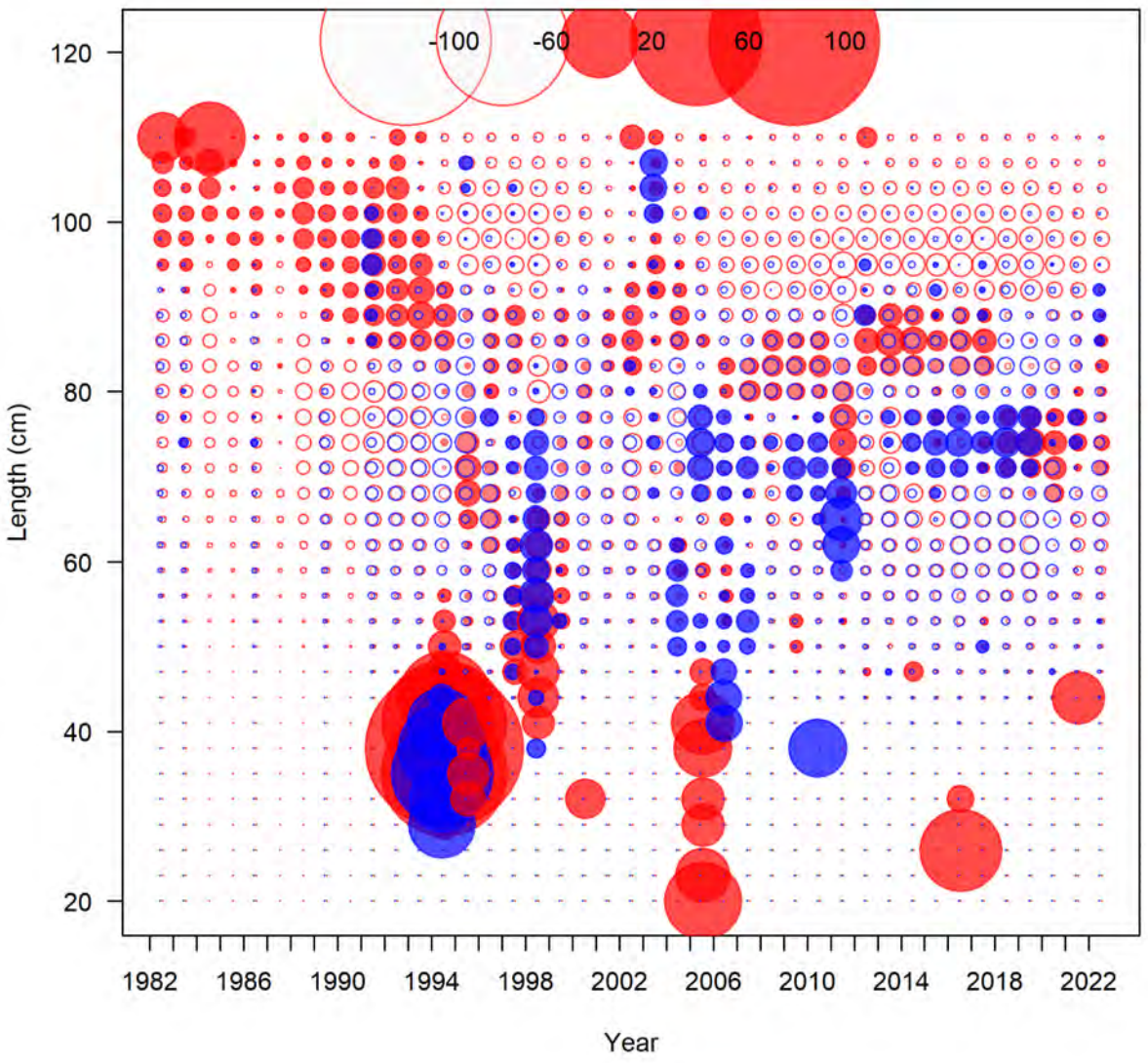

Figure 41: Pearson residuals for the fit to length compositions by year and sex for fleet 1: Landings_SGN_Rec_Others using the model without assuming a fishery block. Closed bubbles are positive residuals (observed > expected) and open bubbles are negative residuals (observed < expected).

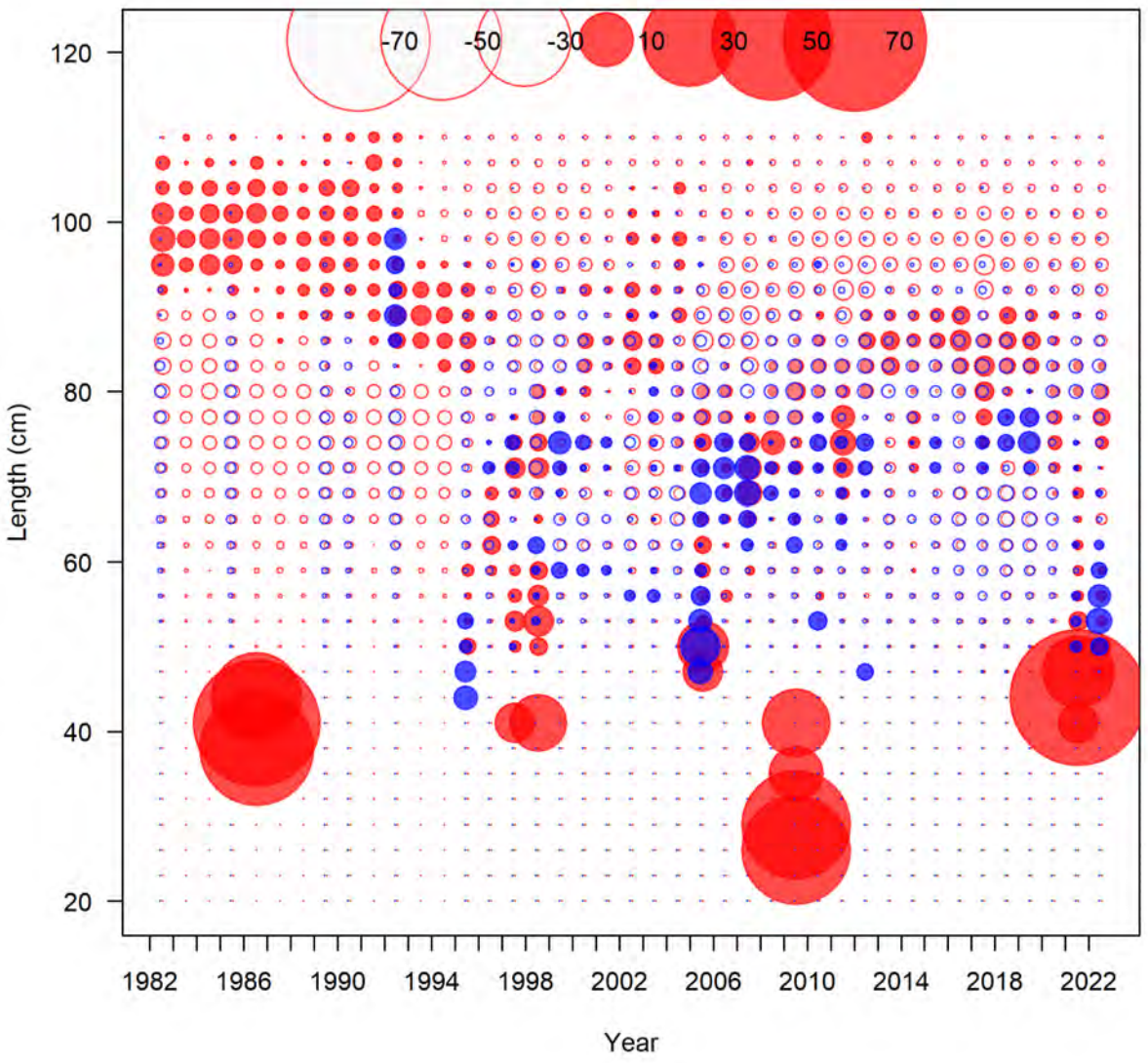

Figure 42: Pearson residuals for the fit to length compositions by year and sex for fleet 2: Landings_LL_OT_Foreign using the model without assuming a fishery block. Closed bubbles are positive residuals (observed > expected) and open bubbles are negative residuals (observed < expected).

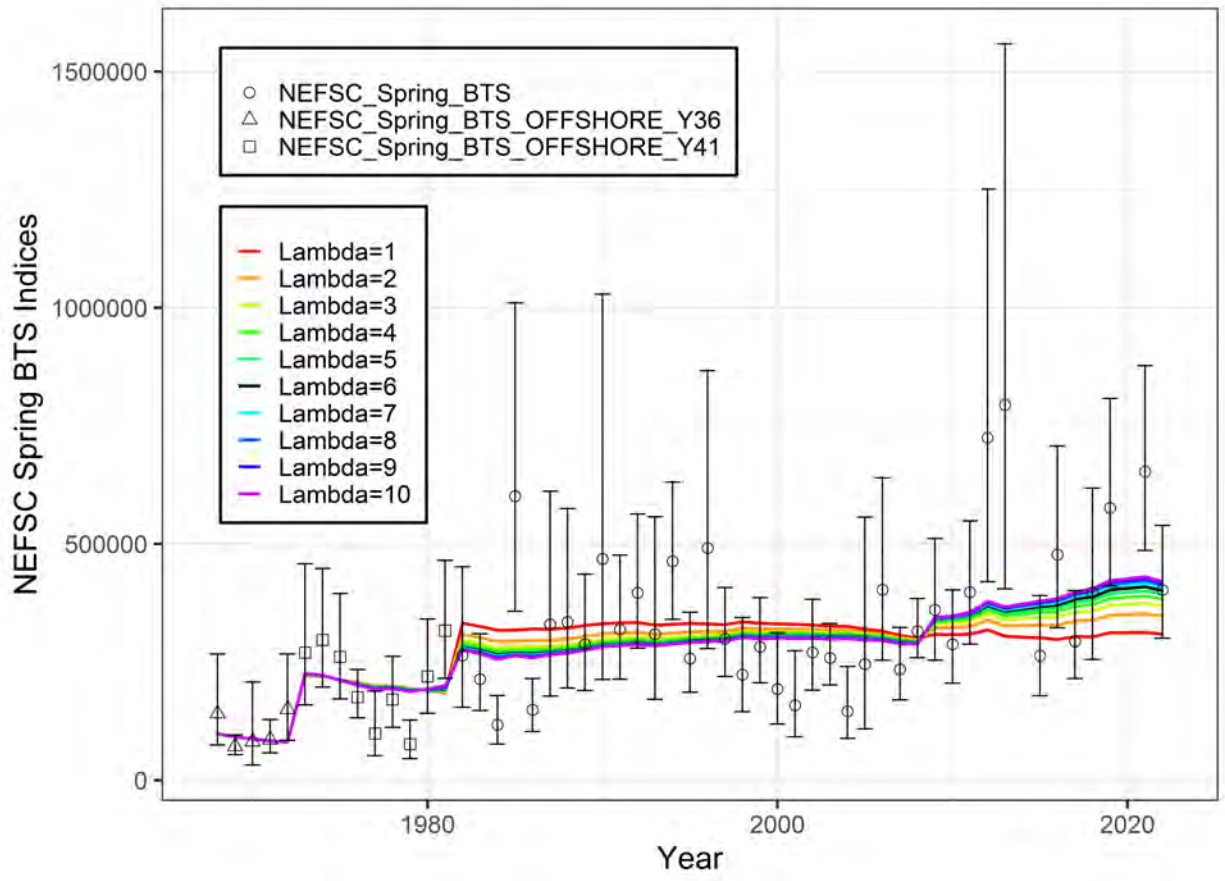

Figure 43: Survey indices with $\sim$ 95% asymptotic intervals for fleets 6-8 estimated with different likelihood weights for survey indices.

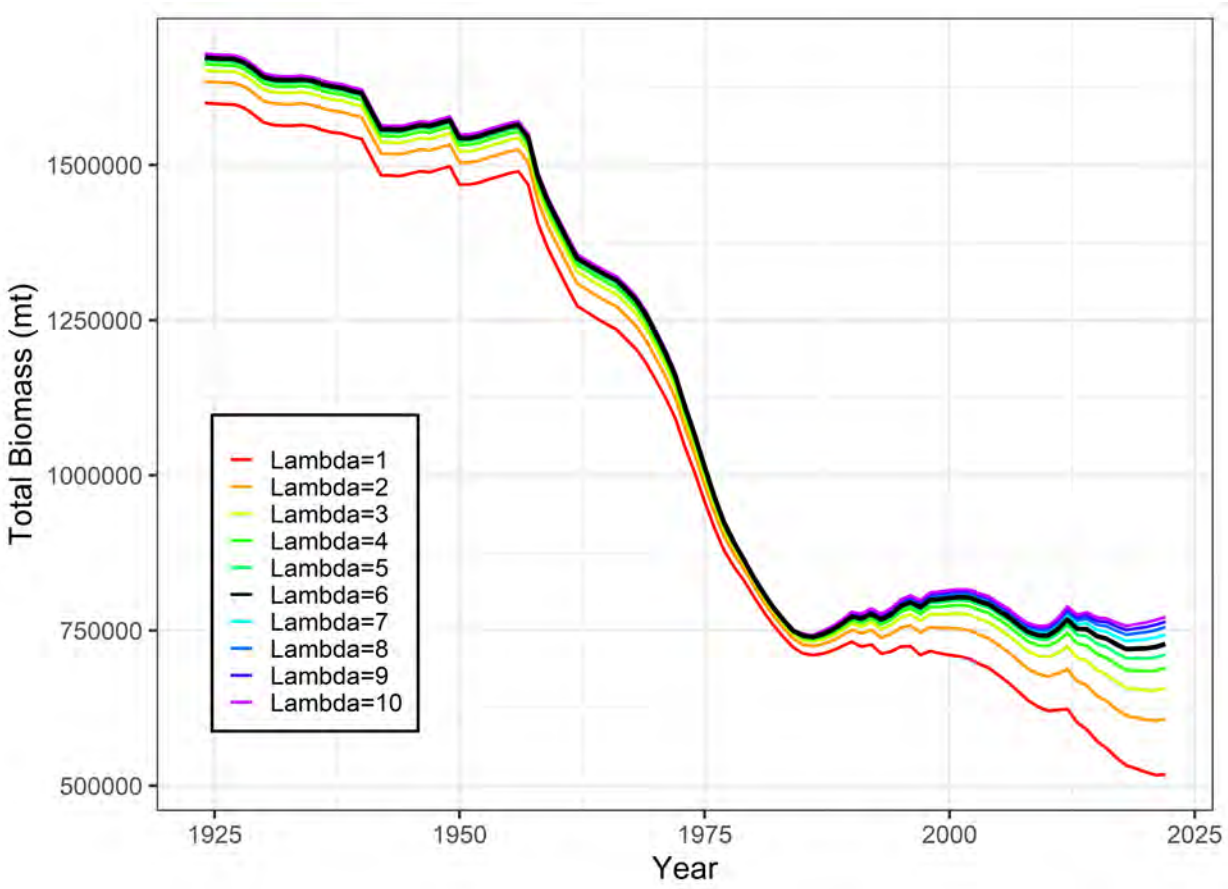

Figure 44: Total biomass (mt) estimated with different likelihood weights for survey indices.

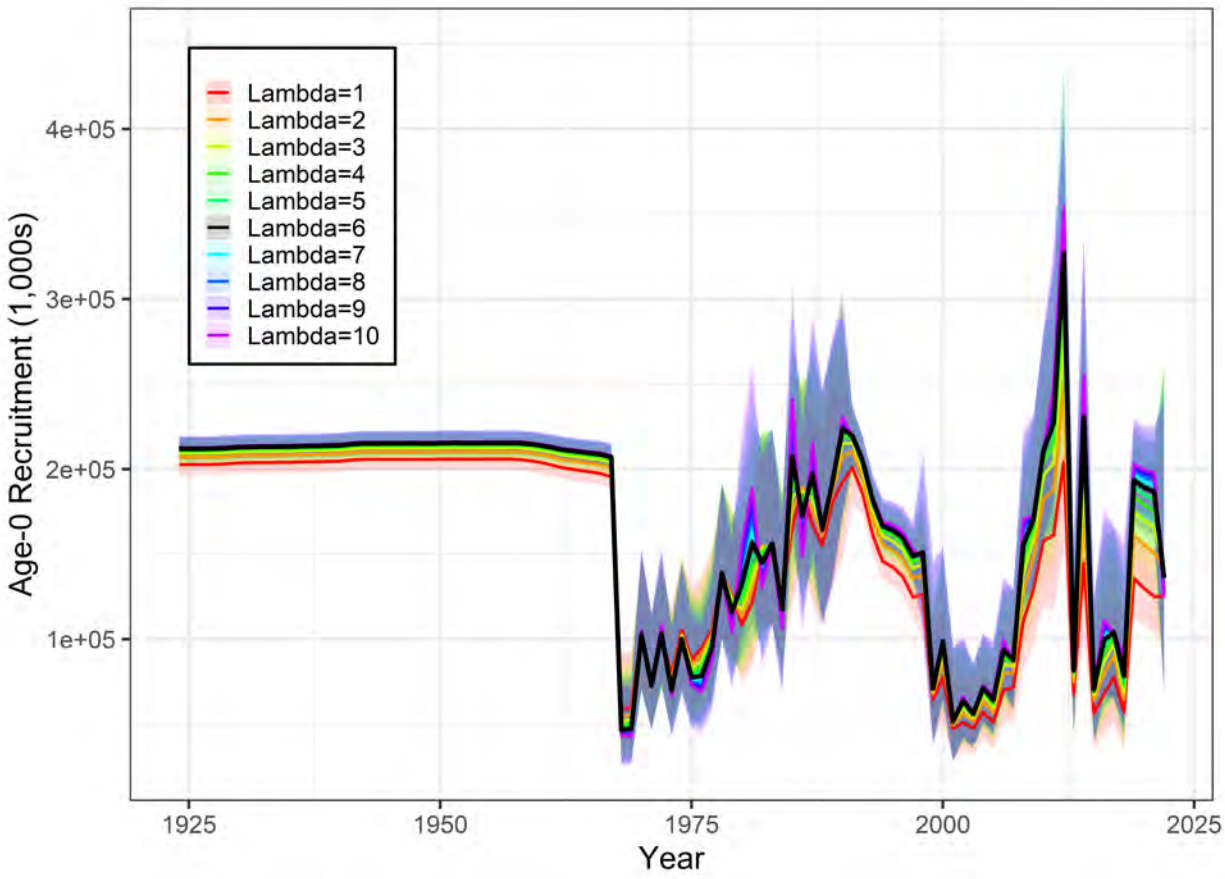

Figure 45: Age-0 recruitment (1,000s) with $\sim$ 95% asymptotic intervals estimated with different likelihood weights for survey indices.

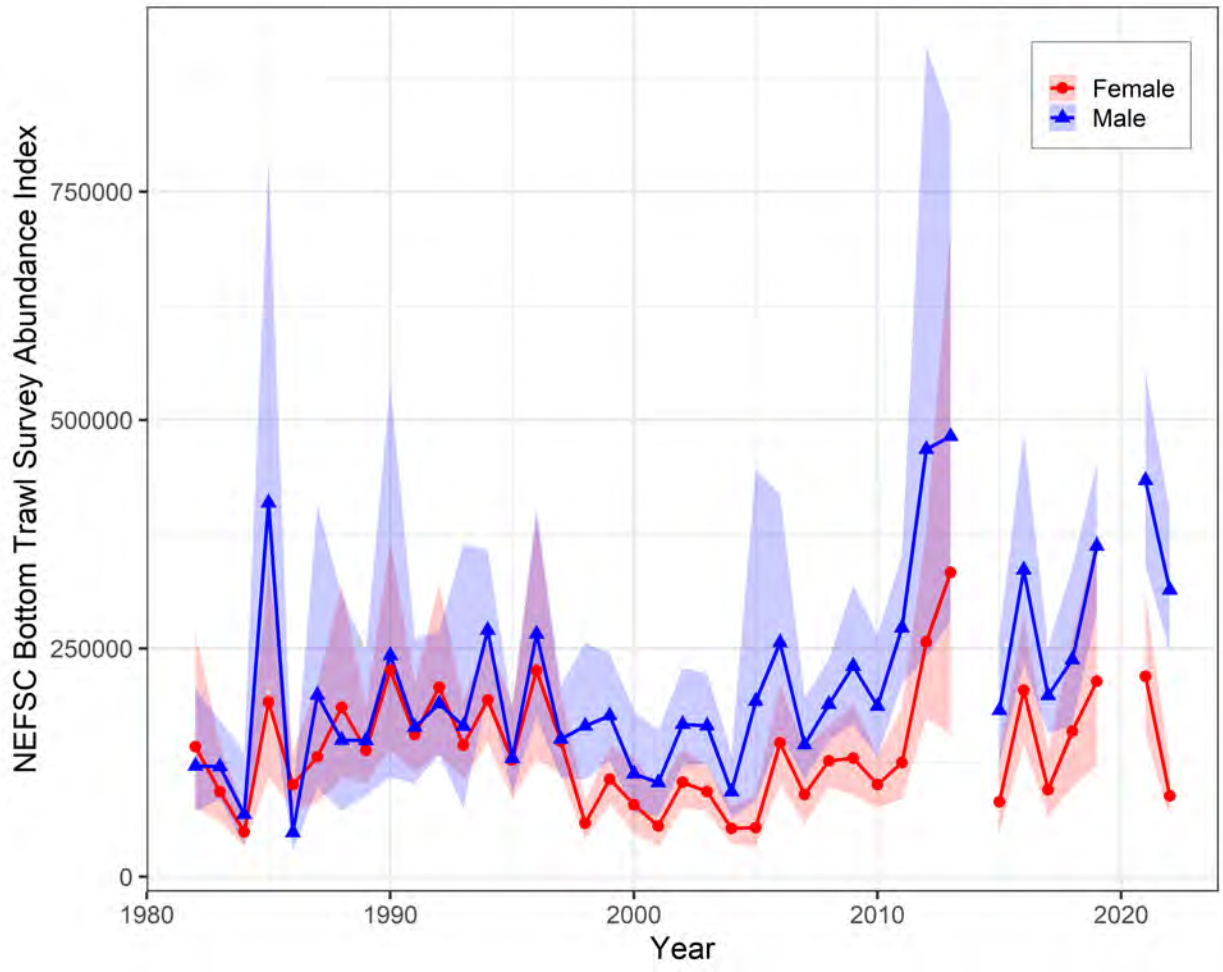

Figure 46: NEFSC spring bottom trawl survey abundance index with $\sim$ 95% asymptotic intervals by sex for fleet 8.

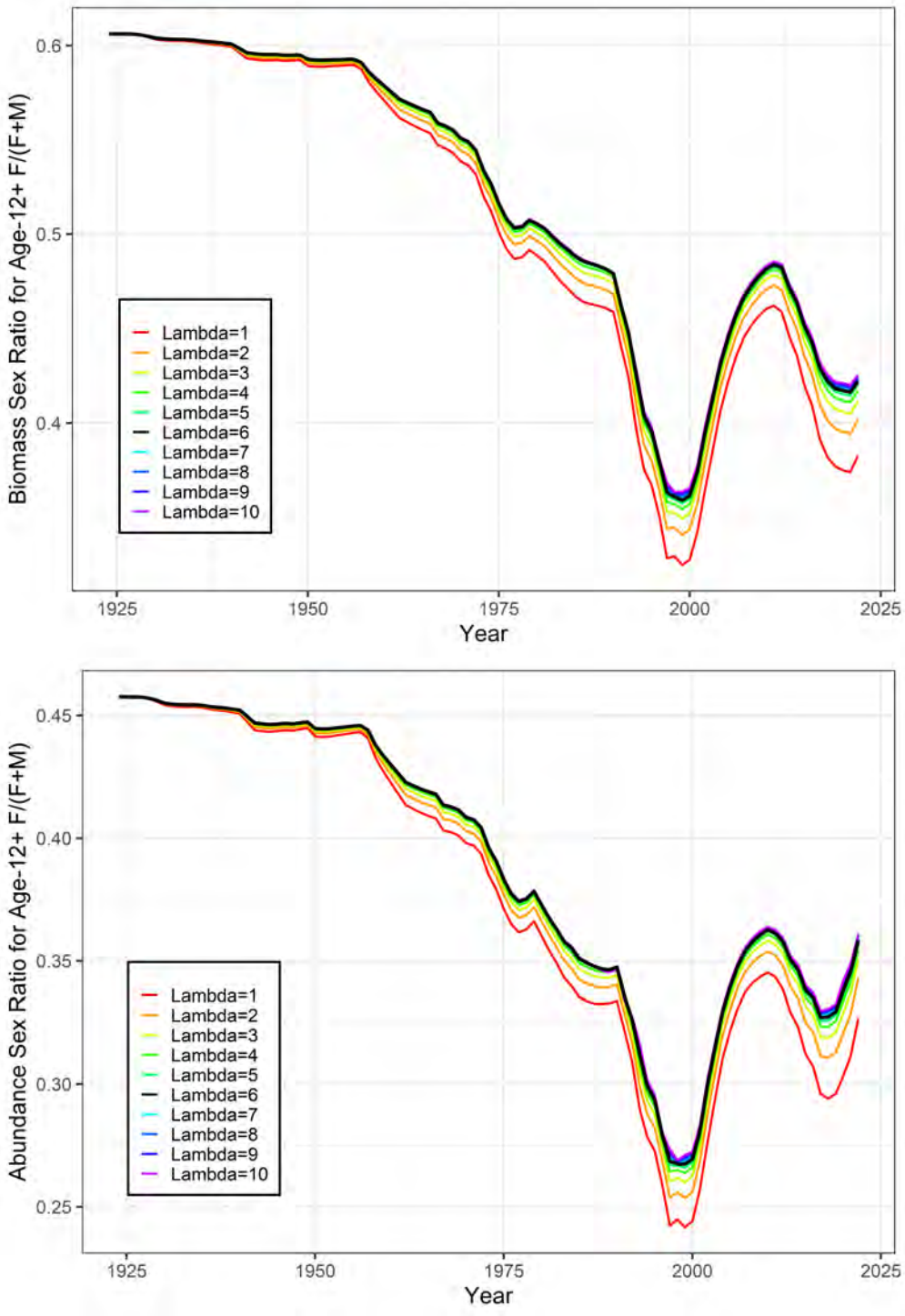

Figure 47: Female sex ratio (female/total) calculated using the estimated age-12+ numbers (top) and biomass (bottom) by likelihood weights for survey indices.

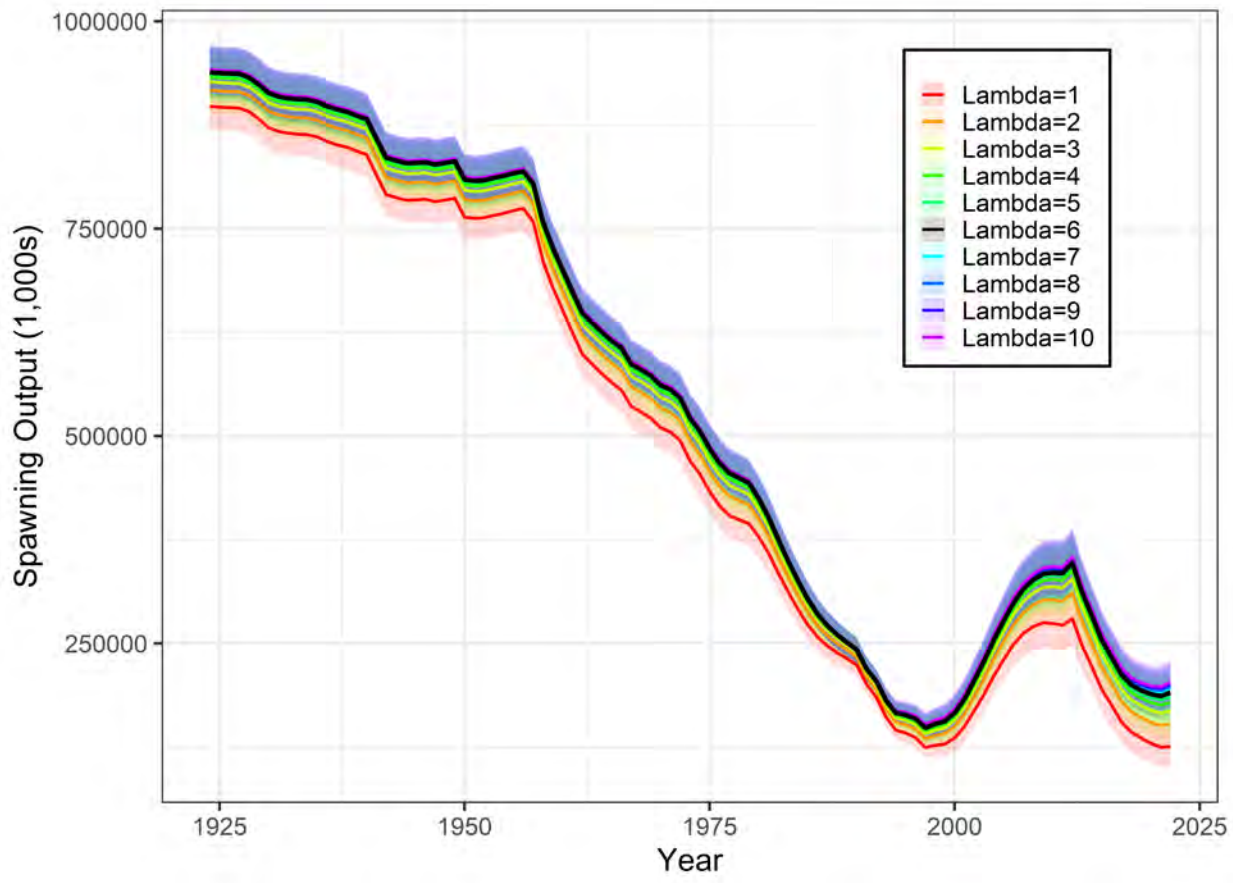

Figure 48: Spawning output (1,000s) with $\sim$ 95% asymptotic intervals estimated with different likelihood weights for survey indices.

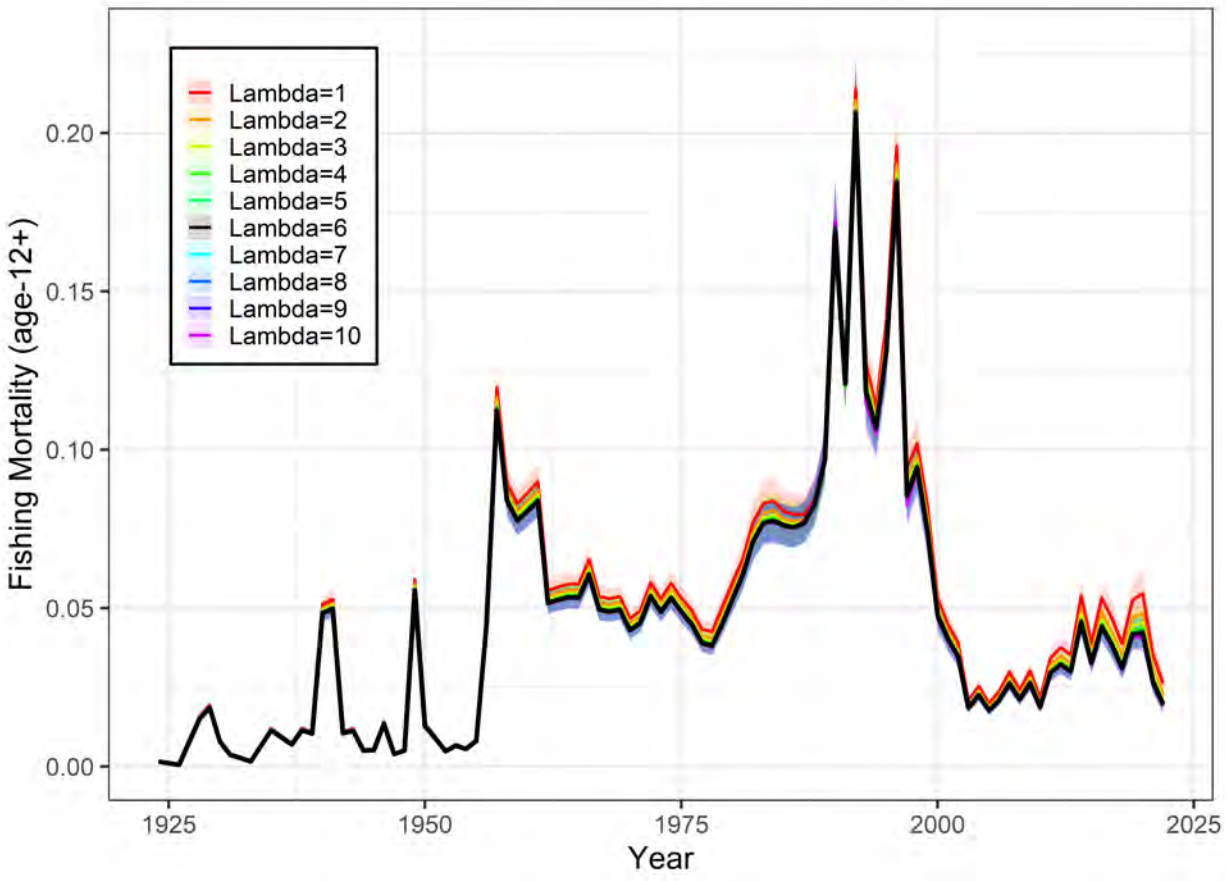

Figure 49: Fishing mortality (age-12+) with $\sim$ 95% asymptotic intervals estimated with different likelihood weights for survey indices.

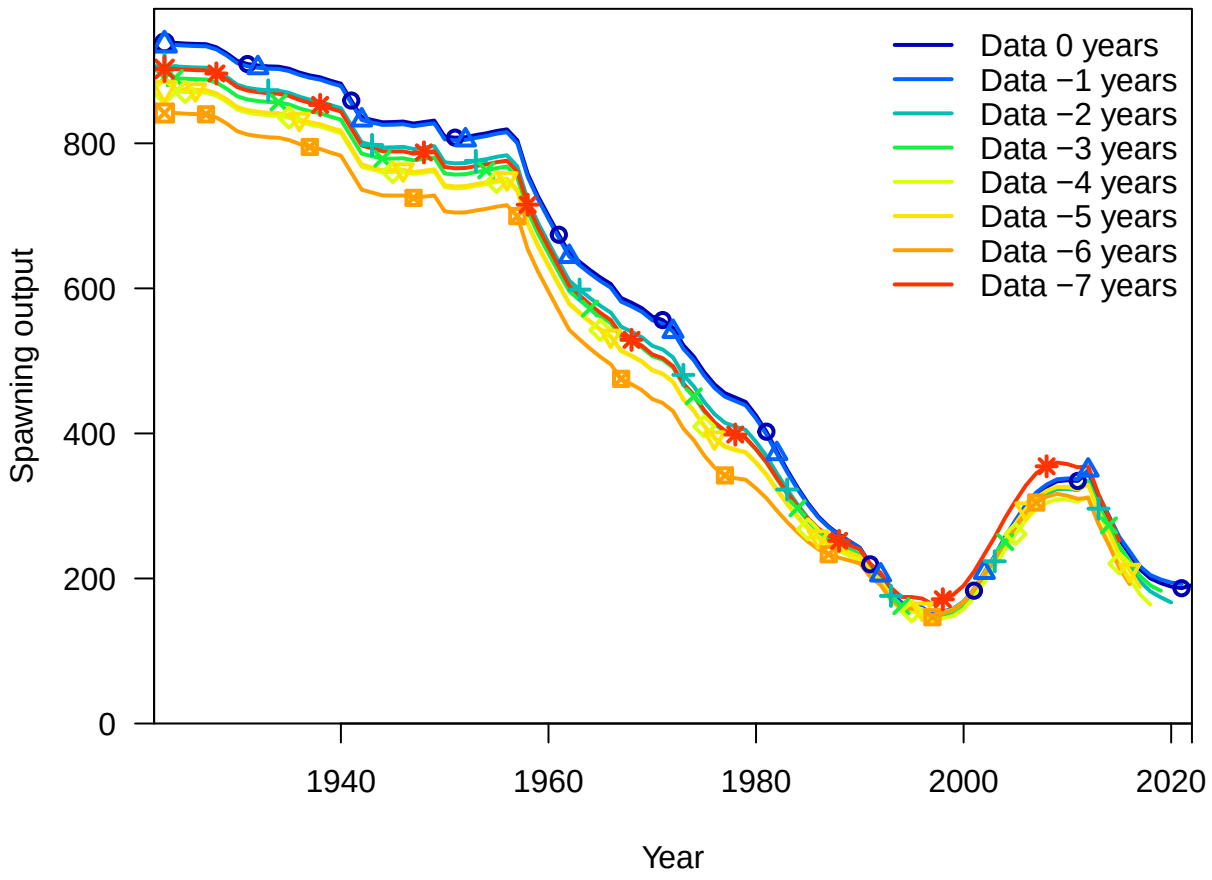

Figure 50: Retrospective plot for spawning output (1,000s).

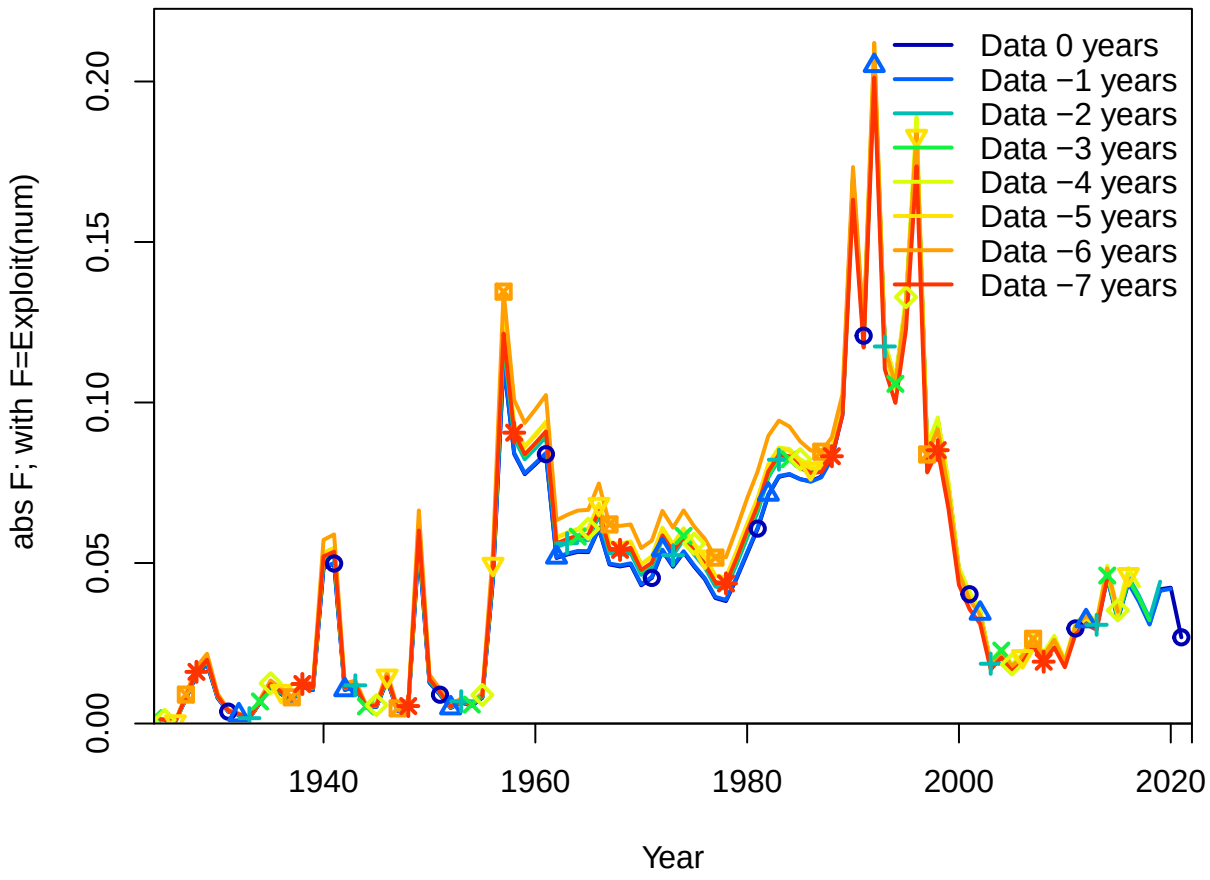

Figure 51: Retrospective plot for fishing mortality (age-12+).

December 2023 Council Meeting Summary

The Mid-Atlantic Fishery Management Council met December 12-14, 2023, in Philadelphia, PA. Presentations, briefing materials, motions, and webinar recordings are available at http://www.mafmc.org/briefing/december-2023.

HIGHLIGHTS

During this meeting, the Council:

- Reviewed analysis of several summer flounder commercial mesh regulations and agreed to develop a framework/addendum to further consider potential changes to the Small Mesh Exemption Program and the flynet exemption*
- Approved the use of regional conservation equivalency to achieve the required 28% reduction in recreational harvest of summer flounder in 2024-2025*
- Agreed that the states will work through the Commission process to achieve the required 10% reduction in the recreational harvest of scup in 2024-2025*
- Recommended removing the previously-adopted closure of the recreational scup fishery in federal waters from January 1-April 30 (resulting in a year-round open season in federal waters)*
- Approved status quo recreational black sea bass measures for 2024*
- Modified the preliminary range of alternatives for the Summer Flounder, Scup, Black Sea Bass, and Bluefish Recreational Measures Setting Process Framework/Addenda
- Approved a Guidance Document for Council review of Exempted Fishing Permit (EFP) applications for species designated as Ecosystem Components through the Unmanaged Forage Amendment
- Adopted spiny dogfish specifications 2024-2026, including a 10.7-million-pound commercial quota for 2024
- Adopted Atlantic mackerel specifications for 2024-2025, including a 1.9-million-pound commercial quota for both years
- Reviewed the golden tilefish Individual Fishing Quota program review and initiated a 30-day public comment period
- Approved the 2024 Implementation Plan
- Received a presentation from the Responsible Offshore Science Alliance (ROSA)

** Items denoted with an asterisk (*) were undertaken during joint meetings with the Atlantic States Marine Fisheries Commission's Summer Flounder, Scup, Black Sea Bass Management Board or Interstate Fisheries Management Program Policy Board*

Summer Flounder Commercial Mesh Size Regulations and Exemptions

The Council met jointly with the Atlantic States Marine Fisheries Commission's Summer Flounder, Scup, and Black Sea Bass Management Board (Board) to review analysis of, and public input on, several summer flounder commercial mesh regulations, including: 1) the current 5.5-inch diamond and 6.0-inch square minimum mesh size, 2) the summer flounder Small Mesh Exemption Program (SMEP), and 3) the summer flounder flynet exemption.

The Council and Board recommended no change to the current summer flounder minimum mesh sizes, due to the lack of sufficient evidence to suggest a change is warranted. They agreed that additional selectivity studies should

be considered as a research priority, including exploring the selectivity of a wider range of square mesh sizes and further comparing selectivity between square and diamond mesh.

The Council and Board also recommended development of a framework/addendum to further consider potential changes to the two mesh exemptions as a priority in 2024. Specifically, this action would consider revisions to the definition of a flynet as well as modifications to the western boundary of the small-mesh exemption area. The changes are intended to be implemented by November 1, 2024, if possible.

Summer Flounder, Scup, and Black Sea Bass Recreational Management Measures

The Council and Board also adopted recreational management measures (i.e., bag, size, and season limits) for summer flounder, scup, and black sea bass. This was the second year of setting measures under the Percent Change Approach, and the first year of setting measures for two-year cycles for summer flounder and scup. Black sea bass measures were set for 2024 only due to the timing of the management track assessment.

The Percent Change Approach uses a comparison of the RHL to an estimate of expected harvest, in addition to stock size, to determine if measures should be restricted, liberalized, or remain unchanged for the next two years.

Prior to their deliberations for each species, the Council and Board received a brief overview of the Recreation Demand Model (RDM). The RDM was developed by the Northeast Fisheries Science Center (NEFSC) to predict the effect of proposed recreational measures on angler satisfaction, fishing effort, recreational harvest, and recreational discards of summer flounder, scup, and black sea bass. The RDM was first used in setting 2023 measures and will be used again for the upcoming years.

2024-2025 Summer Flounder Recreational Measures

The Percent Change Approach requires a 28% reduction in recreational harvest of summer flounder in 2024-2025. This reduction is needed because the RHL for 2024-2025 (6.35 million pounds) falls below the confidence interval around projected harvest for these years, and the stock size is below the target level. Measures will be restricted to achieve the full 28% reduction in 2024 and then will remain unchanged in 2025 unless new information suggests a major change in the expected impacts of those measures on the stock or the fishery.

The Council and Board also approved the use of regional conservation equivalency in 2024-2025. Non-preferred coastwide measures, which are written into the federal regulations but waived in favor of state measures, include an 18.5-inch minimum size, 3 fish possession limit, and open season from May 8-September 30. Precautionary default measures include a 20-inch minimum size, 2 fish possession limit, and open season from July 1-August 31. These measures are only intended to be used for states/regions which do not comply with the conservation equivalency process. State waters measures will be determined through the Commission process in early 2024.

2024-2025 Scup Recreational Measures

A 10% reduction in recreational harvest of scup in 2024-2025 is required under the Percent Change Approach. This reduction is needed because the average RHL for 2024-2025 (12.51 million pounds) falls below the confidence interval around estimated harvest under status quo measures for these years, and stock biomass is more than 150% of the target level. Measures will be restricted to achieve the full 10% reduction in 2024 and then will remain unchanged in 2025 unless new information suggests a major change in the expected impacts of those measures on the stock or the fishery. The Council and Board agreed that the 10% coastwide harvest reduction will be achieved by the states through the Commission process in early 2024.

The Council and Board revisited their previous decision to close the recreational scup fishery in federal waters from January 1 to April 30. The shortened season was recommended by the Council and Board in December 2022, but due to the timing of federal rule making, it is not expected to go into effect until 2024. During this meeting,

the Council and Board discussed concerns that some states may be disproportionately impacted by the federal waters closure. Staff presented an analysis of Vessel Trip Report (VTR) data which were used to estimate total recreational harvest during this time period. The analysis suggests the closure would have minimal impact on overall coastwide harvest given the limited recreational effort for scup that typically occurs between January and April. Based on this analysis and recommendations from the Monitoring Committee, the Council and Board recommended a year-round open season in federal waters for 2024-2025 to give the states greater flexibility when modifying measures to meet the 10% reduction. The Council and Board recommended no changes to the current 40 fish possession limit and 10-inch minimum size in federal waters.

2024 Black Sea Bass Recreational Measures

The Council and Board discussed the approach for recreational black sea bass management in 2024. Recreational measures for 2023 were set for a single year with the intent of setting 2024-2025 measures based on a 2023 management track assessment. However, this assessment was later delayed to 2024 to allow more time to fully develop a research track assessment.

The RDM indicates the confidence interval around the estimated 2024 harvest based on 2023 measures exceeds the 2024 RHL. Combined with the most recent estimate of biomass from the 2021 management track assessment (i.e., 210% of the target level), this would require a 10% reduction in harvest under the Percent Change Approach. However, the Percent Change Approach did not contemplate a situation where the RHL would be revised without updated stock assessment information, as was the case with the 2024 black sea bass RHL. The 2024 RHL is about 5% lower than the 2023 RHL due to three additional years of catch data in the calculations. As such, updated information is only available for one of the two factors that guide decision making under the Percent Change Approach (i.e., an updated comparison of the harvest estimate confidence interval to the RHL, but no updated biomass information). Therefore, the Council and Board agreed with the Monitoring Committee's recommendation to leave recreational black sea bass measures unchanged in 2024. This would treat 2024 as the second year in a two-year cycle with 2023. They noted that this is the only opportunity for unchanged measures across two years for black sea bass under the Percent Change Approach given the expected timing of management track assessments and the sunset of the Percent Change Approach after 2025. Measures for 2025 and 2026 will be set based on updated stock assessment information and updated runs of the RDM.

If states wish to consider slight season adjustments under this status quo approach (e.g., to maintain a Saturday opening), those proposals must be supported by additional runs of the RDM and approved by the Board.

The Council and Board also agreed to continue the use of conservation equivalency to waive federal waters measures in favor of state waters measures. Under the status quo approach, the non-preferred coastwide measures will remain a 15-inch minimum fish size, a 5 fish possession limit, and a May 15 – October 8 open season. Under conservation equivalency, these measures are waived in favor of state measures. The precautionary default measures will remain a 16-inch minimum fish size, a 2 fish possession limit, and a June 1 – August 31 open season. These measures are only intended for states/regions which do not comply with the conservation equivalency process.

Summer Flounder, Scup, Black Sea Bass and Bluefish Recreational Measures Setting Process Framework/Addenda

The Council met jointly with the ASMFC's Interstate Fisheries Management Program Policy Board (Policy Board) to receive an update on the Summer Flounder, Scup, Black Sea Bass, and Bluefish Recreational Measures Setting Process Framework/Addenda. The Council and Policy Board agreed to refine the preliminary range of alternatives by modifying the Biological Reference Point Approach and Biomass Based Matrix Approach alternatives such that measures will no longer be assigned to all bins the first time either approach is used through the specifications process. Over the next several months, the Fishery Management Action Team (FMAT)/Plan Development Team

(PDT) will continue to develop all alternatives under consideration, including providing greater detail on how measures would be set under the Biological Reference Point and Biomass Based Matrix Approaches.

Guidance Document for Council Review of Exempted Fishing Permit Applications for Unmanaged Forage Amendment Ecosystem Component Species

The Council reviewed and approved a Guidance Document for Council Review of Exempted Fishing Permit (EFP) Applications for Unmanaged Forage Amendment Ecosystem Component (EC) Species. The document is intended to establish a standard process for Council review of EFP applications for the 50+ species listed as EC species under the Unmanaged Forage Omnibus Amendment (Forage Amendment). Implemented in 2017, the Forage Amendment established a 1,700-pound possession limit for EC species in Mid-Atlantic Federal waters. The goal of this amendment was to prohibit the development of new and expansion of existing directed commercial fisheries for these species until the Council has had an adequate opportunity to assess the relevant scientific information and consider potential impacts. The Forage Amendment requires use of an EFP as a first step towards the Council considering allowing landings beyond the 1,700-pound possession limit. In addition to establishing a standardized process for EFP review, the guidance document is intended to communicate the Council's priorities regarding EC species to prospective EFP applicants. The final document is available on the Council website at https://www.mafmc.org/forage.

Spiny Dogfish 2024-2026 Specifications

After reviewing advice from its Scientific and Statistical Committee (SSC) and considering input from the public, the Council adopted spiny dogfish specifications for the 2024-2026 fishing years. The Council's recommendations are summarized in the table below.

	2024	**2025**	**2026**
	Million pounds		
Acceptable Biological Catch	15.7	16.1	16.5
Commercial Quota	10.7	11.0	11.2

The Council recommended no changes to the current federal trip limit of 7,500 pounds. These specifications are expected to keep the stock slightly above its target biomass. The 2023 management track assessment concluded that the spiny dogfish stock was neither overfished nor experiencing overfishing in 2022. However, due to the stock's reduced productivity, these relatively low future catches are needed for the stock to stay at the target. The 2024 quota is an 11% decrease compared to the 2023 quota and a 64% decrease compared to the 2022 quota. During the meeting, several fishing industry participants expressed serious concerns about the potential consequences of lower quotas.

A key debated component of setting the commercial quota was the set-aside for dead commercial discards. The Council considered several approaches and ultimately decided to set aside the same amount in 2024 as the assessment estimated in 2022, the most recent year available – about 4.7 million pounds (2,134 MT). The Council noted that there has been a downward trend in discards over the last 10 years, making the most recently estimated discard amount a reasonable proxy for near-future discards. To account for the assessment's prediction of slight increases in biomass for 2025 and 2026, the Council voted to set aside slightly more discards in those years (about 4.8 million pounds and 4.9 million pounds respectively). There are no recreational regulations, but recreational mortality is accounted for when calculating the commercial quota.

Because the spiny dogfish fishery is managed jointly, the New England Fishery Management Council must also make recommendations for spiny dogfish specifications at its upcoming meeting in January 2024.

2024-2025 Atlantic Mackerel Specifications

After reviewing advice from the SSC and considering input from the public, the Council adopted Atlantic mackerel specifications for the 2024-2025 fishing years. The Council's recommendations are summarized in the table below.

	2024	**2025**
	Metric Tons	
Acceptable Biological Catch	3,200	3,200
Commercial Quota	868	868

These specifications will replace the preliminary measures approved by the Council in August. As requested by the Council, the SSC provided two sets of ABC recommendations – one using a "varying" approach, which would set the ABC lower in 2024 and higher in 2025, and one using an "averaged" approach, which would produce an average ABC for both years. The Council ultimately selected the averaged approach, resulting in ABCs of 3,200 MT for both years. After accounting for expected Canadian catch, U.S. recreational catch, and U.S. commercial discards, the Council recommended setting the commercial quota at 868 metric tons (1.9 million pounds) for both years. Given the low quota, the commercial fishery will be limited to mostly incidental landings. To constrain catch to the very low quotas while avoiding excessive discarding, the Council recommended setting an initial trip limit of 20,000 pounds for limited access permits and 5,000 pounds for open access permits. Once 80% of the quota has been landed, trip limits would change to 10,000 pounds for limited access permits and 2,500 pounds for open access permits. No changes were recommended for the recreational sector; the impacts of recent recreational measures (a first ever 2023 bag-limit of 20 fish per person) will be evaluated in the future.

Atlantic mackerel has been under a rebuilding program since November 2019, and a revised rebuilding plan was implemented in 2023. The most recent management track stock assessment found that the stock remains overfished, with spawning stock biomass estimated to be at about 12% of the biomass target. While these measures should support rebuilding across a range of recruitments, achieving a rebuilt Atlantic mackerel stock that regularly supports optimum yield near the assessment's target fishing rate will depend on getting more typical recruitment and increased survival of more mackerel into older age classes.

Golden Tilefish Individual Fishing Quota Program Twelve-Year Review

The Council received a presentation on the golden tilefish Individual Fishing Quota (IFQ) program review report prepared by Northern Economics, Inc. The golden tilefish fishery has operated under an IFQ program, which is a type of limited access privilege (LAPP) program, since the implementation of Amendment 1 in 2009. The 2007 reauthorization of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) established new requirements related to the monitoring and review of LAPP programs. In 2017, the Council conducted the first golden tilefish IFQ program review, which covered performance from fishing year (FY) 2010 to FY2015. The current review includes updated data and analyses through FY2021. This presentation marked the beginning of a 30-day public comment period which will end on January 12, 2024. Details and comment instructions are available at https://www.mafmc.org/newsfeed/2023/golden-tilefish-ifq-review.

2024 Implementation Plan

The Council reviewed and approved the 2024 Implementation Plan after making several revisions. The Council recommended removing Deliverable #9 (scup GRA framework) from the main list of deliverables and replacing it with a framework to consider moving the western boundary of the summer flounder small-mesh exemption area and to clarify the regulatory definition of a flynet, along with several associated issues (enrollment period, evaluation criteria). The Council also agreed to modify the wording of Deliverable #74 and move it from Possible Additions to the main list of deliverables. This task will involve coordinating with the New England Council to

explore the utility of Vessel Monitoring Systems (VMS) for enforcement. The approved implementation plan is available at https://www.mafmc.org/strategic-plan.

Responsible Offshore Science Alliance

The Executive Director of the Responsible Offshore Science Alliance (ROSA) provided an update to the Council on ROSA's mission and 5-year strategic goals and objectives. ROSA is a non-profit organization that advances research, monitoring, and methods on the effects of offshore wind energy development on fisheries across US federal and state waters. Key strategies include: 1) coordinating offshore wind fisheries research and monitoring, 2) facilitating assessment of regional and cumulative impacts, and 3) maintaining ROSA offshore wind project monitoring framework and guidelines.

Next Meeting

The next Council meeting will be held **February 6-7, 2024, in Arlington, VA.** A complete list of upcoming meetings can be found at https://www.mafmc.org/council-events.

Mid-Atlantic Fishery Management Council
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P. Weston Townsend, Chairman | Michael P. Luisi, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: November 29, 2023

To: Chris Moore

From: J. Didden, Staff

Subject: 2024-2026 Spiny Dogfish Specifications

The Council plans to adopt 2024-2026 Spiny Dogfish specifications at the December 2023 Council Meeting, with New England Fishery Management Council action following in January 2024 (the plan allows NMFS to resolve differences). Council staff supports the Joint Spiny Dogfish Committee recommendations, which are detailed in the first supporting document below:

-Spiny Dogfish Committee Nov 2023 Meeting Summary (with Committee recommendations)

-Spiny Dogfish Monitoring Committee Nov 2023 Summary

-Scientific and Statistical Committee (SSC) Oct 2023 Report (see Committee Reports Tab)

-Staff Oct 2023 Acceptable Biological Catch (ABC) Memo

-Advisory Panel (AP) 2023 Fishery Performance Report

-2023 Fishery Information Document

-Submitted Comments

Supplemental Material Links

-Preliminary 2023 Partial Year Discards

-SSC October 2023 Meeting Page (includes links to assessment materials)

Spiny Dogfish Committee Meeting Summary

November 17, 2023 - Webinar

Overview: The Joint[1] Spiny Dogfish Committee met on November 17, 2023 from 9 am to 11:40 am and developed recommendations for 2024-2026 spiny dogfish specifications, detailed below. The regulations guiding these recommendations are detailed in 50 CFR 648.230-232, but generally involve ensuring that the Annual Catch Limit (ACL) is unlikely to be exceeded – any ACL overages trigger pound-for-pound paybacks from a subsequent year. The MAFMC and NEFMC will meet in the coming months to consider the Committee's recommendations and adopt specifications.

Committee Member Attendees: Sonny Gwin (Chair), Dan Farnham, Mark Alexander, Skip Feller, Daniel Salerno, Michael Luisi (ex-officio), Adam Nowalsky, Joe Grist, Wes Townsend (ex-officio), Eric Reid (ex-officio), Alan Tracy, Chris Batsavage, Jay Hermsen (NMFS), Nichola Meserve, Rick Bellavance, and Toni Kerns (ASMFC).

Other Attendees: Jason Didden, Alan Bianchi, Aubrey Church, Bob Blais, Cynthia Ferrio, David McCarron, Dvora Hart, James Fletcher, James Boyle, John Whiteside, Jonathan Auguste, Megan W, Michelle Passerotti, Paul Rago, Pierre Juillard, Renee Zobel, Roger Rulifson, Scott MacDonald, Didden2, and Mark Sanford.

Background Discussion Summary

Jason Didden of MAFMC staff first provided an overview of: the spiny dogfish assessment; the Scientific and Statistical Committee's (SSC) Acceptable Biological Catch (ABC) recommendations; the Advisory Panel's (AP) Fishery Performance Report; and the Monitoring Committee's recommendations (detailed supporting documents were provided and will also be available for the Councils' meetings). Several clarifying discussions preceded Committee deliberations including:

-The 54% target chance of not overfishing is a result of the MAFMC's risk policy.

-Uncertainties about data inputs are considered as part of assessment peer reviews.

-The large quota changes from, for example 2016 (about 40 million pounds), to 2024 (likely about 10 million pounds) are primarily the result of earlier overestimation of productivity. Follow-up by staff found that according to the current assessment, the 2016 quota should have been only around 11 million pounds (2016 landings were about 25 million pounds, still too high even though substantially below the 40-million pound quota). (Values are approximate given the assessment uses calendar years.)

[1] The federal spiny dogfish fishery is managed with a joint plan by the Mid-Atlantic Fishery Management Council (MAFMC, lead) and the New England Fishery Management Council (NEFMC).

-Discard estimates were generated based on both the ratio of observed discards to kept fish and overall fishing activity as measured by landings (the discard ratio is applied to totaled landings by gear type to estimate discards). If there are less boats and less activity and less landings now than earlier, the lower activity/landings result in lower discard estimates (unless the discard rate increased to offset the lower fleet activity). The modeled future discards coming out of the assessment integrate the historic discard information as well as the trends in biomass forecasted by the model.

Summary of General Public Comments Provided During Background Discussion

- Fishermen do not see downward trends in either abundance or size of fish in landings.
- This is history repeating itself just like in 1999 – we are once again begging you not to put us out of business unnecessarily.

Committee Specifications Motion/Recommendation Summary

The Committee passed the following motion regarding specifications:

Move to recommend that the Councils adopt 2024-2026 dogfish specifications that include the following deductions from the SSC-specified ABCs: the most recent estimate of Canadian landings (36 MT[2]); no buffer for management uncertainty (0 MT); the model-predicted year-specific discards (2,382 MT for 2024; 2,441 MT for 2025; and 2,494 MT for 2026); and the most recent 3-year average recreational landings (112 MT). This results in commercial quotas of 4,605 MT (10.15 mil. pounds) for 2024; 4,723 MT (10.41 mil. pounds) for 2025; and 4,831 MT (10.65 mil. pounds) for 2026. (Reflected in Table 3 of Monitoring Committee summary.)
Meserve/Luisi, 14/1/1 Motion passes

Rationale for the motion included:

-The model-generated discards are objective and more likely to reflect actual discards than a recent three-year average or the most recent year (2022) estimate. It also is in between the amounts generated by those other two approaches, though closer to the 2022 estimate.

-Not using a management uncertainty buffer does not indicate a lack of uncertainty or zero risk of exceeding the Annual Catch Limit (ACL), but the model discard approach is more rigorous than last year's staff ad-hoc approach, and industry has again clearly indicated that they are willing to accept the higher risk of future paybacks given the current tenous existence of the spiny dogfish fishery. There have been no recent overages, and small future overages could be absorbed by the slight ABC increases in 2025 and 2026. The Atlantic States Marine Fisheries Commission (ASMFC) quota rollover provisions could increase the quota by potentially up to 600,000 pounds depending on 2023 fishing year performance (too soon to predict), but the state/regional allocations also add a de-facto buffer because states are unlikely to relinquish all of their quota through transfers.

-Overall this approach balances responsibility to the resource and needs of industry as best possible.

[2] MT = metric ton. One metric ton equals about 2,204.6 pounds, so 100 MT equals about 220,000 pounds and 1,000 MT equals about 2.2 million pounds.

A motion to substitute the lower 2022 discard estimate of 2,134 MT failed on an 8/8/0 vote. The rationale for the failed substitute referenced the industry input, historical trends, socioeconomic impact (including the dogfish fishery's gap-filling role for many participants particularly January-April), and the various uncertainties involved. There was also concern about dogfish's impact on the ecosystem. It was noted the industry has clearly stated they are willing to risk future paybacks/disruptions if there are overages given the current tenuous state of the industry. Concern about the static nature (same discards for all three years) of this approach was noted given the predicted biomass increases. The NMFS representative noted they would not support the substitute motion,

During discussion of the substitute, it was clarified that if the two Councils adopt different measures, NMFS can implement either Council's measures or implement a modified version, but NMFS can't implement something that was rejected by both Councils. In recent years the ASMFC has mirrored the federal measures, but the ASMFC plan is not directly linked to the federal plan, and the ASMFC has adopted differing quotas in the past (NMFS will still close federal waters when the federal quota is reached). There was also discussion of whether specifications could just be set for one year and then reviewed. Staff noted that even if multi-year specifications are set, the specifications are reviewed each year by the SSC and MAFMC, and can be modified year to year. If the SSC changes the ABC(s) after review, then specifications would need to be modified. It was noted that the NEFMC may need to build in dogfish specifications review into its workload planning, depending on the nature of the review.

Summary of Public Comments Provided During Motion Discussion

John Whiteside: The above motion's quota is too low and we need to consider the de-facto buffer created by the ASMFC's state/regional allocations. The risk of an overage is overshadowed by the risk of not having a viable business due to unnecessarily low quotas. The 2,134 MT 2022 discard estimate is more appropriate, and would give industry another 500,000 pounds of quota. At this point every little bit helps significantly, because European buyers are starting to explore other sources given uncertainty about supply from the US, and if we lose our market, this industry is over (the supply disruption from Virginia and inability to maintain year-round Massachusetts processing staff is already critically challenging).

Pierre Juillard: Agree with John. We are at a critical point and Europeans are starting to turn to local markets – we need every pound to have a chance of still being here in a few years.

Scott MacDonald: We need to listen to John and Pierre. I'm out of the fishery/packing because I could not re-sign a lease given all of this uncertainty. We will also lose Pierre/SeaTrade if we don't take this seriously.

Trip Limit Discussion Summary

While no action is required regarding the federal trip limit (currently 7,500 pounds per trip), there was some discussion of how trip limits might relate to potential specifications changes and/or future performance. No rationale to change the federal trip limit emerged and no related motions were made. There was a question whether a relationship existed between trip limit changes and discard changes, but that question has not been examined in detail, and most

discards are not occurring in the directed fishery that is constrained by trip limits. Staff observed that in recent years the fishery has utilized higher trip limits quickly upon implementation.

Male Fishery Discussion Summary

A question was asked what the next steps might be for facilitating a male-focused spiny dogfish fishery. Staff responded that the recent assessments do estimate biomass by sex but had not had time to explore options for a mostly separate harvest of male fish. A next step would be for the NMFS Northeast Fisheries Science Center to conduct analyses that could evaluate higher male harvest, and then related management measures could be considered (associated ABC, times/areas where mostly males would likely be caught, female by-catch set aside, etc.). It is not yet clear whether markets could be established for the smaller males, but there is some persisting interest in at least allowing the potential for such a fishery.

Spiny Dogfish Monitoring Committee Meeting Summary

November 6, 2023 - Webinar

The Mid-Atlantic Fishery Management Council's (Council) Spiny Dogfish Monitoring Committee met on November 6, 2023 from 12:30pm to 3:15pm to develop recommendations for 2024-2026 specifications. The regulations guiding these recommendations are detailed in 50 CFR 648.230-232, but generally involve ensuring that the Annual Catch Limit (ACL) is unlikely to be exceeded – any ACL overages trigger pound-for-pound paybacks from a subsequent year. A key theme was the tradeoff between maximizing the limited available quota for 2024-2026 versus avoiding ACL overages and paybacks that could be disruptive to future fishing years.

Monitoring Committee Attendees: Jason Didden, Angel Willey, Conor McManus, Cynthia Ferrio, David McCarron, Dvora Hart, John Whiteside, Melinda Lambert, Nichola Meserve, and Scott MacDonald (100% attendance).

Other Attendees: Sonny Gwin, Bob Blais, Chris Batsavage, Chris Rainone, James Fletcher, Jared Auerbach, Joe Grist, Pierre Juillard, Wes Townsend, and Daniel Salerno.

Assessment Discussion

Jason Didden began the meeting with a summary of the assessment and the Council's Scientific and Statistical Committee's (SSC) findings. The assessment concluded that 2022 biomass (measured as pups/spawning output) was just above its target despite being relatively low, and that relatively low future catches are needed to stay at the target (due to the stock's reduced productivity). The SSC utilized the assessment model's conclusions and projections to set the following Acceptable Biological Catches (ABCs): 2024: 7,135 metric tons (MT), 2025: 7,312 MT; 2026: 7,473 MT. The 2024 ABC of 7,135 MT is 8.4% lower than the 2023 fishing year ABC of 7,788 MT. Both the Monitoring Committee and Public first engaged in discussion regarding the assessment, summarized below:

John Whiteside noted that the SSC remarked that recent changes in growth/size/maturity/ maximum-observed-female-size cannot be explained by direct effects from fishing (unlike the changes seen in the 1990s during more intense size-selective fishing). Dvora Hart hypothesized that there may be an indirect effect occurring where the smaller surviving females from the 1980s-1990s have been producing smaller fish.

Pierre Juillard noted that the primary processor has seen similar sized fish for the last 3-4 years. Dvora Hart highlighted Figure 3 from the SS3 assessment report (at https://www.mafmc.org/ssc-meetings/october-30-2023), which indicated landings did show a relatively similar/stable proportion of larger females from 2020-2022 but also declines both during the initial 1980s/1990s directed fishery and after the more recent 2012 landings peak. Other data (the

NMFS spring bottom trawl survey and other commercial fleets' landings and discards) also show historical declines of larger females. There was substantial discussion on whether recent reduced portside sampling could create a distorted understanding of the landings' length composition used within the assessment. Given the likely seasonal and/or spatial variability, higher sample sizes would be worthwhile. Follow-up discussions with Northeast Fisheries Science Center (NEFSC) staff clarified that the length data for the gillnet landings (where most landings come from) stem from both portside sampling of gillnet trip landings and at-sea sampling of kept fish on observed gillnet trips (mostly observer trip data in recent years). Scott MacDonald noted that vessels have been using smaller gear inshore in recent years to minimize trip costs, which could influence the size of dogfish in the landings (this could potentially be examined with observer data in the future). He observed relatively larger dogfish during the most recent Virginia fishing season - late 2022/early 2023 (the current assessment includes data through 2022). Discussion noted that there are some large fish seen in landings data in recent years, but a lower proportion compared to the 1980s or the early 2010s. Having state samplers collect landings' length information was raised as a possible solution, as was the possibility of sampling at the Massachusetts processor since almost all spiny dogfish landings are shipped to one Massachusetts processor.

Scott MacDonald observed that catch limits must have been set way too high during recent overfishing (2011-2021), since recent catches were substantially below their respective Acceptable Biological Catches (ABCs). According to the new assessment, this is true. Scott suggested that we should be wary of destroying this fishery with lower quotas given the variability we've seen in ABC recommendations in recent years (indicating high uncertainty).

Chris Rainone highlighted that the erroneous yo-yo assessment/management is making it impossible to sustain participation, and putting portions of the fishery out of business. He stated we should have a gillnet survey to avoid being in such a data poor situation and need to better account for climate/ecosystem impacts. He and Scott MacDonald also questioned whether we know if this model is better than previous approaches. Dvora Hart followed-up that this is the first standard statistical model that has been produced for the U.S. Atlantic spiny dogfish stock, and one advantage of now having a statistical population model is that there should be improved interannual stability in population size estimates and projections moving forward.

Specifications Discussion and Recommendations[1]

The ABCs recommended by the SSC, which are binding catch constraints are: 7,135 metric tons (MT) for 2024, 7,312 MT for 2025, and 7,473 MT for 2026. These resulted from application of the Council's risk policy to address scientific uncertainty, which, for a stock slightly above its biomass target (as dogfish is predicted to be for these years) dictates about a 54% chance of not overfishing. On average for these years, about 663 MT (a little more in 2024 and a little less in 2026) is set aside from the estimated overfishing level catch estimate to achieve the slightly better than 50% chance of avoiding overfishing (i.e. the 54% chance goal). This equates to setting aside 8%-9% of each year's estimated overfishing level of catch to address scientific uncertainty (i.e. to be slightly more than 50% certain that overfishing is not occurring).

[1] Current 2023 fishing year specifications are detailed in Table 4.

Canadian Landings Set-Aside:

The Monitoring Committee has previously recommended the most recent available Canadian estimates for a set-aside. The Canadians updated their 2019 landings estimate to 36 MT (previously 37 MT). This value is now somewhat outdated but does not cause concern given the small magnitude of Canadian landings. Some recent years have been a bit higher and others a bit lower (1 MT-54 MT range 2015-2019). The Monitoring Committee recommended setting aside 36 MT to account for Canadian landings.

Recreational Set-Aside:

The Monitoring Committee recommended setting aside the most recent 3-year average of 112 MT to account for recreational landings, a small component of total catch. This is less than the 2021 estimate of 214 MT used to set the 2023 specifications. The assessment's 2020, 2021, and 2022 recreational harvest estimates of 101 MT, 215 MT, and 19 MT respectively have PSEs in the 30-50% range (i.e. PSE's which warrant a "caution" from NMFS in terms of precision).

Dead discard set-aside and management uncertainty buffer:

The specific charge of the Monitoring Committee to recommend measures that *"ensure"* overages do not occur would be impossible without very large buffers that result in very small commercial quotas and would regularly fail to catch optimum yield. Accordingly, in recent years the Monitoring Committee has taken the approach of making recommendations that would constitute a good faith effort to avoid substantial overages in typical years. This approach should enable optimum yield to be caught in most years but in any given year there will be a possibility of unexpectedly high discards (primarily from other fisheries), possibly causing substantial ACL overages and potentially disruptive pound-for-pound paybacks in future years (especially if the full landings quota is also attained).

The discard set-aside and management uncertainty buffer are linked because the primary management uncertainty issue that could cause ACL overages (and then paybacks) is the difficulty in setting aside an appropriate amount for dead discards. In the last ten years of the assessment (2013-2022) dead discards varied from about 7,400 MT (2014) to 2,100 MT (2022). Note the management track assessment report provides discard amounts before gear-specific discard mortality rates are applied (these rates have been reviewed and accepted but are likely imprecise). The trend since 2013 is downward, though much of the trend is driven by 2013-2014 being relatively high and 2022 being relatively low. Annual discards vary due to both trends in actual discards as well as estimation imprecision, though spiny dogfish discards are not particularly uncertain relative to other species in the region.

The ex-officio industry members of the Monitoring Committee (John Whiteside and Scott MacDonald) recommended that the 2022 discard estimate, 2,134 MT, be set-aside for 2024-2026 along with taking no deduction for a management uncertainty buffer (Table 1 below). Their rationale for using the 2022 discard estimate was that it is the most recent discard estimate and discards have been trending down. The 2022 discard estimate (2,134 MT) is close to what was set aside for 2023 (2,088 MT), so the scaling down approach taken last year appears to be working. Also. 2,134 MT would be a small increase from the current discard set aside. Their

rationale for not needing a management uncertainty buffer included that the state/regional landings allocations create an implicit massive buffer in landings versus the commercial quota to offset any theoretical issues with higher-than-expected discards. Also, it was noted that any catch overages could be offset by the planned increases in the ABC in 2025/2026. Finally, Scott MacDonald closed his business that previously bought almost all the dogfish landed in Virginia, and it is unclear whether another dealer will be able to facilitate similar annual volume from Virginia (averaging 4 million pounds). They noted the critical negative impact from sequestering potentially available quota at these low catch limits – there won't be an industry left if any potential quota is made uncatchable, forcing the last processor to close. John and Scott disagreed that the approaches (either "A" or "B" below) suggested by the rest of the Monitoring Committee were reasonable or appropriate, given their rationale described above and tenuous state of the industry at even the current 2023 quotas (12.0 million pounds). It was also suggested that federal dealers could be required to switch to daily reporting of landings to minimize any potential landings overages.

The rest of the Monitoring Committee was concerned that combining the lowest recent discard estimate with no management uncertainty buffer may not be objective and could lead to large ACL overages and paybacks/disruptions in future years. The low overall 2022 discard estimate was also unusually low for small mesh gear. There is also a possibility of landings over-running the commercial quota after a federal waters closure, but some states match the federal measures (including Virginia which typically harvests toward the latter part of the fishing year). Discussion noted that part of the rationale last year for a potential management uncertainty buffer was the ad-hoc approach used for discards, and the two approaches for discards suggested below may reduce the need for uncertainty buffers. Conversely, discards are primarily the result of activity in other (trawl) fisheries, and the model is not integrating potential future effort changes in other relevant fisheries. The Monitoring Committee did not recommend a specific buffer amount, but noted the same buffer trade-off evaluated in previous years: higher buffers provide less quota now but lower chances of overages/paybacks; lower buffers result in more quota now but greater chances of overages/paybacks. This group did reach consensus on two approaches that should avoid substantial ACL overages (though an unexpectedly very high discard estimate could still lead to substantial ACL overages):

A) If a three-year average of discards is set aside (3,128 MT), that amount captures recent discard variability sufficiently such that a management uncertainty buffer would probably not be needed to avoid substantial overages. This would mean setting aside 3,128 MT for discards, which will substantially reduce commercial quotas from current levels even without any management uncertainty buffer. (Table 2 below)

B) The assessment model generates expected discards for the projection period in an objective manner despite uncertainty – as biomass slowly increases the model projects that discards will increase slowly as well. The Monitoring Committee noted that there is sensibility in using the model generated projected discards, just as is done by using the model generated ABCs. The projected amounts set aside for discards would be 2,382 MT for 2024, 2,441 MT for 2025, and 2,494 MT for 2026. The Monitoring Committee could not reach consensus on whether a management uncertainty buffer was needed if setting aside these model-generated discards, but did concur with the following statement: If the model-generated discard amounts are set-

aside, then the Committee may want to consider at least a small management uncertainty buffer given there is a 50% chance that realized discards will be higher (or lower) than those projected (due to the statistical nature of such estimates). Table 3 below describes the specifications using these discard amounts and zero uncertainty buffer, but staff will be able to illustrate varied management uncertainty buffers during the Committee meeting. Any management uncertainty buffer reduces the commercial quota by the same amount. A buffer amount therefore largely depends on the Councils' tolerances for potential overages and future paybacks, weighed against the immediate effect of reducing quota via a buffer.

Additional Public Comment

Pierre Juillard: The zero percent buffer is almost a necessity to get enough quota to keep processing beyond 2024. The peaks and valleys of quota have gotten us from four processors to just one.

Jared Auerbach: You can't decimate an industry where there's inexact science. Without a higher quota we're going to lose the current generation of participants as well as the next generation of entrepreneurs to invest in boats/processing/marketing.

Chris Rainone: The 30% discard mortality for gill nets is not believable given how we fish our gear for short soaks – the fish I released today out of Barnegat Light all swam away. If you put this quota below 10 million pounds we're in trouble as a fishery and we're already losing docks to wind – we won't have anywhere to go. You're going to put us out of business and yourselves because if there's no fishery to manage what are you going to do. At this rate you might as well put the nail in the coffin.

Daniel Salerno: I'm a little concerned about how you're looking at discards – if you take out 2013/2014 and 2022, discards were pretty flat from 2015-2021 and 2022 seems unnaturally lower than the previous 6-7 years. You may be underestimating the potential for higher dead discards occurring in 2024-2026.

Trip Limits

The Monitoring Committee also discussed trip limits, noting that trip limits (pounds per trip) have increased sequentially over the last decade (3,000 in 2009-2012, 4,000 in 2013, 5,000 in 2014-2015, 6,000 in 2016-2021, 7,500 in 2022-2023). Given recent performance, it's not clear whether the current 7,500-pound trip limit may cause early closures of the fishery, but all else being equal the quota will be utilized faster at higher trip limits compared to lower trip limits (many trips land right at the trip limit). Depending on fishery performance at the expected lower quotas, consideration of trip limit modifications may be warranted in the future. Scott MacDonald also mentioned that lowering the trip limits can make it harder to pack a truckload for shipment to the Massachusetts processor and lowering the trip limit could hurt vessels given high fuel prices. Thus, the Monitoring Committee did not see justification for recommending changes to the federal trip limit at this time.

Table 1. Whiteside/MacDonald Recommended Specifications

Specifications	2024 (pounds)	2024 (mt)	**Basis**
OFL (from SSC)	17,235,719	7,818	SS3 Assessment
ABC (from SSC)	15,729,964	7,135	SSC / Risk Policy
Canadian Landings	79,366	36	= 2019 estimate, most recent
Domestic ABC	15,650,597	7,099	= ABC – Canadian Landings
ACL	15,650,597	7,099	= Domestic ABC
Mgmt Uncert Buffer	0.0%	0.0%	See discussion
Amount of buffer	0	0	
ACT	15,650,597	7,099	= ACL - mgmt uncert buffer
U.S. Discards	4,704,659	2,134	=2022 estimate
TAL	10,945,938	4,965	ACT – Discards
U.S. Rec Landings	246,917	112	2020-2021-2022 avg
Comm Quota	10,699,021	4,853	TAL – Rec Landings
Specifications	2025 (pounds)	2025 (mt)	**Basis**
OFL (from SSC)	17,570,821	7,970	SS3 Assessment
ABC (from SSC)	16,120,181	7,312	SSC / Risk Policy
Canadian Landings	79,366	36	= 2019 estimate, most recent
Domestic ABC	16,040,815	7,276	= ABC – Canadian Landings
ACL	16,040,815	7,276	= Domestic ABC
Mgmt Uncert Buffer	0.0%	0.0%	See discussion
Amount of buffer	0	0	
ACT	16,040,815	7,276	= ACL - mgmt uncert buffer
U.S. Discards	4,704,659	2,134	=2022 estimate
TAL	11,336,156	5,142	ACT – Discards
U.S. Rec Landings	246,917	112	2020-2021-2022 avg
Comm Quota	11,089,239	5,030	TAL – Rec Landings
Specifications	2026 (pounds)	2026 (mt)	**Basis**
OFL (from SSC)	17,905,924	8,122	SS3 Assessment
ABC (from SSC)	16,475,125	7,473	SSC / Risk Policy
Canadian Landings	79,366	36	= 2019 estimate, most recent
Domestic ABC	16,395,759	7,437	= ABC – Canadian Landings
ACL	16,395,759	7,437	= Domestic ABC
Mgmt Uncert Buffer	0.0%	0.0%	See discussion
Amount of buffer	0	0	
ACT	16,395,759	7,437	= ACL - mgmt uncert buffer
U.S. Discards	4,704,659	2,134	=2022 estimate
TAL	11,691,100	5,303	ACT – Discards
U.S. Rec Landings	246,917	112	2020-2021-2022 avg
Comm Quota	11,444,182	5,191	TAL – Rec Landings

Table 2. Specifications using 3-year average discards and no management uncertainty buffer.

Specifications	2024 (pounds)	2024 (mt)	**Basis**
OFL (from SSC)	17,235,719	7,818	SS3 Assessment
ABC (from SSC)	15,729,964	7,135	SSC / Risk Policy
Canadian Landings	79,366	36	= 2019 estimate, most recent
Domestic ABC	15,650,597	7,099	= ABC – Canadian Landings
ACL	15,650,597	7,099	= Domestic ABC
Mgmt Uncert Buffer	0.0%	0.0%	See discussion
Amount of buffer	0	0	
ACT	15,650,597	7,099	= ACL - mgmt uncert buffer
U.S. Discards	6,896,051	3,128	2020-2021-2022 avg
TAL	8,754,546	3,971	ACT – Discards
U.S. Rec Landings	246,917	112	2020-2021-2022 avg
Comm Quota	8,507,629	3,859	TAL – Rec Landings
Specifications	2025 (pounds)	2025 (mt)	**Basis**
OFL (from SSC)	17,570,821	7,970	SS3 Assessment
ABC (from SSC)	16,120,181	7,312	SSC / Risk Policy
Canadian Landings	79,366	36	= 2019 estimate, most recent
Domestic ABC	16,040,815	7,276	= ABC – Canadian Landings
ACL	16,040,815	7,276	= Domestic ABC
Mgmt Uncert Buffer	0.0%	0.0%	See discussion
Amount of buffer	0	0	
ACT	16,040,815	7,276	= ACL - mgmt uncert buffer
U.S. Discards	6,896,051	3,128	2020-2021-2022 avg
TAL	9,144,764	4,148	ACT – Discards
U.S. Rec Landings	246,917	112	2020-2021-2022 avg
Comm Quota	8,897,846	4,036	TAL – Rec Landings
Specifications	2026 (pounds)	2026 (mt)	**Basis**
OFL (from SSC)	17,905,924	8,122	SS3 Assessment
ABC (from SSC)	16,475,125	7,473	SSC / Risk Policy
Canadian Landings	79,366	36	= 2019 estimate, most recent
Domestic ABC	16,395,759	7,437	= ABC – Canadian Landings
ACL	16,395,759	7,437	= Domestic ABC
Mgmt Uncert Buffer	0.0%	0.0%	See discussion
Amount of buffer	0	0	
ACT	16,395,759	7,437	= ACL - mgmt uncert buffer
U.S. Discards	6,896,051	3,128	2020-2021-2022 avg
TAL	9,499,708	4,309	ACT – Discards
U.S. Rec Landings	246,917	112	2020-2021-2022 avg
Comm Quota	9,252,790	4,197	TAL – Rec Landings

Table 3. Specifications using modeled discards and no management uncertainty buffer.

Specifications	2024 (pounds)	2024 (mt)	**Basis**
OFL (from SSC)	17,235,719	7,818	SS3 Assessment
ABC (from SSC)	15,729,964	7,135	SSC / Risk Policy
Canadian Landings	79,366	36	= 2019 estimate, most recent
Domestic ABC	15,650,597	7,099	= ABC – Canadian Landings
ACL	15,650,597	7,099	= Domestic ABC
Mgmt Uncert Buffer	0.0%	0.0%	See discussion
Amount of buffer	0	0	
ACT	15,650,597	7,099	= ACL - mgmt uncert buffer
U.S. Discards	5,251,405	2,382	Assessment Predicted
TAL	10,399,193	4,717	ACT – Discards
U.S. Rec Landings	246,917	112	2020-2021-2022 avg
Comm Quota	10,152,275	4,605	TAL – Rec Landings
Specifications	2025 (pounds)	2025 (mt)	**Basis**
OFL (from SSC)	17,570,821	7,970	SS3 Assessment
ABC (from SSC)	16,120,181	7,312	SSC / Risk Policy
Canadian Landings	79,366	36	= 2019 estimate, most recent
Domestic ABC	16,040,815	7,276	= ABC – Canadian Landings
ACL	16,040,815	7,276	= Domestic ABC
Mgmt Uncert Buffer	0.0%	0.0%	See discussion
Amount of buffer	0	0	
ACT	16,040,815	7,276	= ACL - mgmt uncert buffer
U.S. Discards	5,381,477	2,441	Assessment Predicted
TAL	10,659,338	4,835	ACT – Discards
U.S. Rec Landings	246,917	112	2020-2021-2022 avg
Comm Quota	10,412,420	4,723	TAL – Rec Landings
Specifications	2026 (pounds)	2026 (mt)	**Basis**
OFL (from SSC)	17,905,924	8,122	SS3 Assessment
ABC (from SSC)	16,475,125	7,473	SSC / Risk Policy
Canadian Landings	79,366	36	= 2019 estimate, most recent
Domestic ABC	16,395,759	7,437	= ABC – Canadian Landings
ACL	16,395,759	7,437	= Domestic ABC
Mgmt Uncert Buffer	0.0%	0.0%	See discussion
Amount of buffer	0	0	
ACT	16,395,759	7,437	= ACL - mgmt uncert buffer
U.S. Discards	5,498,322	2,494	Assessment Predicted
TAL	10,897,437	4,943	ACT – Discards
U.S. Rec Landings	246,917	112	2020-2021-2022 avg
Comm Quota	10,650,519	4,831	TAL – Rec Landings

Table 4. 2023 Fishing Year Specifications.

Specifications	2023 (pounds)	2023 (mt)	**Basis for 2023 Specifications**
OFL (from SSC)	na	na	na
ABC (from SSC)	17,169,581	7,788	SSC
Canadian Landings	81,571	37	= 2019 estimate, most recent
Domestic ABC	17,088,010	7,751	= ABC – Canadian Landings
ACL	17,088,010	7,751	= Domestic ABC
Mgmt Uncert Buffer	0.0%	0.0%	Higher risk of ACL overages but minimizes potential 2023 disruption to industry
Amount of buffer	0	0	
ACT	17,088,010	7,751	= ACL - mgmt uncert buffer
U.S. Discards	4,603,247	2,088	scaled down from 2017-2019 average
TAL	12,484,763	5,663	ACT – Discards
U.S. Rec Landings	471,789	214	= 2021 estimate
Comm Quota	12,012,974	5,449	TAL – Rec Landings

See Committee Reports Tab for

Scientific and Statistical Committee (SSC) Report on

Spiny Dogfish Acceptable Biological Catches (ABCs)

Mid-Atlantic Fishery Management Council
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P. Weston Townsend, Chairman | Michael P. Luisi, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: October 25, 2023

To: Chris Moore, Executive Director

From: Jason Didden, staff

Subject: 2024-2026 Spiny Dogfish Acceptable Biological Catches (ABCs)

Summary

Based on the 2023 Management Track Assessment, the spiny dogfish stock was neither overfished nor experiencing overfishing in 2022.

The 2022 fishing year (May 1, 2022 to April 30, 2023) landings were about 19% higher than the prior year, but there has been a downtrend in landings since 2012.

The Mid-Atlantic Fishery Management Council (MAFMC) will meet in December 2023 to review the recommendations of the Advisory Panel (AP), the Scientific and Statistical Committee (SSC), the Monitoring Committee, the Spiny Dogfish Committee, and input from the public. The MAFMC will recommend catch and landings limits and other management measures. The New England Fishery Management Council will take similar action in January 2024, and the Atlantic States Marine Fisheries Commission will also meet in January 2024 to consider interstate measures.

Based on the SSC's evaluation of uncertainty, the Council's risk policy suggests Acceptable Biological Catches (ABCs) near or slightly above 7,000 metric tons (MT) for 2024-2026. Staff is concerned about the impact on industry and projection uncertainty. However, the Council's codified control rule and risk policy are designed to integrate such concerns with avoidance of overfishing - as such, staff recommends applying the control rule and risk policy to determine 2024-2026 ABCs (see ABCs in Table 1 and additional discussion under "Staff Recommendation," below).

Current Measures and Review of Prior SSC Recommendations

The last setting of spiny dogfish specifications occurred in 2022 for the 2023 fishing year. The resulting 7,788 MT (17.2 million pounds) ABC and 5,449 MT (12.0 million pounds) quota was a result of the SSC scaling down the previous ABC based on the NEFSC spring survey trends:

> "In absence of a stock assessment, the SSC developed an ad hoc approach that addresses the apparent recent decline in abundance pending confirmation in the upcoming assessment. The method reduced the previous ABC (defined in 2018) by first adjusting it to be consistent with the current Council Risk Policy. The adjusted ABC was then multiplied by

> the ratio of current average female spawning stock abundance (2021 and 2022) to the average for 2016 to 2018. The SSC recommended an ABC of 7,788 mt for the 2023 fishing year. This represents a 55% decrease from the 2022 ABC of 17,498 mt (MAFMC SSC September 2022)."

These specifications represented a 59% reduction in commercial quota for the spiny dogfish fishery from 2022. However, it is not yet clear whether the 2023 quota will be limiting for the 2023 fishing year. Once the coastwide quota is caught, federal waters will be closed for possession of spiny dogfish. If the Annual Catch Limit (ACL) is exceeded, overages are deducted as soon as possible from the ACL for the subsequent fishing year. In 2021, the Councils voted to increase the trip limit for spiny dogfish to 7,500 pounds, which was implemented for the 2022 fishing year.

Recent Landings and Catch

Recent landings peaked in the 2012 fishing year near 12,138 MT (26.8 million pounds) and declined to about 4,797 MT (10.6 million pounds) by 2021. 2022 landings rose to 5,730 MT (12.6 million pounds). The Fishery Performance Report documents industry perspectives on why recent landings have been low relative to quotas, including market constraints, quota disruptions, and other more attractive fishing opportunities. The closure of the primary Virginia spiny dogfish dealer may limit landings later in the 2023 fishing year. Discards (calendar year) accounted for 24%-43% of fishing mortality from 2013-2022. The Fishery Performance Report also notes the tenuous viability of this fishery given the relatively low price per pound, shrinking quotas in recent years, and other challenges.

Stock Status and Biological Reference Points

Based on the Spiny Dogfish Management Track Assessment, which used the Stock Synthesis 3 (SS3) assessment model, the spiny dogfish stock was neither overfished nor experiencing overfishing in 2022. Biomass (spawning output) in 2022 was estimated to be at 101% of the reference point/target, despite being relatively near its all-time low. Fishing mortality in 2022 was 81% of the overfishing threshold (the first time in the last decade without overfishing).

Staff Recommendation

The new assessment's ability to accurately project future biomass trends given various catch levels is untested, and the uncertainties associated with growth mean the biomass reference point/target has considerable uncertainty (note the large biomass reference point changes between the research track and management track assessments). These uncertainties and concerns about the status of the fishery led staff to consider recommending a status-quo ABC (7,788 MT) for 2024-2026. However, considering the successful peer review of the management track assessment, there is no justification to deviate from the Council's codified control rule and risk policy, especially given the recent overfishing and historical trends in both spawning output and total female biomass. The resulting projected ABCs are provided in a spreadsheet at https://www.mafmc.org/ssc-meetings/october-30-2023 and reproduced on the next page in Table 1. Depending on the SSC's assignment of uncertainty (100% or 150% coefficient of variation or "CV" for the calculated overfishing levels), the Council's risk policy suggests Acceptable Biological Catches (ABCs) near or slightly above 7,000 metric tons (MT) for the 2024-2026 fishing years.

Table 1. Council Risk Policy-Based ABCs.

Year	Overfishing Level (OFL)	ABC	Biomass - Spawning Output	Biomass/ Target (188)
	mt	mt	millions pups	
Assuming 100% CVs				
2024	7,818	7,135	202.8	1.08
2025	7,970	7,312	208.7	1.11
2026	8,112	7,473	213.3	1.13
Assuming 150% CVs				
2024	7,818	6,940	202.8	1.08
2025	7,975	7,130	208.9	1.11
2026	8,122	7,301	213.6	1.14

Spiny Dogfish
AP Fishery Performance Report
September 20, 2023

The Mid-Atlantic Fishery Management Council's (Council) Spiny Dogfish Advisory Panel (AP) met via webinar on September 20, 2023 to review the Spiny Dogfish Fishery Information Document and develop the following Fishery Performance Report. The primary purpose of this report is to contextualize catch histories for the Scientific and Statistical Committee (SSC) by providing information about fishing effort, market trends, environmental changes, and other factors. Trigger questions (see below) were posed to the AP to generate discussion of observations in the spiny dogfish fishery. Advisor comments described below are not necessarily consensus or majority statements.

Advisory Panel members attending: Chris Rainone, James Fletcher, Jeremy Hancher, John Whiteside, Kevin Wark, Roger Rulifson, Scott Curatolo-Wagemann, Scott MacDonald, and Mark Sanford.
Others attending: Jason Didden (Council staff lead), Sonny Gwin, Alan Bianchi, Angel Willey, Cynthia Ferrio, David McCarron, and Yan Jiao.

Trigger questions:

The AP was presented with the following trigger questions:

1. What factors have influenced recent catch (markets/economy, environment, regulations, other factors)?
2. Are the current fishery regulations appropriate? How could they be improved?
3. What would you recommend as research priorities?
4. What else is important for the Council to know?

Market/Economic Conditions

Artificially low quota and low quota expectations are dampening demand. If you don't think you can maintain production you're not going to try. Increased fuel costs and dogfish prices also combine to keep landings low.

COVID-19 did not have a large impact on this fishery. Similar market issues persist as with previous years – demand has been low but stable recently – the market could support more landings than in the most recent year if participation/production at the vessel level increases.

Changing the name to Chip Fish would help with marketing/exports. We could sell these in the U.S. if we could change the name (like snakehead). No advisors were opposed but practical name-change challenges have been highlighted in the past.

There are no Southern processors – they were "burnt" by previous management and won't get back in without quota stability on a decadal timeframe. They would need to know that the quota won't go down for 5-10 years. Southern fishermen have to ship to MA. Previous reports have noted not having a processor also depresses NY landings. High fuel costs add to trucking costs, which is a substantial issue for this fishery given the processing situation.

Developing industrial markets, be it fertilizer, processed export, or pharmaceutical (livers), requires a higher trip limit for trawlers. Expanding use of liver components could increase overall value – several outreach efforts have occurred to pharmaceutical companies with no interest expressed back. Industrial uses could help develop a market for male dogfish.

Regarding the fin market – there are self-imposed bans by cargo lines that prohibit fin transport even from sustainable sources (i.e. this is beyond our control).

Better opportunities in other fisheries reduce spiny dogfish effort. For example, in Virginia, fishermen have calculated that oysters and shrimp can be better opportunities. It's hard to attract/pay/retain a crew, often must fish solo. Any disruption to this fishery will exacerbate these issues and make it impossible to sustain participation.

Cornell has tried to expand domestic consumption of spiny dogfish and other undervalued/underutilized/lesser-known species through chefs' sampler events, underserved communities/foodbanks, etc. See https://www.localfish.org/.

Environmental Conditions

Environmental conditions are always a factor in terms of dogfish distribution and availability to fishermen.

In NJ, we see fluctuations in the spring and different behavior seasonally but no major swings in recent years and consistent fall availability.

In VA, also don't see a problem with dogfish – just like there wasn't a problem when we were first forced to "rebuild" dogfish in the 2000s. Science does not reflect our experiences.

Condition of NC and MA inlets makes it very difficult to get product into ports. NC trawl fishermen can't land spiny dogfish in VA due to state regulations. Fish houses continue to go out of business due to low seafood supply.

Management Issues

There's no higher-perspective view of this fishery that you are going to eliminate it totally with further reductions given the likely impacts on the last remaining processor. We need a holistic approach to keep the fishery functioning given the financial impacts of low trip limits (given product is low value), and/or fishery closures. We are at a threshold where interest, and fishermen, will evaporate. Don't say we didn't tell you what the results of further reductions would be.

The artificially-low quota (flawed assessment and previous SSC decisions) broke the supply chain from the south, eliminating the primary southern fish house. The AP has been warning about the impacts on infrastructure of management decisions that are destroying this fishery with rollercoaster-style management and resulting shoreside gentrification. Industry needs managers to improve their awareness of the impacts of decisions. Loss of fish houses is a coast-wide issue – and the loss of infrastructure needs to be addressed to maintain a healthy fishery.

Regulations (especially the trip limit) do not allow a male fishery. State regulations do not allow new fishermen to participate. The current regulations are geared to keep price up and production limited and do not allow industrial production.

There was discussion whether state by state quotas should be reconsidered. (There are no Council-federal state/regional quota allocations but there are Atlantic States Marine Fisheries Commission (ASMFC) quota allocation measures in their inter-state plan.) Eliminating or modifying regional quotas could theoretically expand opportunities and encourage additional processors. There was concern however that eliminating regional allocations may disadvantage southern states given the seasonal rotation of landings regionally and the May 1 fishing year start. A trial of any changes would be warranted. There was also concern about creating more of a derby fishery and additional processing disruptions if quotas are very low and could potentially be landed quickly with less regional constraints. If quota was higher then there would be different considerations. The overall consensus conclusion was that allocation changes would be risky with the current quota situation, and not warranted at this time.

Other Issues

The surveys are not representative of the biomass. Given the lack of an off-shelf survey and vertical water column usage by dogfish, we don't really know the population size. 1/10 of the needed area is surveyed. See Carlson AE, Hoffmayer ER, Tribuzio CA, Sulikowski JA (2014) The Use of Satellite Tags to Redefine Movement Patterns of Spiny Dogfish (Squalus acanthias) along the U.S. East Coast: Implications for Fisheries Management. PLoS ONE 9(7): e103384. https://doi.org/10.1371/journal.pone.0103384. Also see Garry Wright's thesis that concluded that the NEFSC trawl survey is not accurately representing spiny dogfish biomass.

The AP would like a meeting regarding the new assessment and an open discussion with the AP of how the new assessment model works and why it is improved from previous efforts that have been apparent failures.

Windfarm impacts squeeze the fishery from the ocean-side and shoreside gentrification squeezes from the land-side – both are critical stressors in terms of fishery survival.

Allowing dogfish populations to increase has hurt all other fish populations. We need better calculations regarding consumption by dogfish of other fish.

You should account for the continual nature of embryo development/pupping in the assessment.

Bigelow performance issues are doing a disservice to all the fisheries and fishermen. The repeated failure of the Bigelow since 2014 to complete its mission in terms of not fishing at a consistent time seasonally and not achieving planned stations eliminates our ability to have good information about spiny dogfish abundance, given the dependence on the survey for spiny dogfish abundance trends. This compounds uncertainty concerns and the Bigelow performance degrades the credibility of the resulting information (both regarding individual years and interpreting the time series). We have 2/10 years of full surveys in recent years. This affects all species' management. The Council should call in NEFSC's maritime operations manager to account for Bigelow performance issues.

There is concern whether the NEFSC is continuing wire/net measurements to ensure survey consistency. The timing of the survey is critical for spiny dogfish due to the observed migration patterns and not sampling the same areas consistently reduces the meaningfulness of the resulting data.

Research Priorities

We need to utilize commercial fishermen more in developing indices of abundance (not just the Bigelow). Fishermen are losing trust in the process with constant changes and new models. The CPUE-type indices being developed for monkfish should be considered for dogfish.

Explore using 3-D printing technology to improve "fillet" production from spiny dogfish.

Consider whether/how electro-fishing surveys could be used.

To add fishery value, we should research the value and production of squalamine in spiny dogfish livers for medical use.

We should conduct research into the purposes of the horn/spine – is it offensive (weakening potential prey), or defensive?

Off the shelf sampling needs to occur to understand biomass. Why can't Bigelow do some deeper sampling? Could we send a drone to monitor?

East Carolina Univ has tagged 43,000+ spiny dogfish – trying to get graduate student to publish. Appears to be an availability gap from years 2-8/10 where if not caught in first few years fish are not caught for a number of years but then eventually show back up in commercial catches.

Updated bycatch mortality information could help us understand biomass trends.

Could there be electromagnetic energy being transferred to the trawl affecting survey catches?

Why are people opting out of this fishery? Greying of the fleet? Costs? Other fisheries? We need to understand the vast drop in participation and what is projected for future trends.

Spiny dogfish fishing could have an environmental justice component as a relatively low-priced seafood.

Spiny Dogfish Fishery Information Document

September 2023

This Fishery Information Document provides an overview of the biology, stock condition, management system, and fishery performance for spiny dogfish (*Squalus acanthias*) with an emphasis on recent data. Data sources for Fishery Information Documents are generally from unpublished National Marine Fisheries Service (NMFS) survey, dealer, vessel trip report (VTR), permit, and Marine Recreational Information Program (MRIP) databases and should be considered preliminary. For more resources, including previous Fishery Information Documents, please visit http://www.mafmc.org/dogfish.

Key Facts

- 2022 fishing year landings were about 19% higher than the previous year, but still relatively low in the context of the most recent 10 years.
- The current 2023 fishing year quota is about 12.0 million pounds (59% lower than 2022).
- A peer review of the 2023 Management Track Assessment is pending – the assessment uses data through 2022. Staff will summarize the peer review of the assessment at the Advisory Panel meeting on September 20, 2023.

Basic Biology

Spiny dogfish is the most abundant shark in the western north Atlantic and ranges from Labrador to Florida, being most abundant from Nova Scotia to Cape Hatteras, North Carolina. Migrations are believed to primarily occur in response to changes in water temperature. Spiny dogfish have a long life, late maturation, a long gestation period, and relatively low fecundity, making them generally vulnerable to depletion. Fish, squid, and ctenophores dominate the stomach contents of spiny dogfish collected during the Northeast Fisheries Science Center (NEFSC) bottom trawl surveys, but spiny dogfish are opportunistic and have been found to consume a wide variety of prey. More detailed life history information can be found in the essential fish habitat (EFH) source document for spiny dogfish at: https://www.fisheries.noaa.gov/region/new-england-mid-atlantic#science. [1]

Status of the Stock

A peer review of the 2023 Management Track Assessment is pending. While the 2023 Management Track Assessment and the 2022 Research Track Assessment both indicate recent declines in spiny dogfish biomass, the status of the stock is not yet clear.

Management System and Fishery Performance

Management

The Council established management of spiny dogfish in 2000 and the management unit includes all federal East Coast waters. Quotas are set based on the current science and Council's risk policy to avoid overfishing and rebuild stocks if/when necessary.

Access to the fishery is not limited, but a federal permit must be obtained to fish in federal waters and there are various permit conditions (e.g. trip limit and reporting). There is a federal trip limit of 7,500 pounds (increased from 6,000 for the 2022 fishing year). Some states mirror the federal trip limit, but states can set their own trip limits. The annual quota has been allocated to states through the Atlantic States Marine Fisheries Commission (http://www.asmfc.org/species/spiny-dogfish).

Commercial Fishery (Recreational catch comprises a relatively low portion of fishing mortality)

Figure 1 and Table 1 illustrate spiny dogfish landings for the 2000-2022 fishing years relative to the quotas in those years. The Advisory Panel has previously noted that the fishery is subject to strong market constraints given weak demand. 2022 fishing year landings were about 19% higher than the previous year, but still relatively low in the context of the most recent 10 years.

Figure 2 provides inflation-adjusted spiny dogfish ex-vessel prices in "2022 dollars." Partial-year 2023 prices to-date are also provided (also in "2022 dollars").

Figure 3 illustrates preliminary landings from the 2023 and 2022 fishing years relative to the current quota. The last data point (2023) is typically the most incomplete.

Tables 2-4 provide information on landings in the 2020-2022 fishing years by state, season, and gear type. The seasonal periods were changed since the last document to maintain data confidentiality.

Table 5 provides information on the numbers of participating vessels that have at least one federal permit. State-only vessels are not included, but the table should still illustrate overall trends in participation.

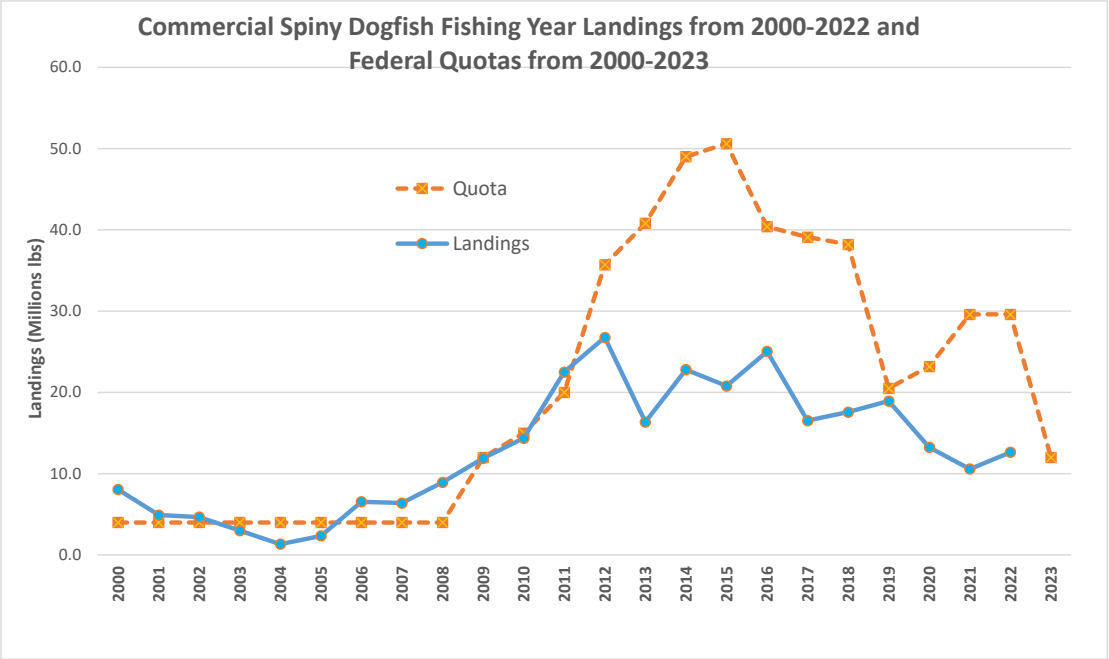

Figure 1. Annual spiny dogfish landings and federal quotas 2000-2023 Source: NMFS unpublished dealer data. [2]

Table 1. Annual spiny dogfish landings and federal quotas 2000-2023 Source: NMFS unpublished dealer data. [2]

Fishing year	Fed Quota (M lb)	Landings (M lb)
2000	4.0	8.1
2001	4.0	4.9
2002	4.0	4.7
2003	4.0	3.0
2004	4.0	1.3
2005	4.0	2.3
2006	4.0	6.6
2007	4.0	6.4
2008	4.0	8.9
2009	12.0	11.9
2010	15.0	14.4
2011	20.0	22.5
2012	35.7	26.8
2013	40.8	16.4
2014	49.0	22.8
2015	50.6	20.8
2016	40.4	25.0
2017	39.1	16.5
2018	38.2	17.6
2019	20.5	18.9
2020	23.2	13.3
2021	29.6	10.6
2022	29.6	12.6
2023	12.0	

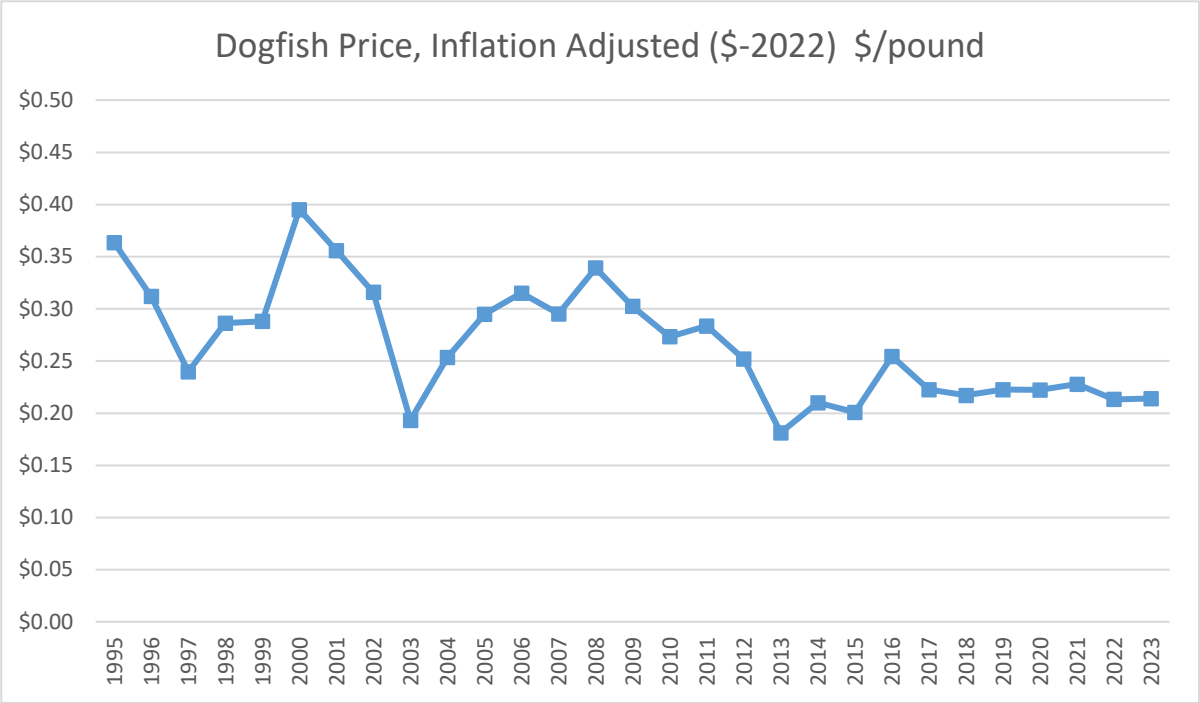

Figure 2. 1995-2023 fishing years' average prices of spiny dogfish in 2022 dollars per live pound (adjusted to "2022 dollars" using the GDP deflator). 2023 data is through early September only. Source: NMFS unpublished dealer data. [2]

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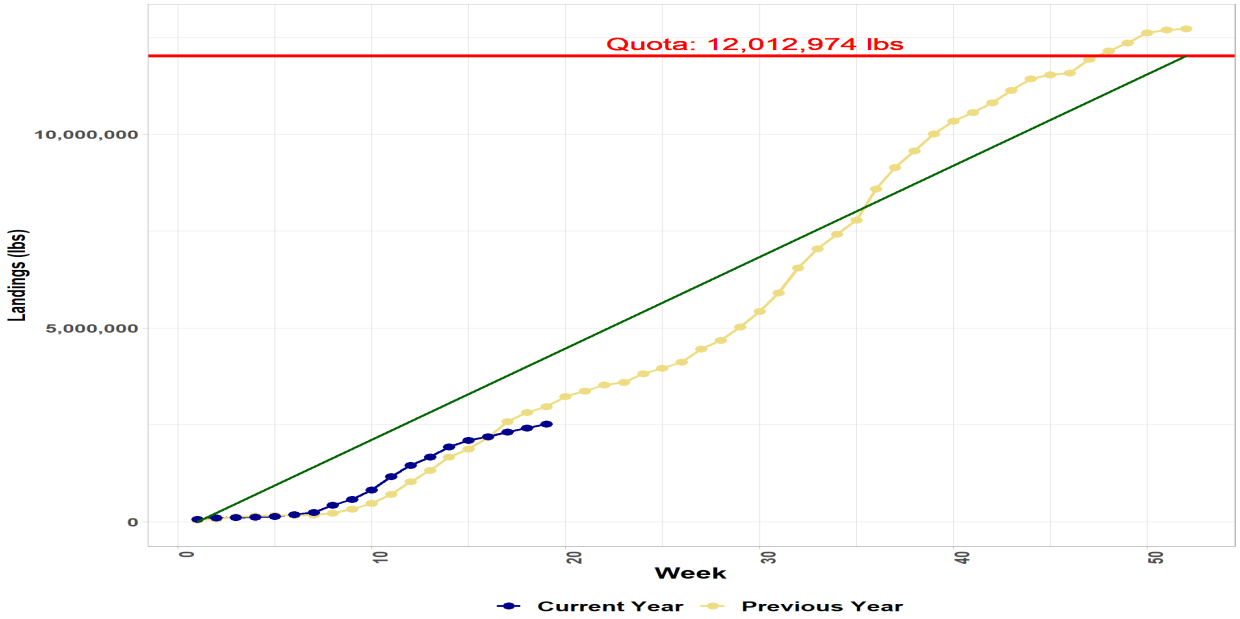

Figure 3. Preliminary Spiny dogfish landings; the 2023 fishing year (Starts May 1) is in blue (through September 13, 2023), and the 2022 fishing year is in yellow-orange. Source: https://www.fisheries.noaa.gov/new-england-mid-atlantic/commercial-fishing/quota-monitoring-greater-atlantic-region . [2]

Table 2. Commercial Spiny Dogfish landings (live weight – millions of pounds) by state for 2020-2022 fishing years. Source: NMFS unpublished dealer data. [3]

Year	MA	VA	NJ	Other (ME, NH, RI, CT, NY, MD, NC)	Total
2020	6.6	3.3	2.0	1.4	13.3
2021	3.8	4.0	1.6	1.2	10.6
2022	3.8	6.0	1.7	1.1	12.6

Table 3. Commercial Spiny Dogfish landings (live weight – millions of pounds) by months for 2020-2022 fishing years. Source: NMFS unpublished dealer data. [2]

Year	May-Aug	Sept-Dec	Jan-April	Total
2020	4.9	5.5	2.8	13.3
2021	2.9	4.6	3.1	10.6
2022	2.7	5.0	4.9	12.6

Table 4. Commercial Spiny Dogfish landings (live weight – millions of pounds) by gear for 2020-2022 fishing years. Source: NMFS unpublished dealer data. [2]

Year	GILL_NET_SINK__OTHER	LONGLINE__BOTTOM	TRAWL_OTTER_BOTTOM_FISH	Unknown/Other	Total
2020	9.7	1.8	0.4	1.4	13.3
2021	9.2	0.5	0.3	0.6	10.6
2022	10.1	0.9	0.2	1.3	12.6

Table 5. Participation in fishing years 2000-2022 by federally-permitted vessels. State-only vessels are not included. Source: NMFS unpublished dealer data. [2]

YEAR	Vessels 200,000+	Vessels 100,000 - 199,999	Vessels 50,000 - 99,999	Vessels 10,000 - 49,999	Total with at least 10,000 pounds landings
2000	16	10	8	43	77
2001	4	12	10	33	59
2002	2	14	8	31	55
2003	4	5	3	17	29
2004	0	0	0	42	42
2005	0	0	1	67	68
2006	0	4	11	114	129
2007	1	2	21	72	96
2008	0	5	20	119	144
2009	0	11	42	166	219
2010	0	26	54	124	204
2011	1	48	73	135	257
2012	25	55	56	146	282
2013	10	27	45	87	169
2014	27	38	38	81	184
2015	31	33	36	59	159
2016	52	26	14	45	137
2017	28	27	24	32	111
2018	28	26	20	35	109
2019	29	25	21	29	104
2020	23	27	15	22	87
2021	15	27	11	26	79
2022	28	9	14	29	80

References

[1] Stehlik, Linda. 2007. Essential Fish Habitat source document: Spiny Dogfish, *Squalus acanthias*, Life History and Habitat Characteristics. NOAA Technical Memorandum NMFS-NE-203; 52 p.

[2] Unpublished NMFS dealer and/or Vessel Trip Report data.

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EAST COAST SEAFOOD, LLC
SEATRADE INTERNATIONAL

November 14, 2023

Dr. Christopher Moore
Executive Director
Mid-Atlantic Fishery Management Council
800 North State Street, Suite 201
Dover, DE 19901

Re: Spiny Dogfish Quota 2024-26

Dear Dr. Moore:

I am the Chief Executive Officer of East Coast Seafood, LLC also known as Seatrade International. Seatrade is one of the original commercial dogfish processors and marketers of Spiny Dogfish dating back to the 1980's under the leadership of Steve Barndollar. I became affiliated with Seatrade in 1992 and have experienced the growth and slow demise of the industry. The industry has failed to attract any domestic interest in the species, the government has no purchase program, ocean carriers have refused to carry our cargo, governments have attempted to ban Spiny Dogfish, and there are fewer and fewer fishermen and offloaders with each passing season. To say the least, the fishery is very challenging.

As an original, and only remaining stakeholder in the sustainable certification of Spiny Dogfish, we are very supportive of sustainability measures. However, we need to keep in mind that we are protecting a predator and a nuisance fish formerly referred to as a "trash" fish, that if left unchecked will have a negative impact on North Atlantic fisheries. Nobody wants Dogfish to become extinct, but nobody should want the industry to become extinct either. The demise of the fishery will create new management concerns for the Councils as they attempt to find a way to compensate fishermen to harvest Dogfish to allow other species to flourish. Although dogfish is not a huge fishery, its extinction by implementing an unnecessarily low commercial quota would impact fishermen and fish houses from NH to NC, a New Bedford workforce, and many ancillary services including freezer, packaging, and transportation.

I do not believe that the science is as sound as the Science and Statistical Committee would have us believe. The Bigelow continues to fail to complete its surveys, observers tasked with measuring fish are spotty at best due to financial constraints, and the scientists are not surveying other areas like the Gulf of Maine. We hear from trawlers that vessels are forced to cut nets or move to in order to find targeted groundfish.

We recommend that the Dogfish committee put additional measures in place to increase the confidence in the science and Seatrade is pleased to assist in any way that we can. You should require additional surveys, including off the coast of Maine. The Committee should also require observers inspect dogfish one day per month at the only remaining production facility to measure fish, as this is the most efficient, cost effective and reliable means of completing this task. As previously mentioned, we are happy to make available our internal graded dogfish back reports that do not corroborate a measurable decline in the size of the species. We should work together on the possibility of a seasonal male dragger fishery to reduce the male population and sustain the industry. And jointly work on a government purchase program that will increase the price paid to fishermen.

As far as the quota is concerned, we are not asking the Committee and Councils to ignore that science that has been presented but use its powers to adopt certain measures that will give the industry a fighting chance. First of all, you can adopt a projected discard of 2,134 MT. The Science and Statistical Committee claims with certainty that the ABC is 7,135 MT but that 2023 discard projection of 2,088 MT could be understated!?

Secondly, you can adopt a management buffer of zero, as there are inherent buffers built into the fishery. It's impossible to catch 100% of the quota, with the quota divided between the north and south and then subsequently divided again by state. It's unrealistic to think that each state will either catch or relinquish its entire quota. We have also heard that there is instability with the loss of the largest offloader in the South and uncertainty if there is going to be a successful successor. In addition, it's unlikely that we will catch the 2023 TAL of 5.449 MT. Because of the inherent buffer, we were never expecting to catch the quota and currently anticipating a 2023 harvest of ~4,700 MT, barely enough for the industry to survive. With a TAL of 4,852 I expect a final harvest in the vicinity of 4.300 MT. And this leads me to my final observation, doesn't the balance add to the 2024 buffer?

In summary, I am asking the Councils to make the best of a bad situation by using its available powers to maximize the 2024 harvest by minimizing discard projection, adopting a zero buffer and consider rolling over remaining quota.

I would like to thank all of the members and councils for their dedication and service to US fisheries.

Sincerely

Bob Blais
Chief Executive Officer

Cc: Dr. Cate O'Keefe, Executive Director New England Fisheries Management Council
Sonny Gwin, Chair Joint Spiny Dogfish Committee Mid-Atlantic Fisheries Management Council
Nichola Meserve, Vice Chair New England Fisheries Management Council
Eric Reid, Chair NEFMC
Wes Townsend, Chair MAFMC