



# Northern Shrimp Assessment Update

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Dec. 12, 2024

# Outline



- Data
- Results
- Projections

# Data Updates

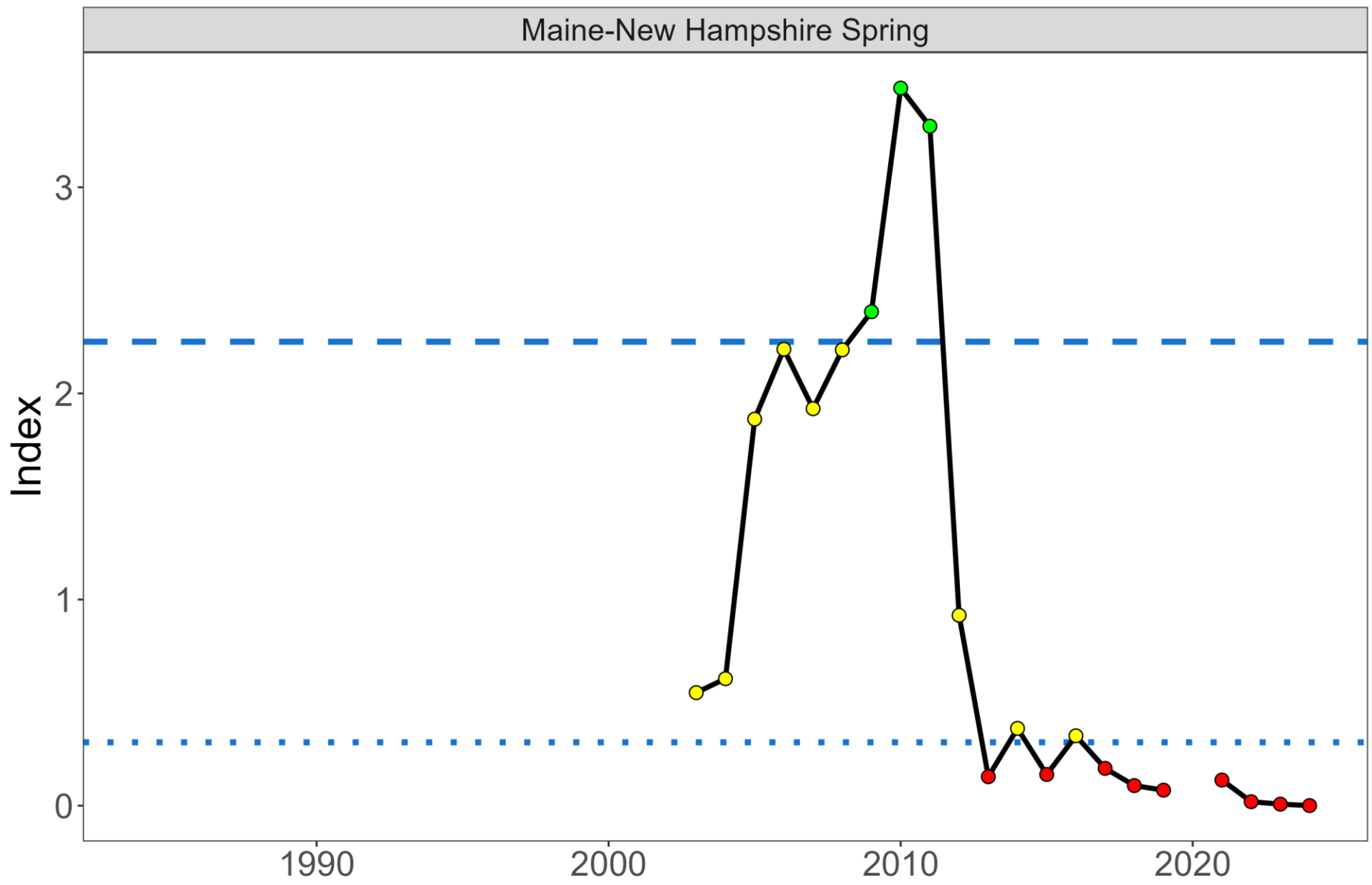


- Previous full assessment update: 1984-2021
- 2024 data: ME-NH spring trawl survey
- 1984-2023 data: same as 2023 data update
  - Summer Survey: 1984-2023
  - NEFSC Fall: 1986-2022 (have not been able to process shrimp for 2023 due to staffing limitations)
- No new catch data for 2022-2024

# ME-NH Spring Survey



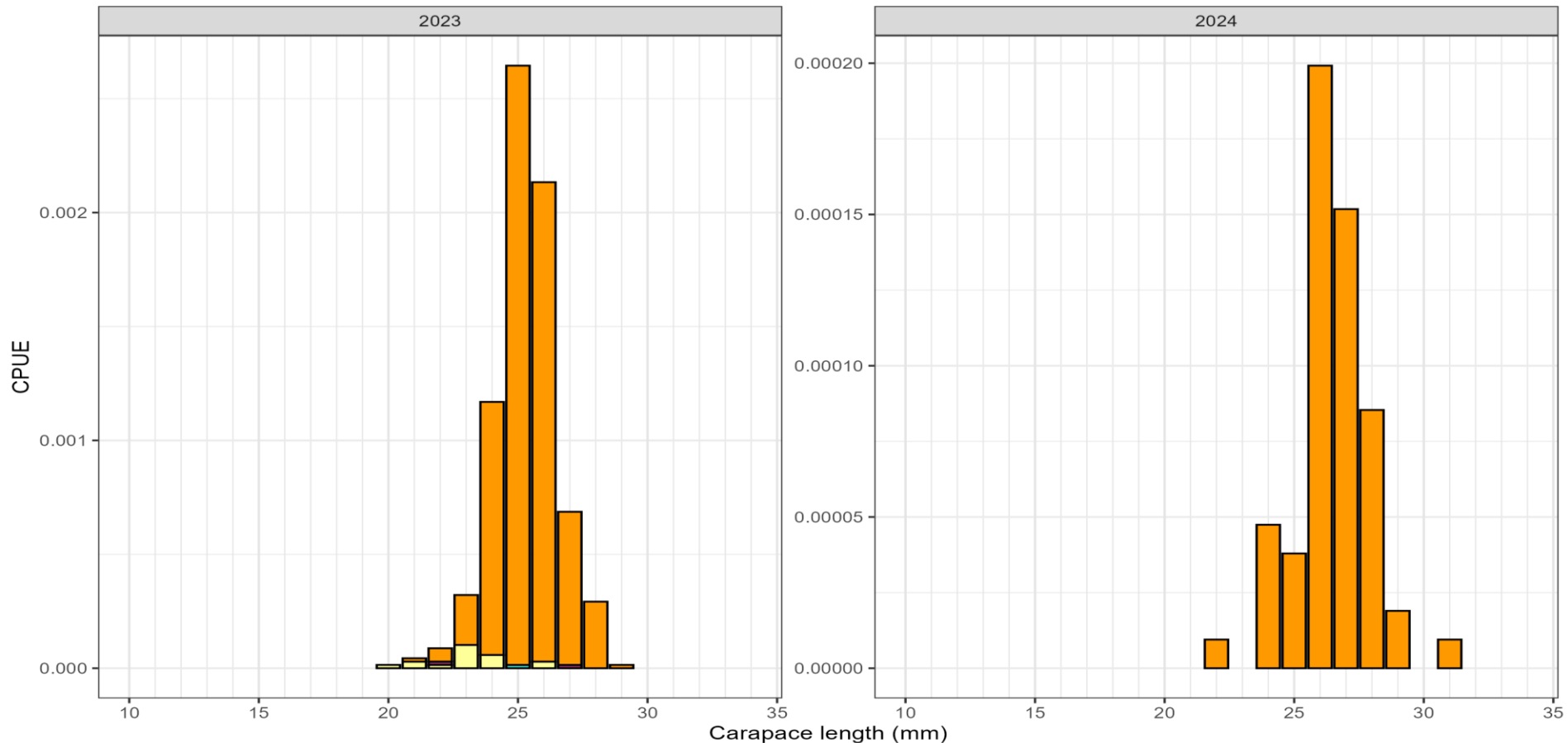
Maine-New Hampshire Spring



# ME-NH Spring Survey



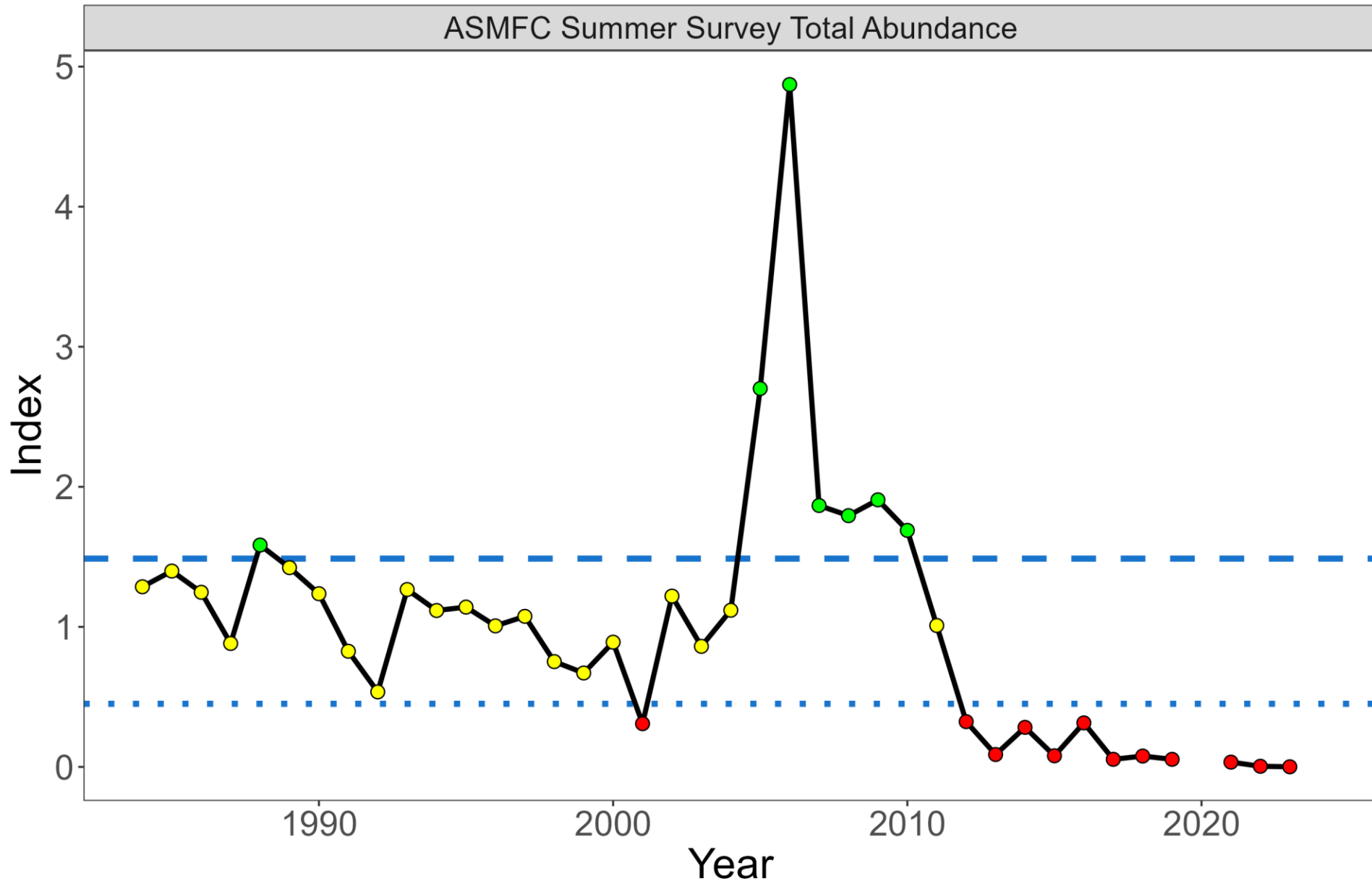
- Only Female 2s in 2024, no small shrimp



# ASMFC Summer Survey



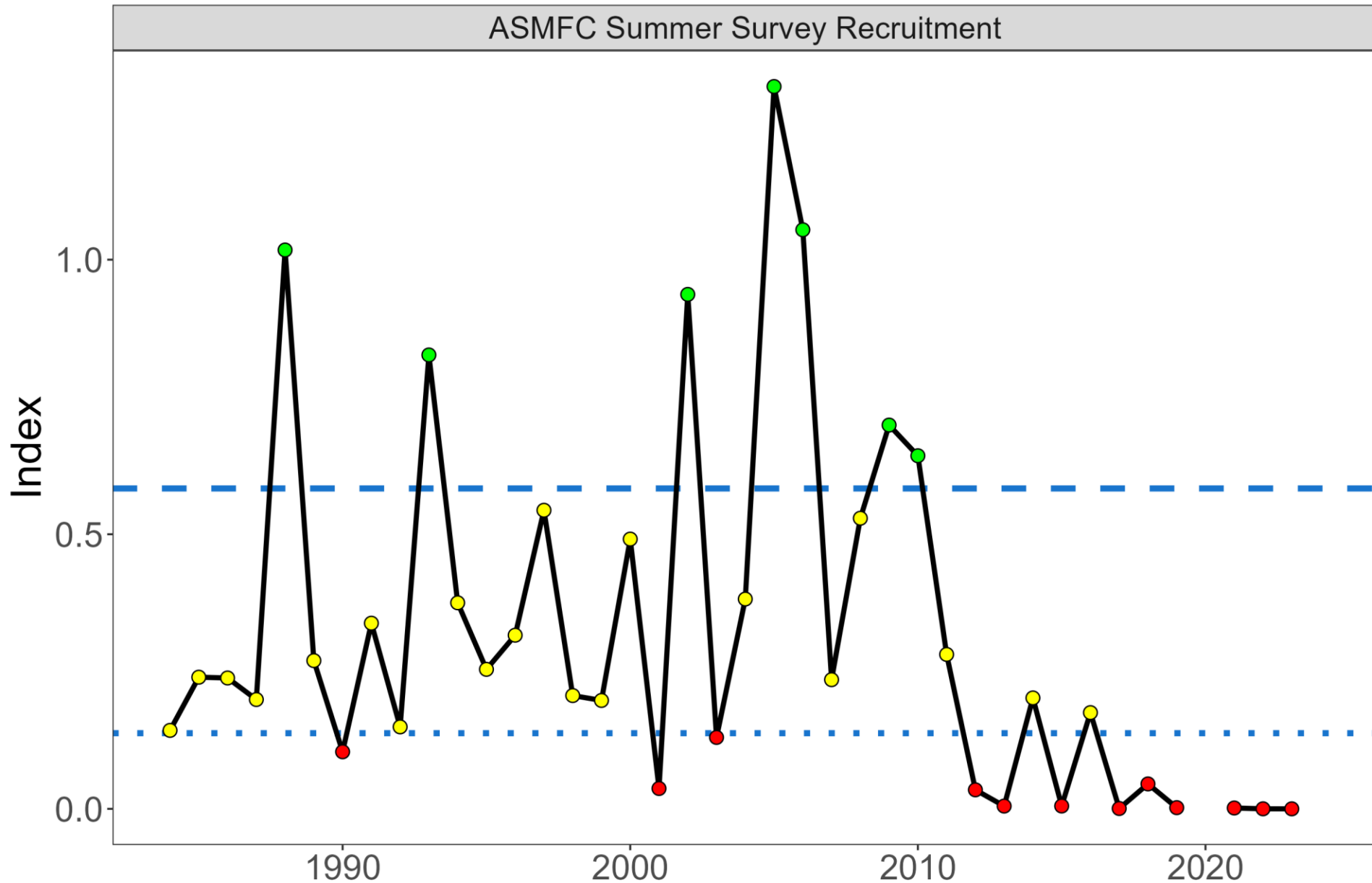
ASMFC Summer Survey Total Abundance



# ASMFC Summer Survey



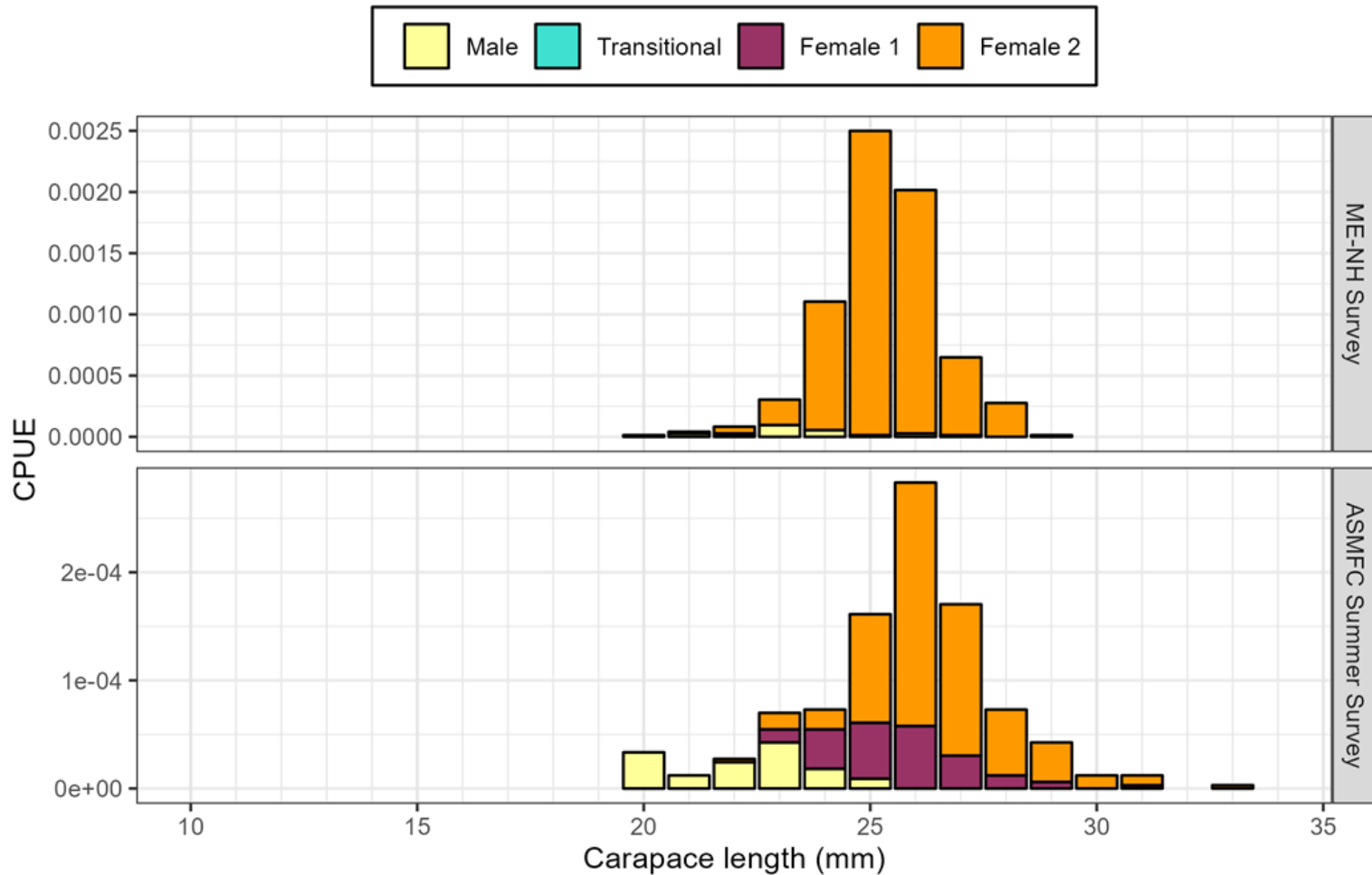
ASMFC Summer Survey Recruitment



# 2023 Size Comps



- No shrimp less than 20mm in either survey

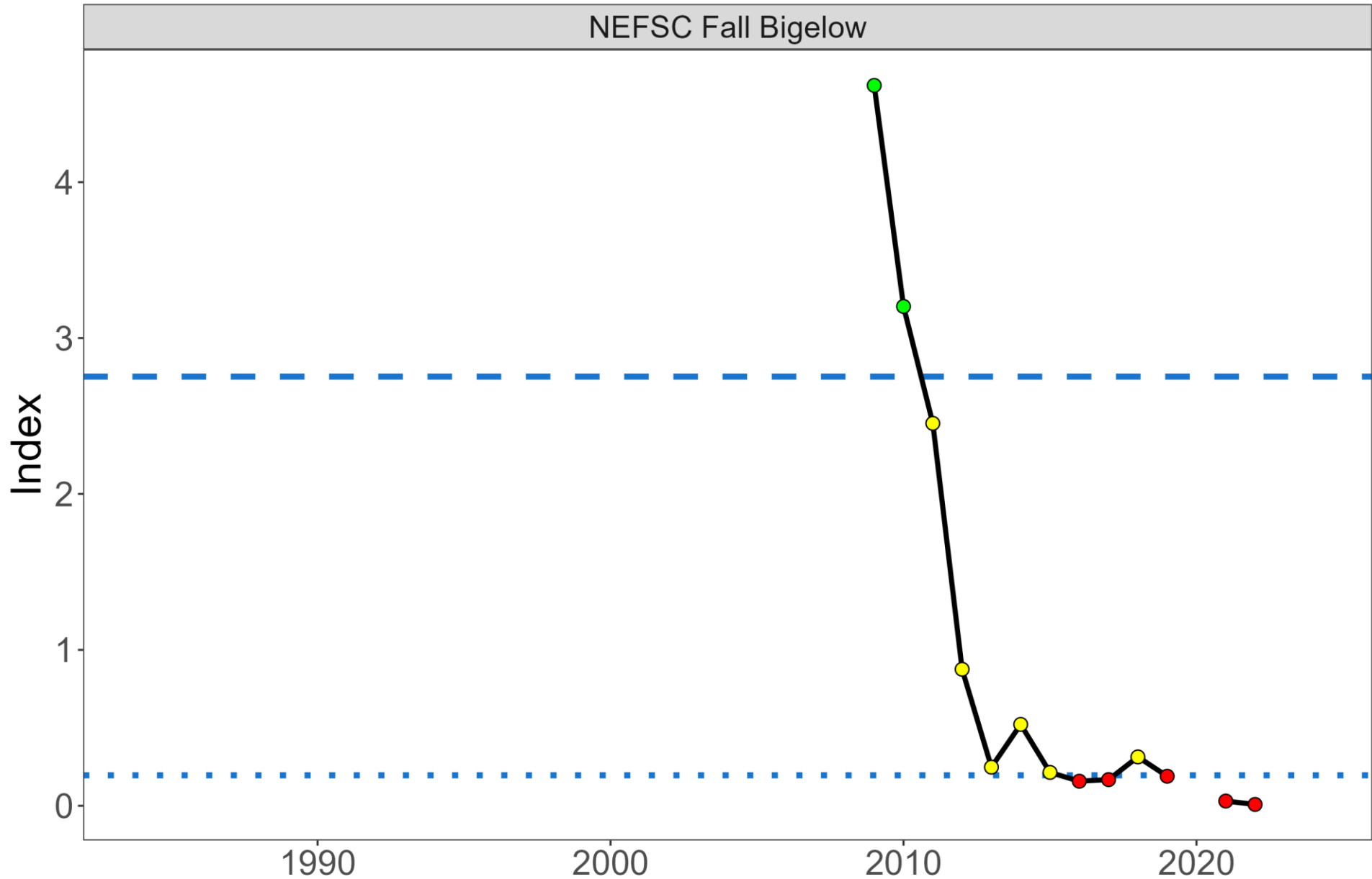




# NEFSC Fall Survey



NEFSC Fall Bigelow



# PPI Update

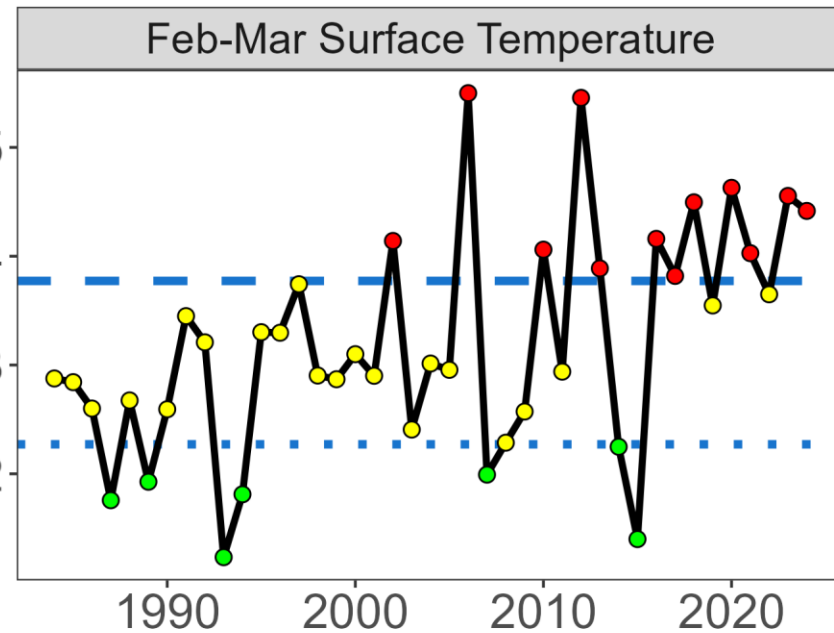
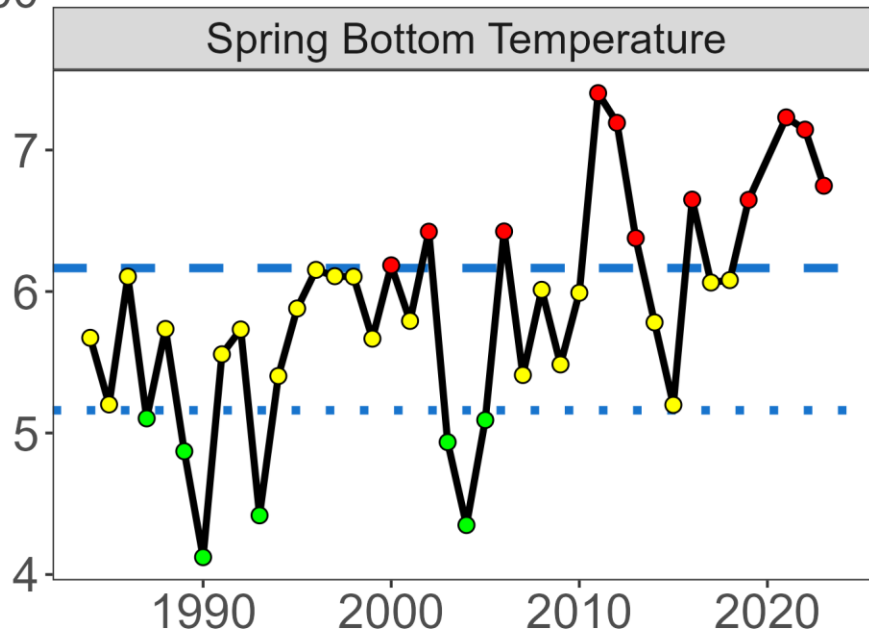
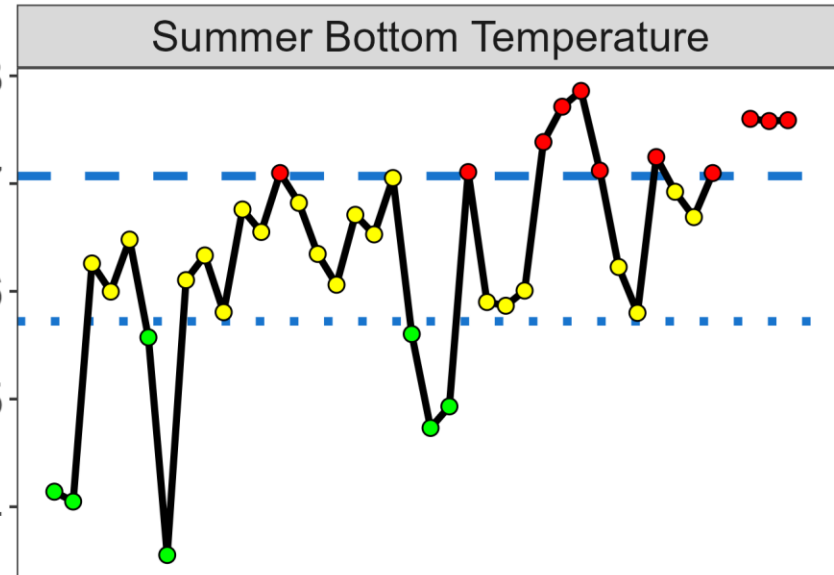
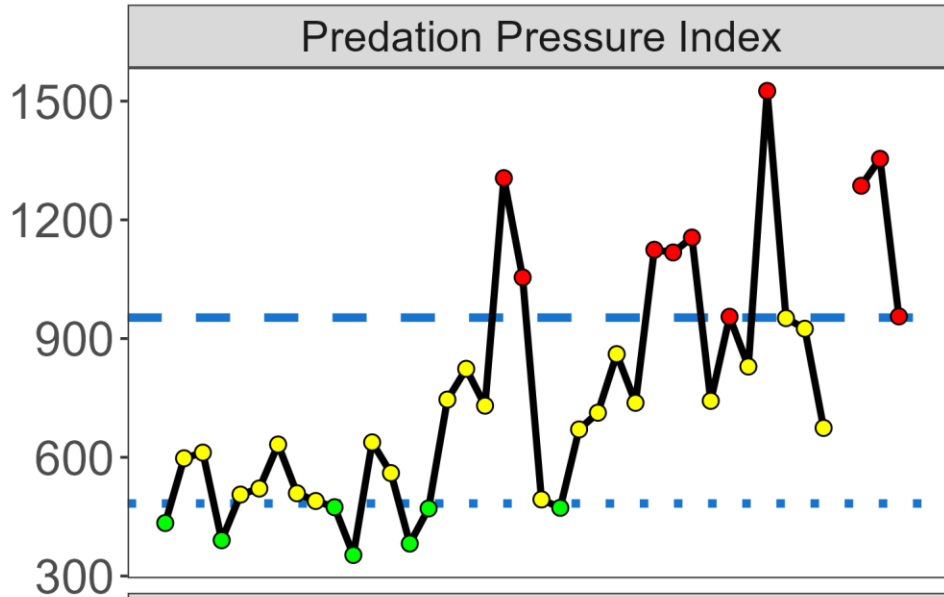


- Used the publicly available datasets to recreate the stratified mean biomass indices for PPI species
- Very similar results to previous PPI
- TC will be able to develop the index without NEFSC support in the future

# Environmental TLA



Indicator



# UME Model

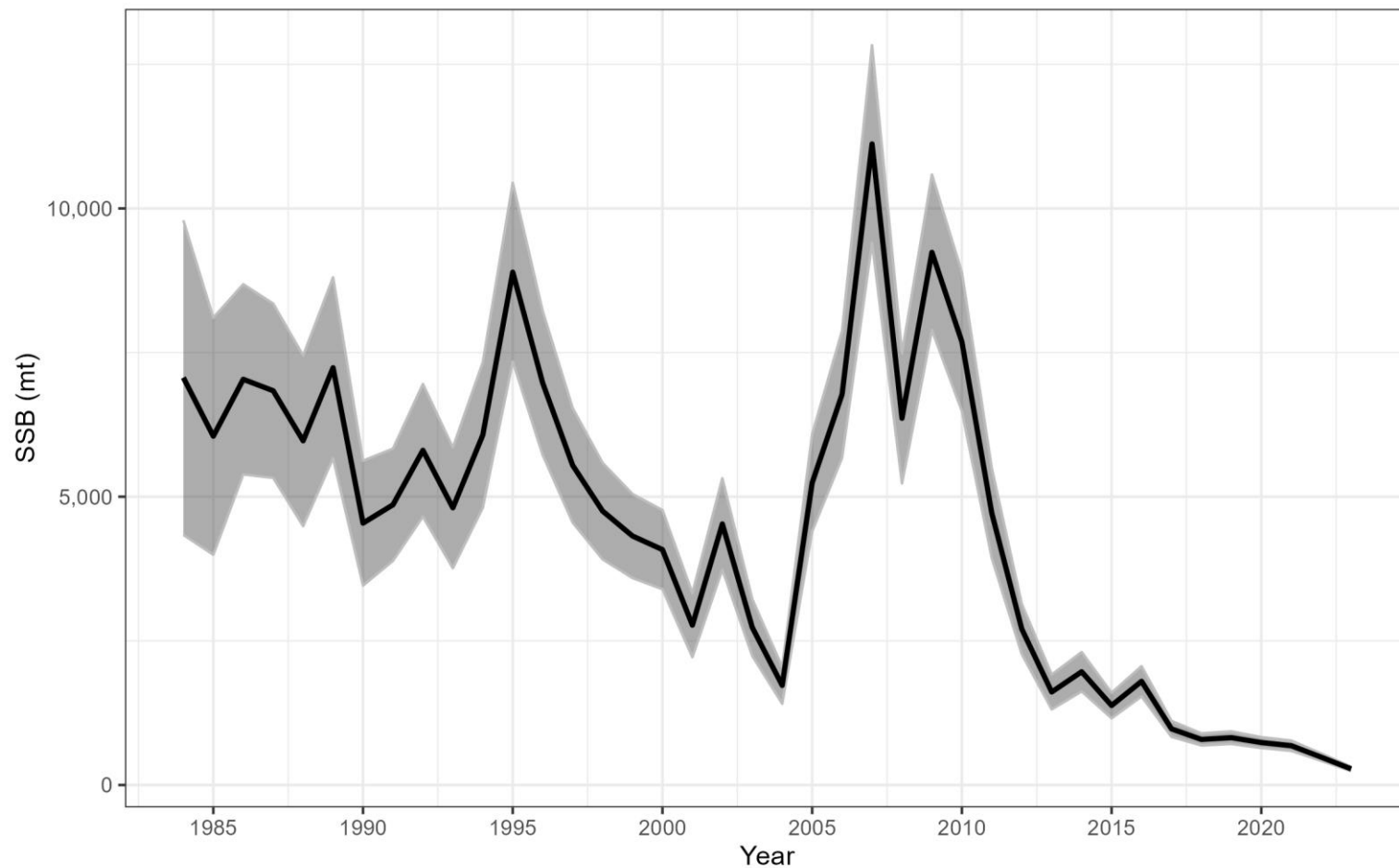


- Due to limited data for 2024, NSTC used 2023 as the terminal year of the assessment
  - Most robust estimate of population size
- Used the ME-NH index in the base run, which will be necessary in future updates
  - Make comparisons with future updates easier

# Model Results: SSB



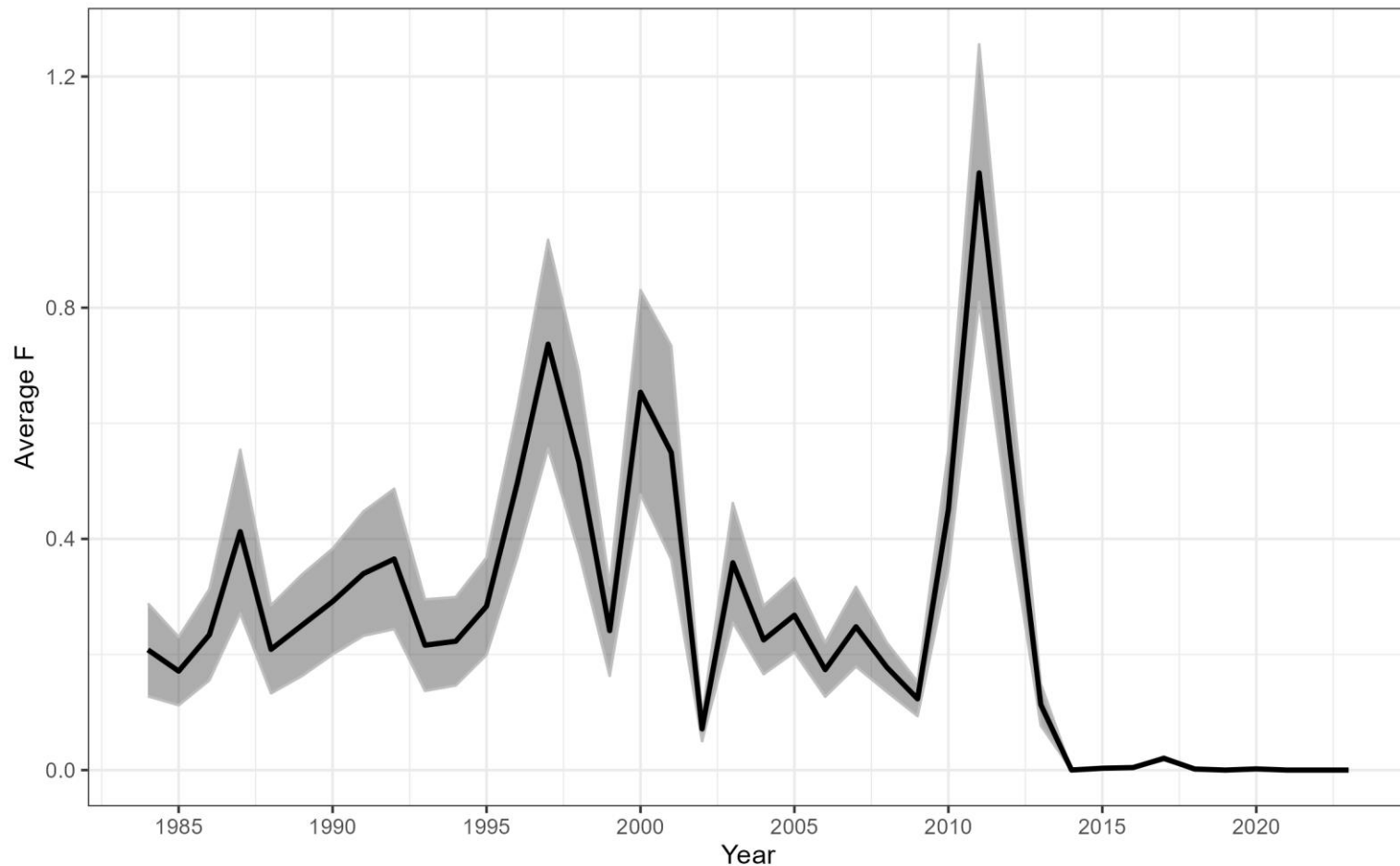
- SSB at very low levels, with continued decline from 2021



# Model Results: F



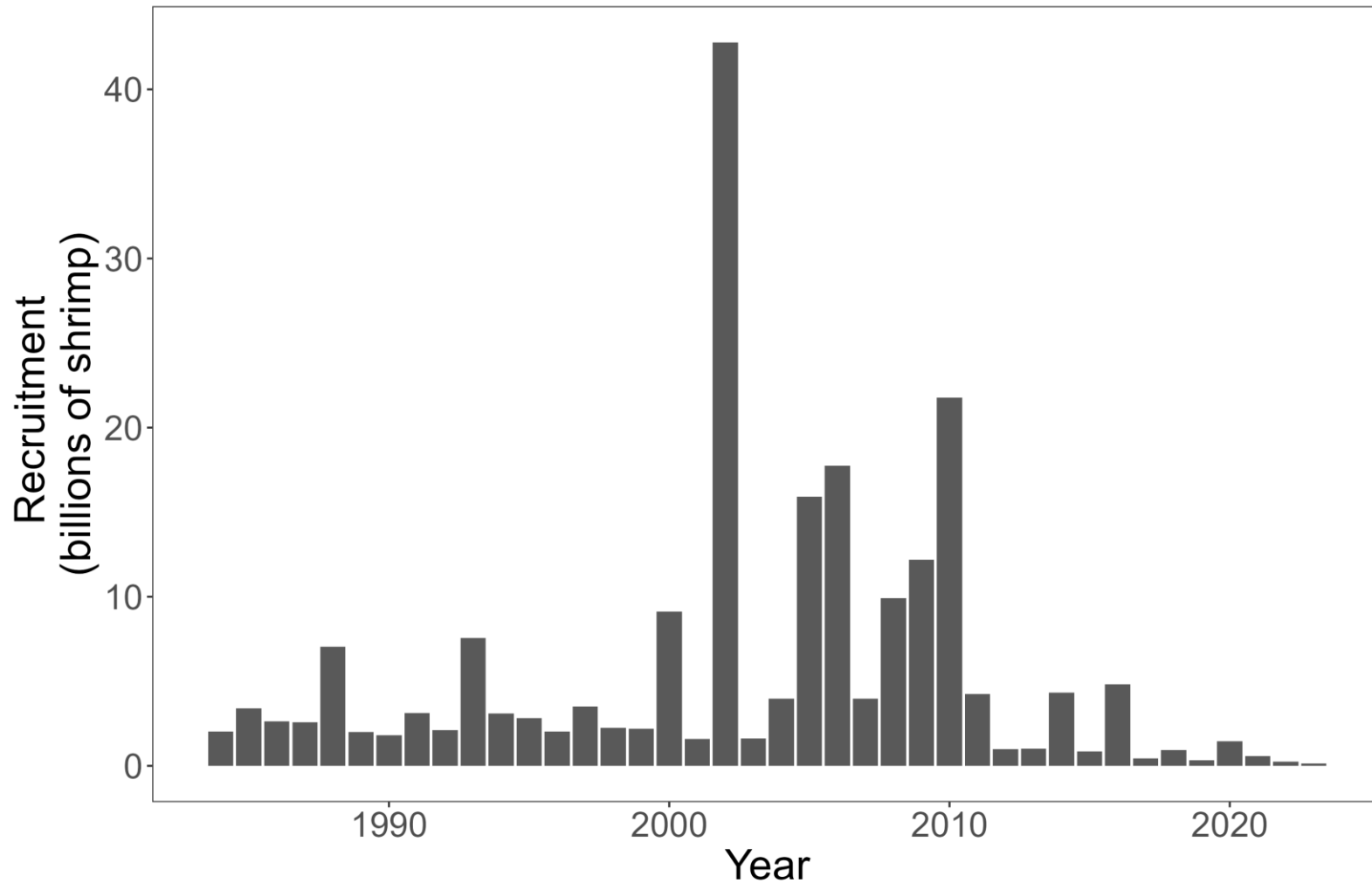
- F at very low levels with zero catch in recent years



# Model Results: R



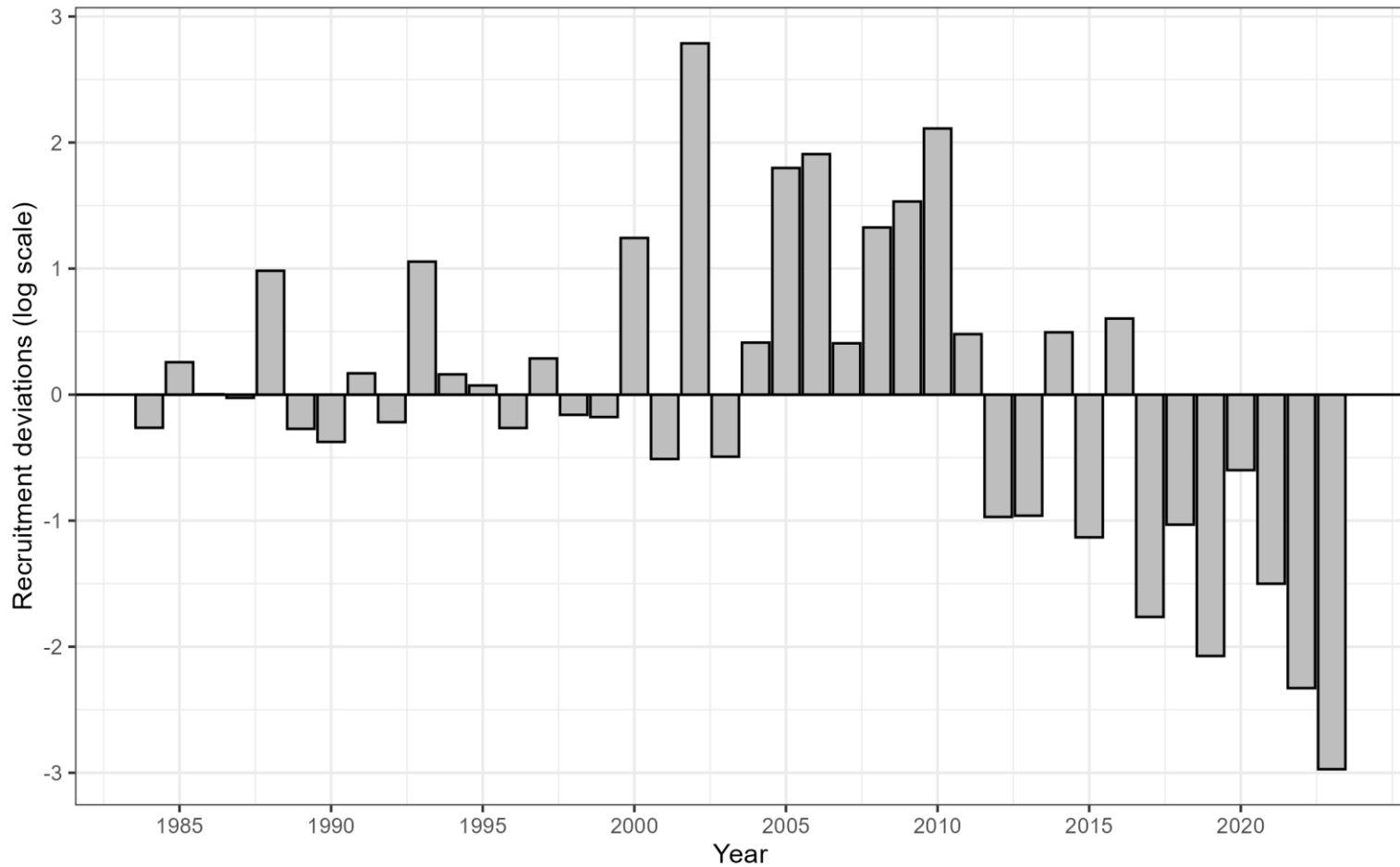
- Recruitment at very low levels in recent years



# Model Results: R



- Recruitment deviations vary more since 2000

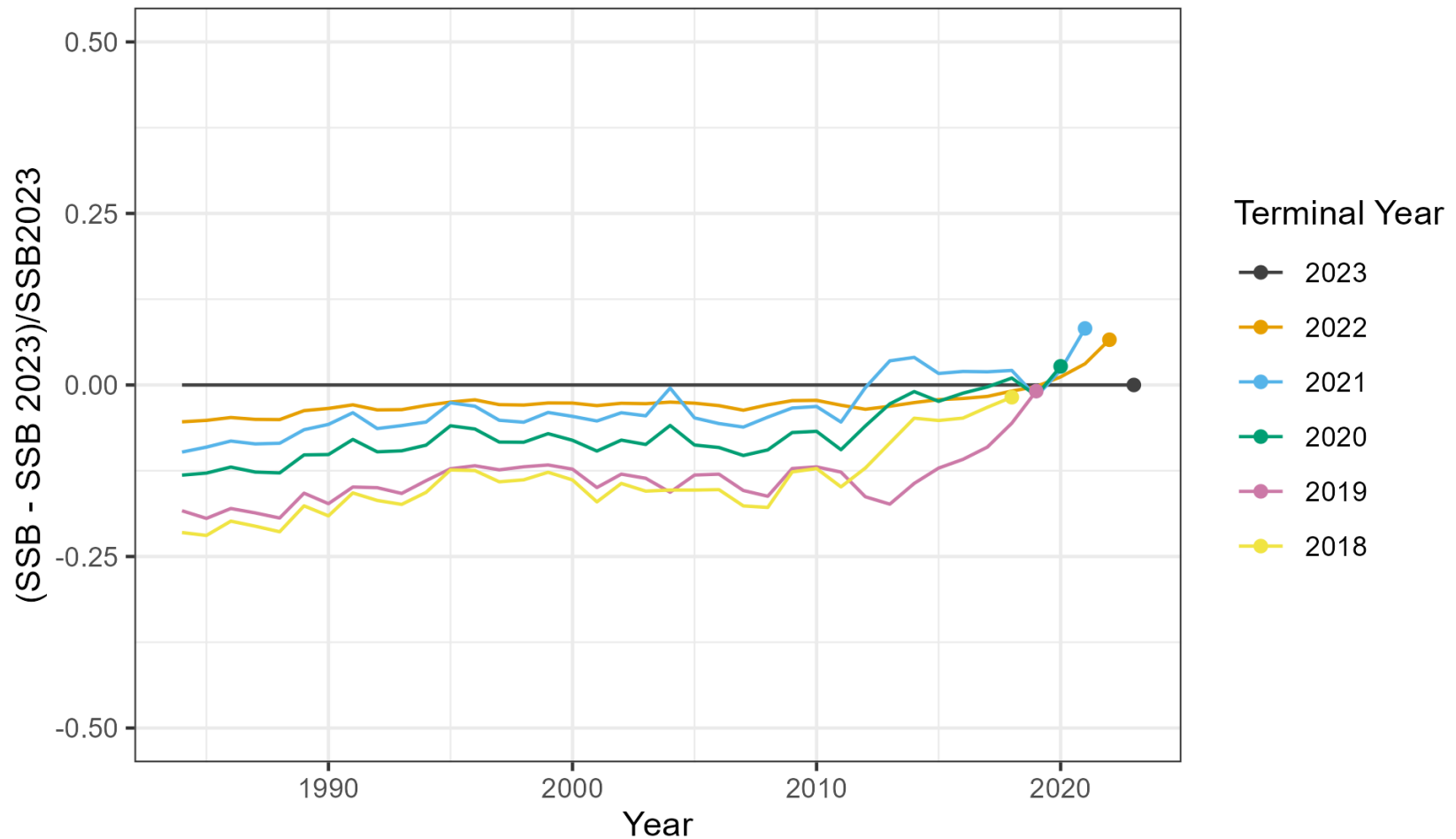




# Retrospective Analysis



- SSB is overestimated in recent years

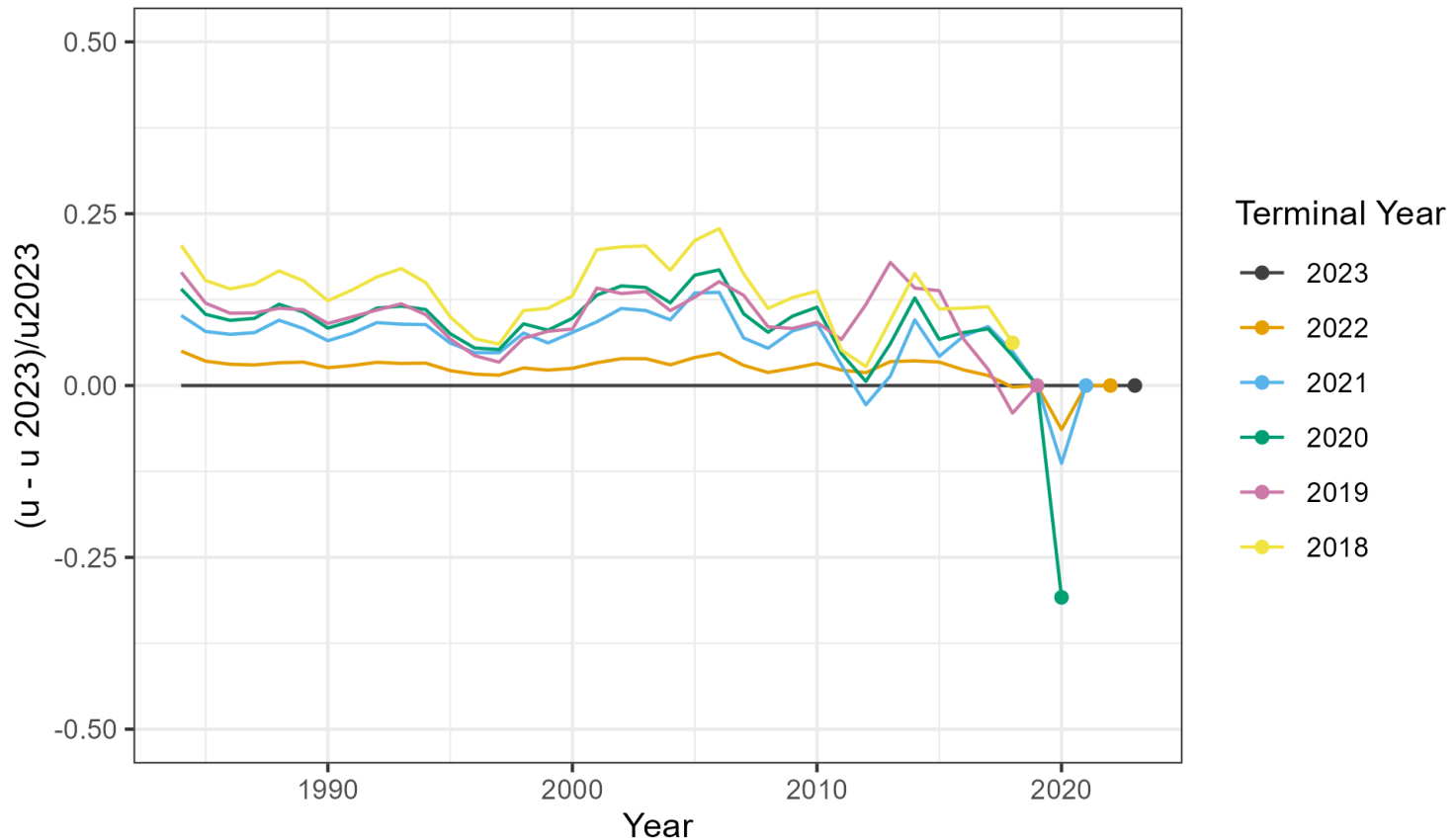


Mohn's rho = 0.025

# Retrospective Analysis



- F is underestimated in recent years (when there were removals)

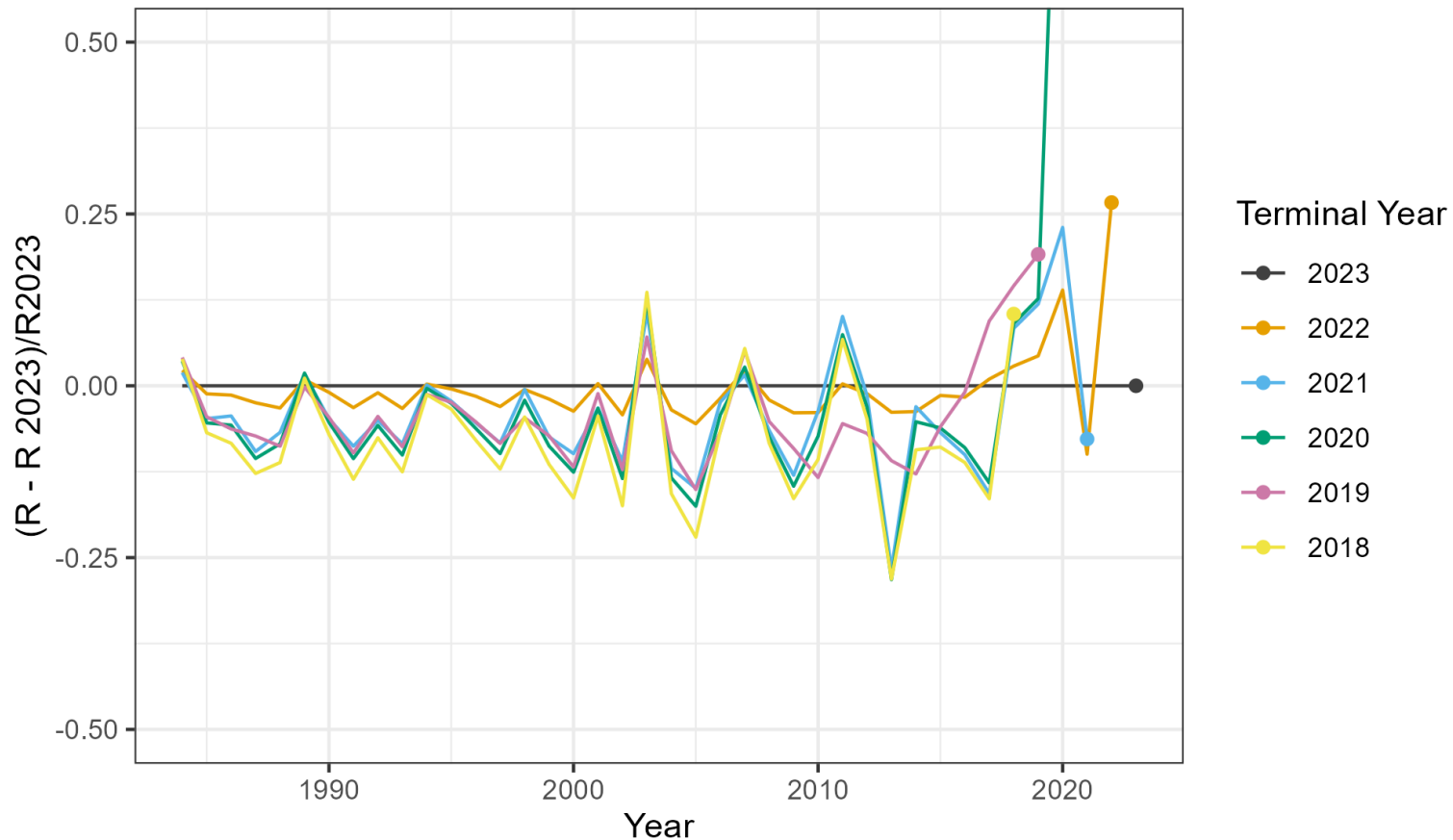


Mohn's rho = -0.041

# Retrospective Analysis



- Recruitment is more variable but generally overestimated in recent years



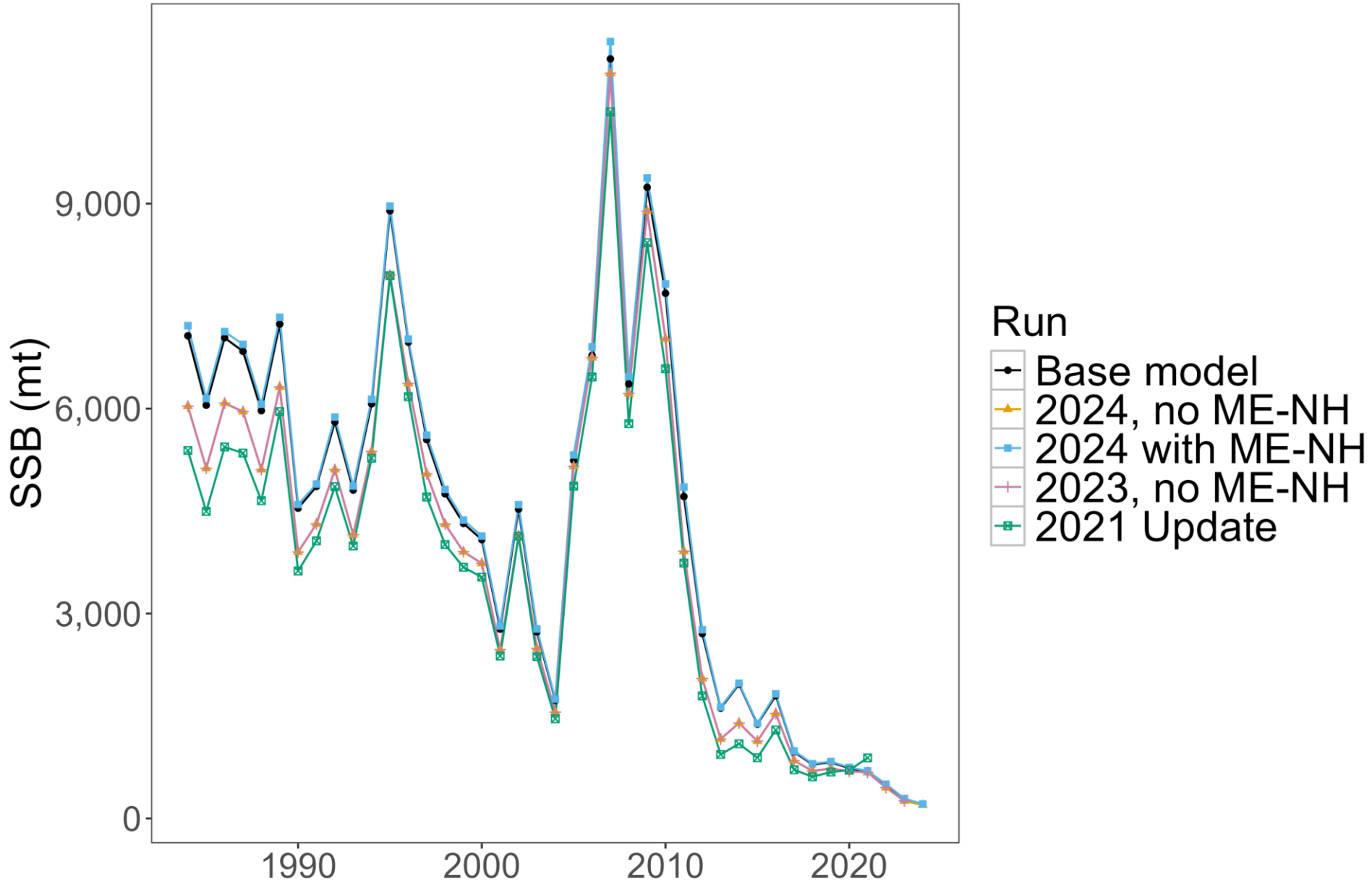
Mohn's rho = 0.265

# Model Comparisons

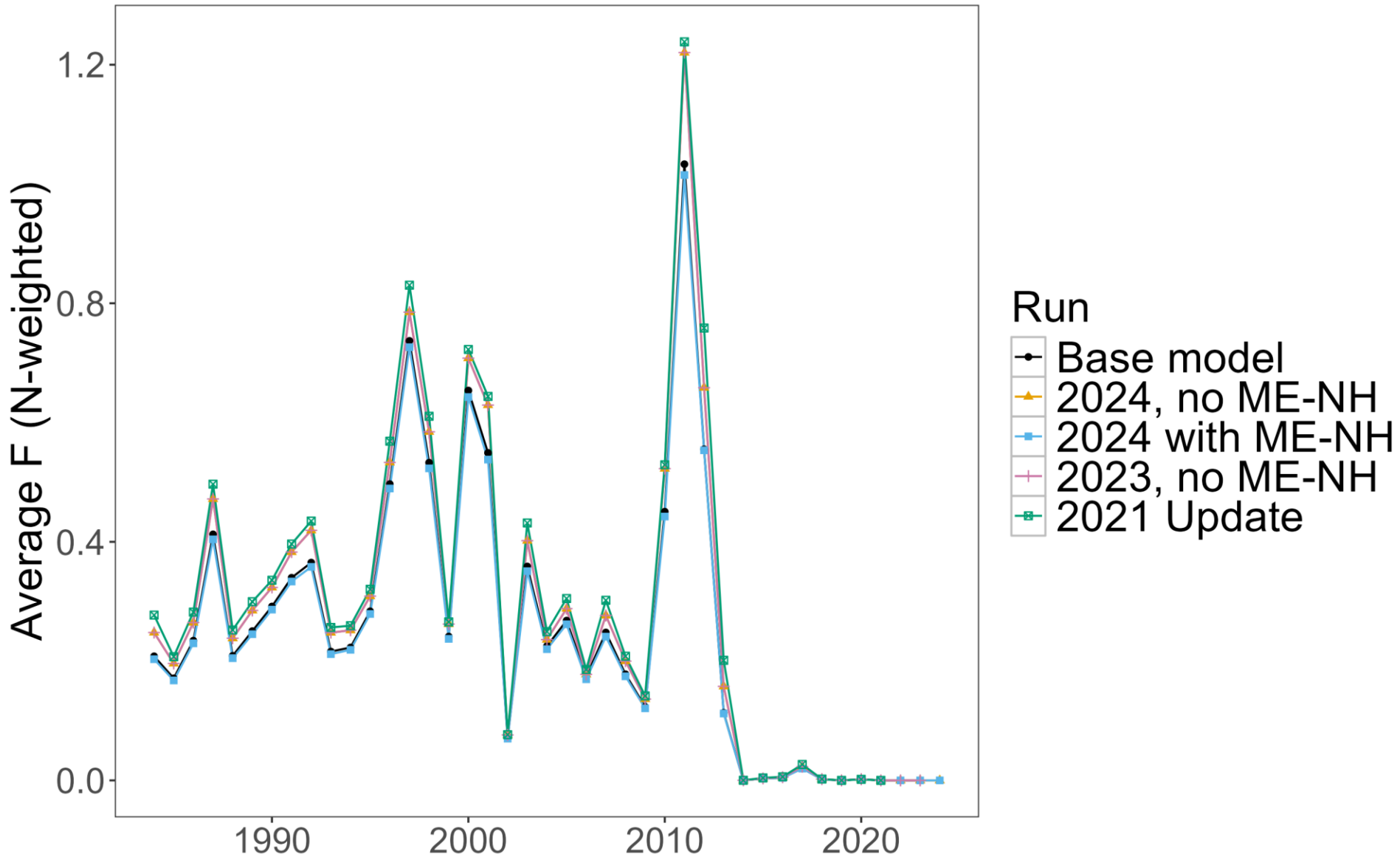


- Including ME-NH results in a slightly higher SSB and a slightly lower F over the time-series, but trends in recent years are very similar
- Without ME-NH in 2024, the model has no observations about recruitment and estimates recruitment at the time-series median
- With ME-NH, the model estimates low recruitment in 2024

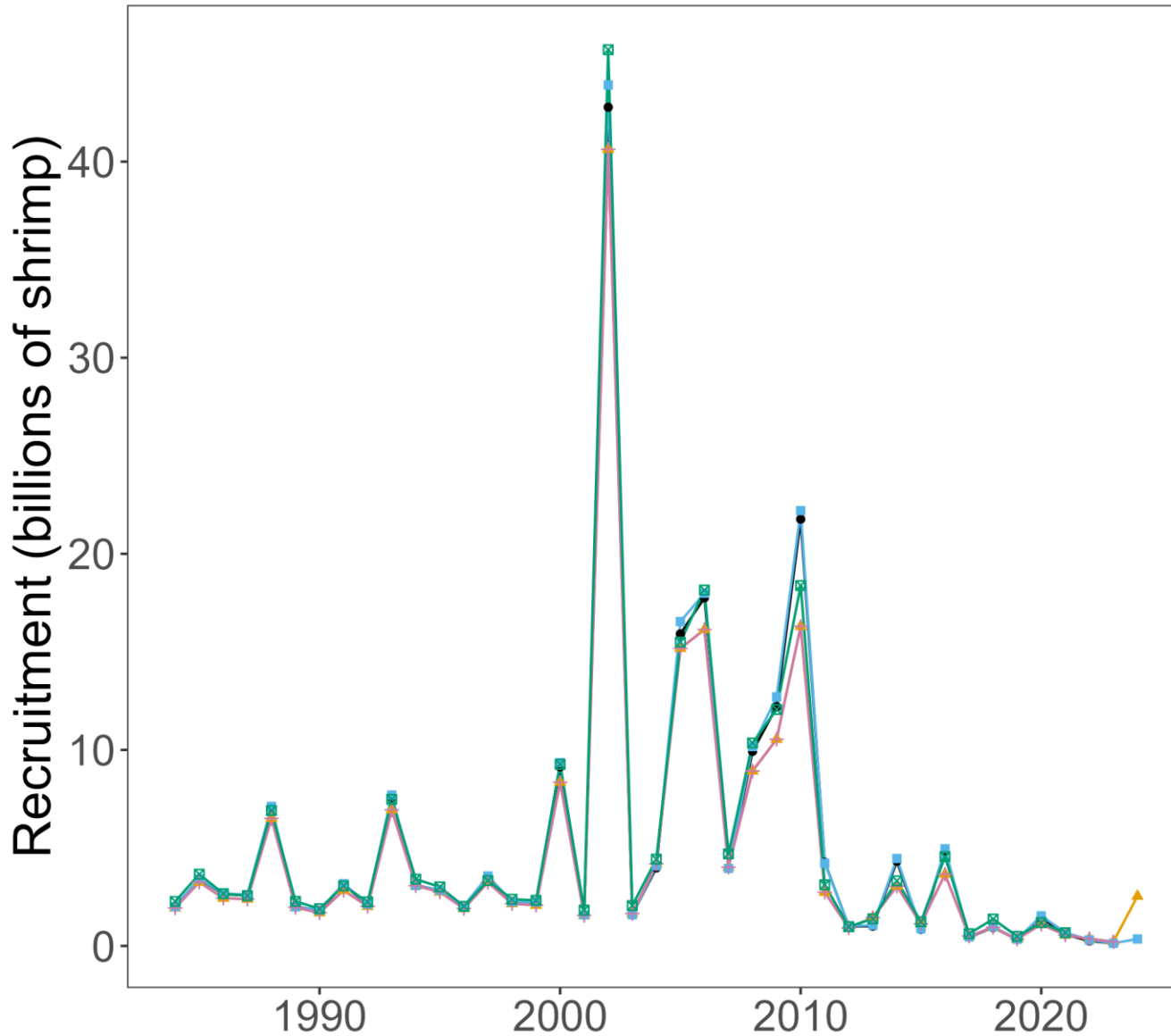
# Model Comparisons



# Model Comparisons



# Model Comparisons



## Run

- Base model
- 2024, no ME-NH
- 2024 with ME-NH
- 2023, no ME-NH
- 2021 Update

# Stock Status



- Northern shrimp in the Gulf of Maine remain depleted, with SSB in 2024 estimated at 279 mt, the lowest in the time-series
- Recruitment continues to be low, with the 2022 and 2023 year-classes being the lowest in the time series
- Environmental conditions remain unfavorable, with high predation levels and high water temperatures
- Fishing mortality has been very low in recent years due to the moratorium, but high  $M$  and low recruitment have hindered rebuilding



# Stock Status

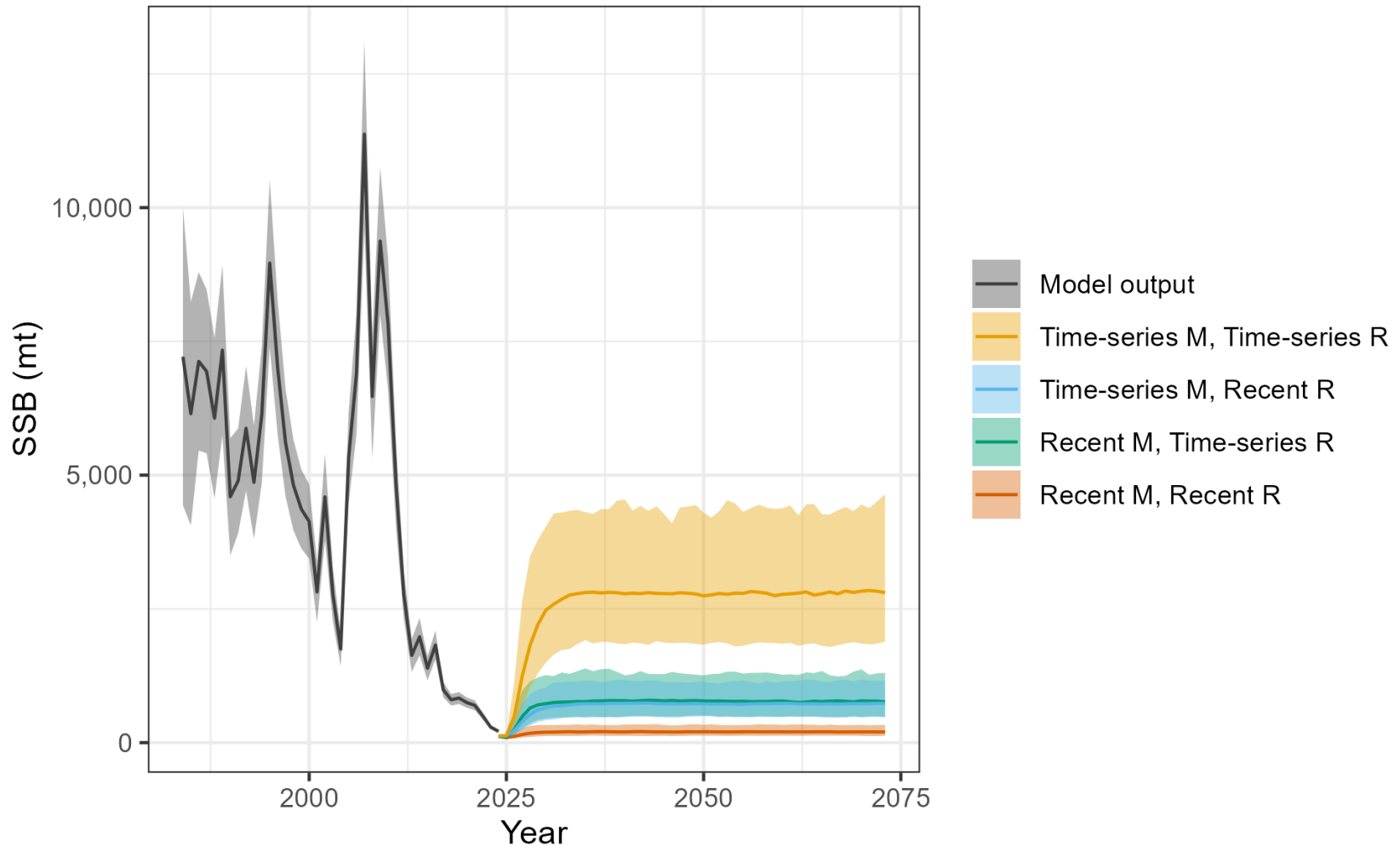


- NSTC recommends that the Section extend the moratorium on fishing
- NSTC is not opposed to a limited winter sampling program

# Long-Term Projections



- SSB stabilizes at low levels under current conditions



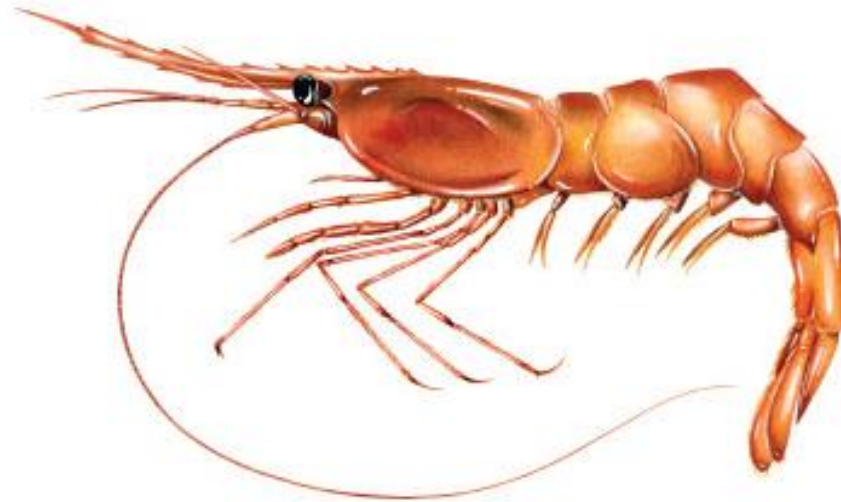
# Short-Term Projections



- SSB is projected to decline in 2025 even at  $F=0$
- Any increase in  $F$  in 2025 results in lower SSB, but the reduction is small for low levels of catch

Year	F Rate	Catch	Probability that $SSB_{2025} > SSB_{2023}$	SSB (mt)	Change in SSB from 2023	Change in $SSB_{2025}$ Compared to $F=0$
2025	$F = 0$	0 mt (0 lbs)	0%	127.4	-54%	--
2025	$F = 0.01$	0.5 mt (1,120 lbs)	0%	127.2	-54%	-0.2%
2025	$F = 0.03$	3.2 mt (7,092 lbs)	0%	126.5	-55%	-0.7%
2025	$F = 0.07$	6.7 mt (14,755 lbs)	0%	125.4	-55%	-1.6%
2025	$F = 0.14$	13.8 mt (30,408 lbs)	0%	123.4	-56%	-3.1%
2025	$F = 0.36$	32.5 mt (71,699 lbs)	0%	117.6	-58%	-7.6%
2025	$F = 0.63$	53 mt (116,881 lbs)	0%	110.6	-60%	-13.1%

# Pilot Winter Sampling Program and 2025 Specifications



Northern Shrimp Section

December 2024

- Technical Committee Pilot Winter Sampling Program Proposal Overview
- Advisory Panel Discussion on Pilot Winter Sampling Program Proposal
- Formulate Recommendations for 2025 Northern Shrimp Specifications

- September 2024 – Northern Shrimp Section tasked the Technical Committee to:
  1. Develop an RSA quota and pilot winter sampling program for Section consideration at the Winter 2024 meeting (to be implemented in 2025)
  2. Explore the potential for and effort required of participants for a summer shrimp survey (second priority task, to be explored by Technical Committee in 2025)

# Pilot Winter Sampling Program Proposal

- Technical Committee (TC) met three times between September and December 2024 to develop program and complete stock assessment update
- TC agreed the program should run in a similar fashion to the previous 2014-2017 research fishery
  - This time, not seeking to gather information on egg hatch timing to provide more opportunities for participants
  - Program will be self-funded by participants
- Program Goal: Collect samples similar to those that might have been collected from commercial shrimp catches if there was a fishery



- Industry members from Maine and Massachusetts have expressed interest
- TC recommends using previous sampling regions and participant selection criteria
- Program regions (1-2 trawlers per region):
  - Massachusetts-New Hampshire
  - Western Maine (Kittery to Phippsburg)
  - Midcoast Maine (Phippsburg to Monhegan Island)
  - Eastern Maine (east of Monhegan Island)
- TC recommends selection of 1-4 trappers (locations TBD)



# Participant Selection Criteria

- Participants should have demonstrated expertise fishing for shrimp
- Maintain the use of size-sorting grates for trawls
- During each trip, captain should attempt to fish in locations where he/she would previously fish for shrimp

# Participant Expectations

## Trawls:

- For each tow, the captain should record:
  - Date
  - Tow number
  - GPS coordinates of tow
  - Tow start time and duration
  - Depth (fathoms)
  - Description of the size-sorting grate
  - Estimate of the number of pounds of shrimp caught

## Traps:

- For each fishing trip, including those where no samples are collected, the captain will record:
- Date
  - Number of traps in the string
  - GPS coordinates
  - Number of set-over-days
  - Depth (fathoms)
  - Estimate of the number of pounds of shrimp caught

# Trip Limits and Trap Limits

- Program is intended to run from January-March 2025 or until the RSA quota is reached, whichever is sooner
- Trip limits, trap limits, and number of traps can not be determined until an RSA quota is selected

# RSA Quota Recommendation

- **TC recommends an RSA quota between 0 and 6.7 mt**
- Quota recommendations based on 2024 stock assessment update projections:

Year	F Rate	Catch	Probability $SSB_{2025} > SSB_{2023}$	SSB (mt)	Change in SSB from 2023	Change in $SSB_{2025}$ Compared to F=0
2025	F = 0	0 mt (0 lbs)	0%	127.4	-54%	--
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2025	F = 0.63	53 mt (116,881 lbs)	0%	110.6	-60%	-13.1%

# AP Report: Sampling Program

- Locations may need to be altered depending on interest in the program
  - Advisors do not believe Monhegan is a good dividing point
- Advisors believe the TC's recommendation of a 6.7 mt (14,755 lbs) RSA quota is too small
  - Need a larger RSA to make it worth it for participants
  - The risk is worth the higher RSA – no specific RSA recommendation
  - Previous program trip limit of 1,200 lbs and trap limit of 500 lbs could work
  - Largest past RSA quota (2017) → 53 mt (116,881 lbs)



# Questions?





# Northern Shrimp Draft Amendment 4 Overview



Northern Shrimp Section

December 2024

- Background
- Overview and Timeline
- Review Draft Options
- Review Other Updates to Amendment Text

***Possible Section Action:*** Approve Draft Amendment 4 for public comment.



# Amendment 4 Background

- Initiated in 2023 in response to continued poor condition of the northern shrimp stock to consider two primary issues:
  1. Specifications Timeline
  2. Management Triggers
- Current regulations state:  
*“The Section has the ability to set a closed season annually up to 366 days (i.e., impose a moratorium)”*
- Annual specifications requirement may no longer be appropriate for the species
  - Can only be changed through an amendment to the FMP

December 2023	Section initiates Amendment 4
June 2024	Section approves PID
June 2024 – August 2024	Public comment period on PID and public hearings
September 2024	Section reviews public comment on PID and provides guidance to PDT on development of Draft Amendment 4
<b>December 2024</b>	<b>Section reviews and approves Draft Amendment 4 for public comment</b>
January 2025 – March 2025	Public comment period and public hearings
Spring 2025	Section reviews public comment and selects final measures for the amendment; Policy Board and Commission approve the amendment

1.0 Introduction

**2.0 Goals and Objectives**

**3.0 Monitoring Program Specifications/Elements**

**4.0 Management Program Implementation**

5.0 Compliance

6.0 Management and Research Needs

7.0 Protected Species

8.0 Works Cited

9.0 Tables and Figures

10.0 Appendix



# OPTIONS UNDER CONSIDERATION



## 4.1.1 Fishery Specifications and Total Allowable Catch

- Option A: Status Quo
- Option B: Extended Specifications Setting Timelines for Moratorium Years (including Sub-Options B.1-B.3)

## 4.1.3 Fishing Season

- Option A: Status Quo
- Option B: Extended Moratoriums (including Sub-Options B.1-B.3)

## 4.1.13 Management Triggers

- Option A: Status Quo
- Option B: Management Trigger(s) (including Sub-Options B.1, B.2, and New Data Provision)

## 4.5.2.2 Measures Subject to Change through Adaptive Management

- Option A: Status Quo
- Option B: Adding Specifications Timeline and Management Triggers to Adaptive Management



## **Option A: Status Quo**

- Annual specifications

## **Option B: Extended Specifications for Closed Seasons**

- Sub-Option B.1: 2 year moratoriums
- Sub-Option B.2: 3 year moratoriums
- Sub-Option B.3: 5 year moratoriums

## Option A: Status Quo

- Maximum closed season (moratorium) of up to 366 days

## Option B: Extended Moratoriums

- Sub-Option B.1: Maximum closed season of up to 2 consecutive years (731 days)
- Sub-Option B.2: Maximum closed season of up to 3 consecutive years (1,096 days)
- Sub-Option B.3: Maximum closed season of up to 5 consecutive years (1,826 days)



## **Option A: Status Quo**

- No management trigger, this section would be removed from the document

## **Option B: Management Trigger(s)**

- Sub-Option B.1: Recruitment Trigger
- Sub-Option B.2: Temperature Trigger
- Provision for the Incorporation of New Data

## Recruitment Trigger

- 3 consecutive years of non-failed recruitment would trigger stock assessment update
  - Recruitment value above the 20<sup>th</sup> percentile of the reference period for both the ME-NH Spring Survey and NEFSC Fall Survey (6/6 values above the 20<sup>th</sup> percentile)
- If a survey goes offline temporarily:
  - If offline for 1 year, 5/6 values above 20<sup>th</sup> percentile to trip trigger
  - If offline for greater than one year, 4/6 values above the 20<sup>th</sup> percentile to trip trigger

## Recruitment Trigger

- If both surveys remain online and recruitment has been above the 20<sup>th</sup> percentile for 2 consecutive years (4/4 values), Section could consider reopening winter sampling program without use of size sorting grates
  - Removing grates would allow TC to assess stage, length frequencies, and year-class persistence before commencing a full assessment update

## Temperature Trigger

- 2/3 years of winter surface temperature and spring bottom temperature below the 80<sup>th</sup> percentile of the reference period would prompt the Section to consider reopening winter sampling program without use of size sorting grates
  - Removing grates would allow TC to assess stage, length frequencies, and year-class persistence before commencing a full assessment update

# Management Triggers

- **Recruitment trigger reached** → Stock assessment update
- **Temperature trigger reached** → Section would consider running winter sampling program without size sorting grates
- **Neither trigger reached, but recruitment is above the 20<sup>th</sup> percentile of the reference period for two consecutive years and both surveys remain online** → Section would consider running winter sampling program without size sorting grates
- **Both triggers reached** → Stock assessment update and Section may choose to also run the winter sampling program with the size sorting grates removed

## New Data Provision

- New data or trigger thresholds may be incorporated into management triggers without an addendum or amendment
- Section tasks TC to evaluate new information → TC reports back to Section with recommendation → Data/thresholds could be modified via Section action



## Option A: Status Quo

1. Biological Reference Points can be changed through Section action (no addendum necessary) per Section 2.5 of this amendment
2. Rebuilding target and schedule
3. Gear requirements or prohibitions
4. Management areas
5. Harvest set-asides
6. Limited/controlled entry (including, but not limited to, days-at-sea and ITQs/IFQs and catch shares)
7. Catch controls
8. Vessel limits
9. Recommendations to the Secretary of Commerce for complementary action
10. Research or monitoring requirements
11. Frequency of stock assessments
12. Any other management measures included in Amendment 4 that are not subject to annual specification
13. Vessel monitoring programs

## Option B: Adding Specifications and Management Triggers

1. Biological Reference Points can be changed through Section action (no addendum necessary) per Section 2.5 of this amendment
2. Rebuilding target and schedule
3. Gear requirements or prohibitions
4. Management areas
5. Harvest set-asides
6. Limited/controlled entry
7. Catch controls
8. Vessel limits
9. Recommendations to the Secretary of Commerce for complementary action
10. Research or monitoring requirements
11. Frequency of stock assessments
12. Vessel monitoring programs
- 13. Specifications setting timeline**
- 14. Fishing season**
- 15. Management triggers**
- 16. Any other management measures included in Amendment 4**



# OTHER CONSIDERATIONS



## 2.3 Objectives

## 3.2 Annual Assessment

## 4.3.2 Habitat Restoration, Improvement, and Enhancement

## 4.4 Alternative State Management Regimes (Conservation Equivalency)

- Section did not task the PDT with refining the objectives of the FMP
- Given the current status of the stock and fishery, the Section may wish to refine the objectives of Draft Amendment 4

## 2.3 Objectives

- Protect and maintain the northern shrimp stock at sustainable levels that will support a viable fishery
- Optimize utilization of the resource within the constraints imposed by natural distribution of the resource, available fishing areas, changing environmental conditions, and harvesting, processing and marketing capacity
- Provide a mechanism for unique state level management of fishing effort
- Maintain the flexibility and timeliness of public involvement in the northern shrimp management program
- Maintain existing social and cultural features of the fishery to the extent possible

## 2.3 Objectives

- Minimize the adverse impacts the shrimp fishery may have on other natural resources
- Minimize the adverse impacts of regulations, including increased cost to the shrimp industry and the associated coastal communities
- Promote research and improve the collection of information to better understand northern shrimp biology, ecology, population dynamics, and responses to changing environmental conditions
- Achieve compatible and equitable management measures through coordinated monitoring and law enforcement among jurisdictions throughout the fishery management unit

## Section 3.2 Annual Assessment (Old)

The Northern Shrimp Technical Committee will perform a northern shrimp data update on an annual basis. The Technical Committee and Advisory Panel will meet to review the data update and all other relevant data sources during specifications setting years. A data update will be prepared for the Section in order to make adjustments to the management program as necessary when setting specifications. Several primary surveys are examined, including the NOAA Fisheries fall ground fish survey. Historically, the summer shrimp survey was examined, but was discontinued in after the 2023 survey. The data update report will include at least landings, effort, and survey indices of abundance, biomass, and recruitment.



## Section 3.2 Stock Assessment (Proposed Change)

Status of the stock will be reviewed annually through data updates (STLA), stock assessment updates, benchmark stock assessments, **or any new methods of stock evaluation developed by the Technical Committee.** These reports will include at least landings, effort, and survey indices of abundance, biomass, and recruitment, as well as any additional information the Technical Committee feels is relevant.

- Section 4.3.2 Habitat Restoration, Improvement, and Enhancement will be updated to reflect language in Fish Habitats of Concern Designations for Fish and Shellfish Species
  - Minimal changes needed



# 4.4 Conservation Equivalency

- Section 4.4 Alternative State Management Regimes (conservation equivalency) does not reflect the Commission's current conservation equivalency guidance (updated October 2023)
- Does the Section wish to update this section to reflect the language in the Conservation Equivalency: Policy and Technical Guidance Document?

## 4.4 Conservation Equivalency

Update language:

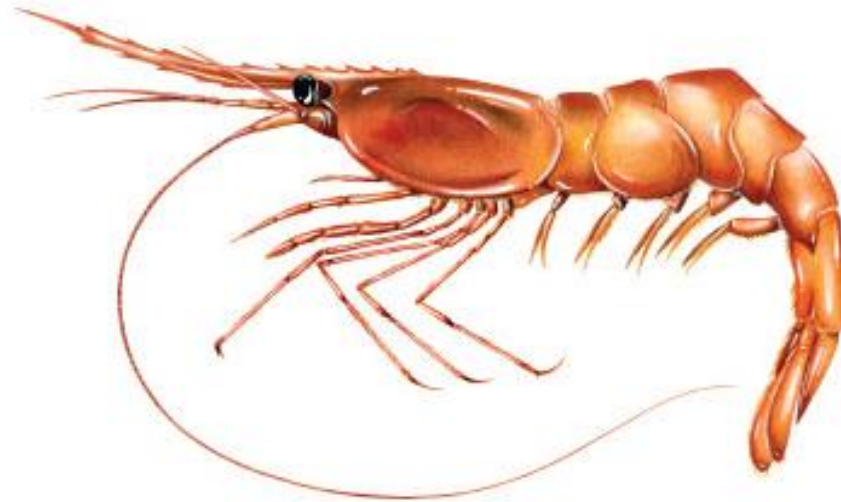
- “states are required to obtain prior approval of any changes to their management program **for which a compliance requirement is in effect**”
  - Change to → any management measures
- “All changes in state plans must be **submitted in writing to the Section and to the Commission** either as part of the annual FMP Review process or the Annual Compliance Reports.”
  - Change to → changes will be submitted to the Section Chair for formal review by PRT

## 4.4 Conservation Equivalency

Include:

- “The Section will consider if a change in the use of conservation equivalency is necessary after each stock assessment where, **conservation equivalency is not permitted if the stock is overfished or depleted, unless allowed by a 2/3 majority vote of the Section.** If the Section determines conservation equivalency is not permitted, it will apply to future actions of the Section.”

# Questions?



***Section action for consideration:*** Approve Draft Amendment 4 for public comment as presented or modified today.