



**NOAA**  
**FISHERIES**  
NEFSC

# Atlantic Herring

Jonathan J. Deroba

NEFSC

Population Dynamics Branch

Management Track Assessment

Spring 2024

ASMFC

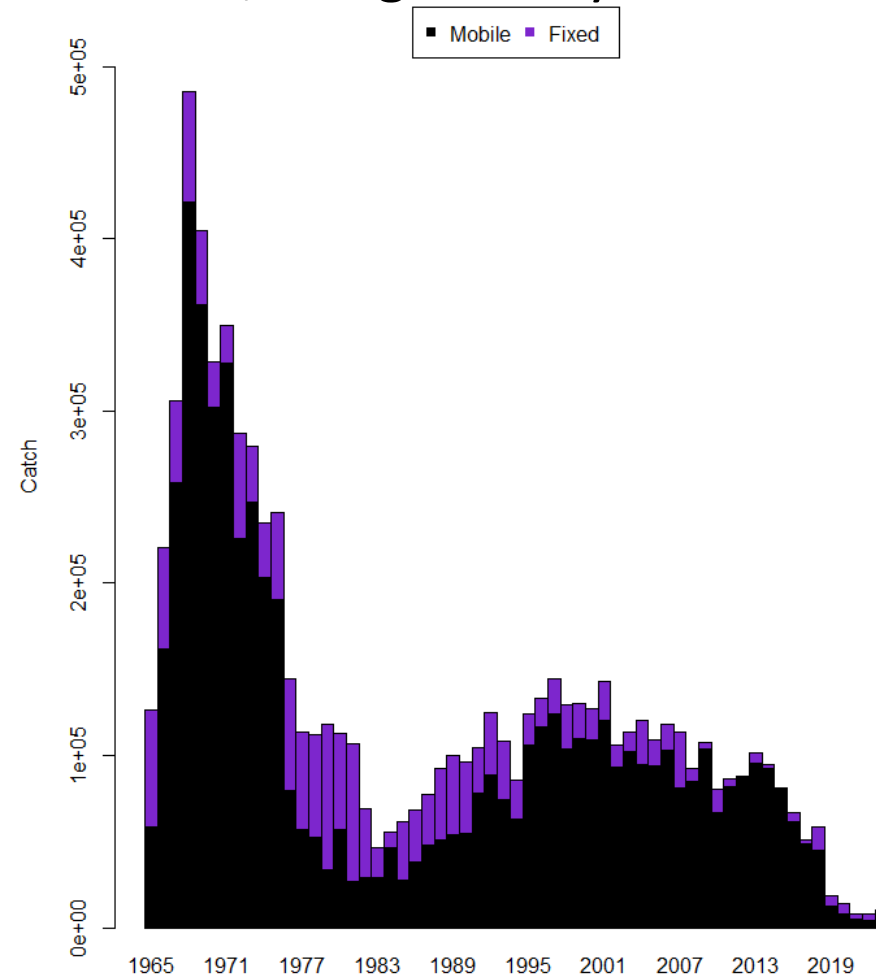
August 2024

# Background

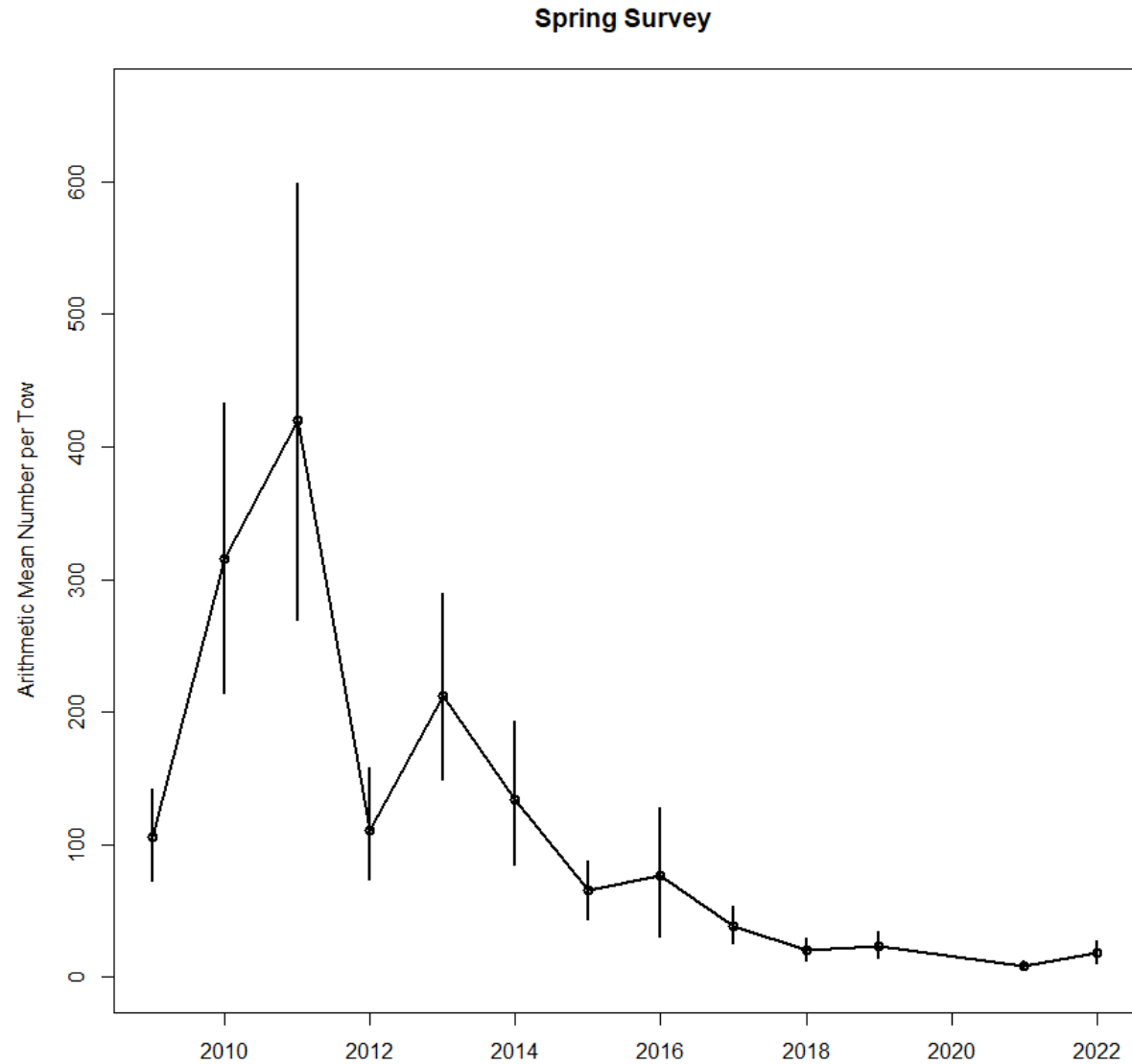
- Last assessed and reviewed June 2022
- Assessed using ASAP
  - Two fleets (fixed and mobile gears); fixed catch >90% Canadian
  - Four surveys: spring BTS, fall BTS, summer/shrimp BTS, acoustic time series collected during fall BTS
  - Constant  $M=0.35$
  - MSY reference points use  $F_{40\%}$  as proxy
- 2022 assessment concluded stock overfished but overfishing not occurring

# TOR 1: Estimate catch from all sources including landings and discards

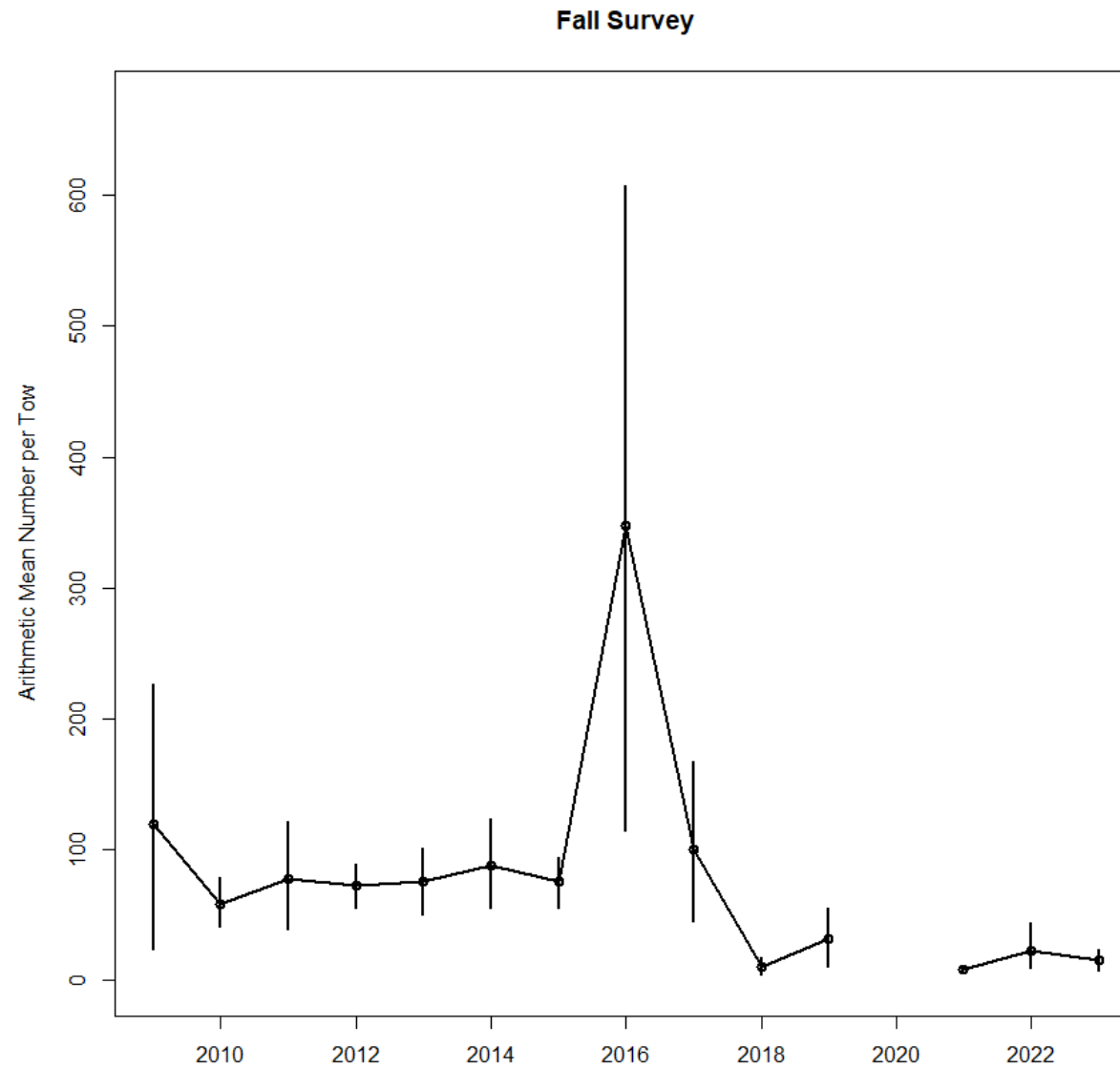
- Catch = landings + discards
  - Discards only available since 1996, but generally <1% of landings



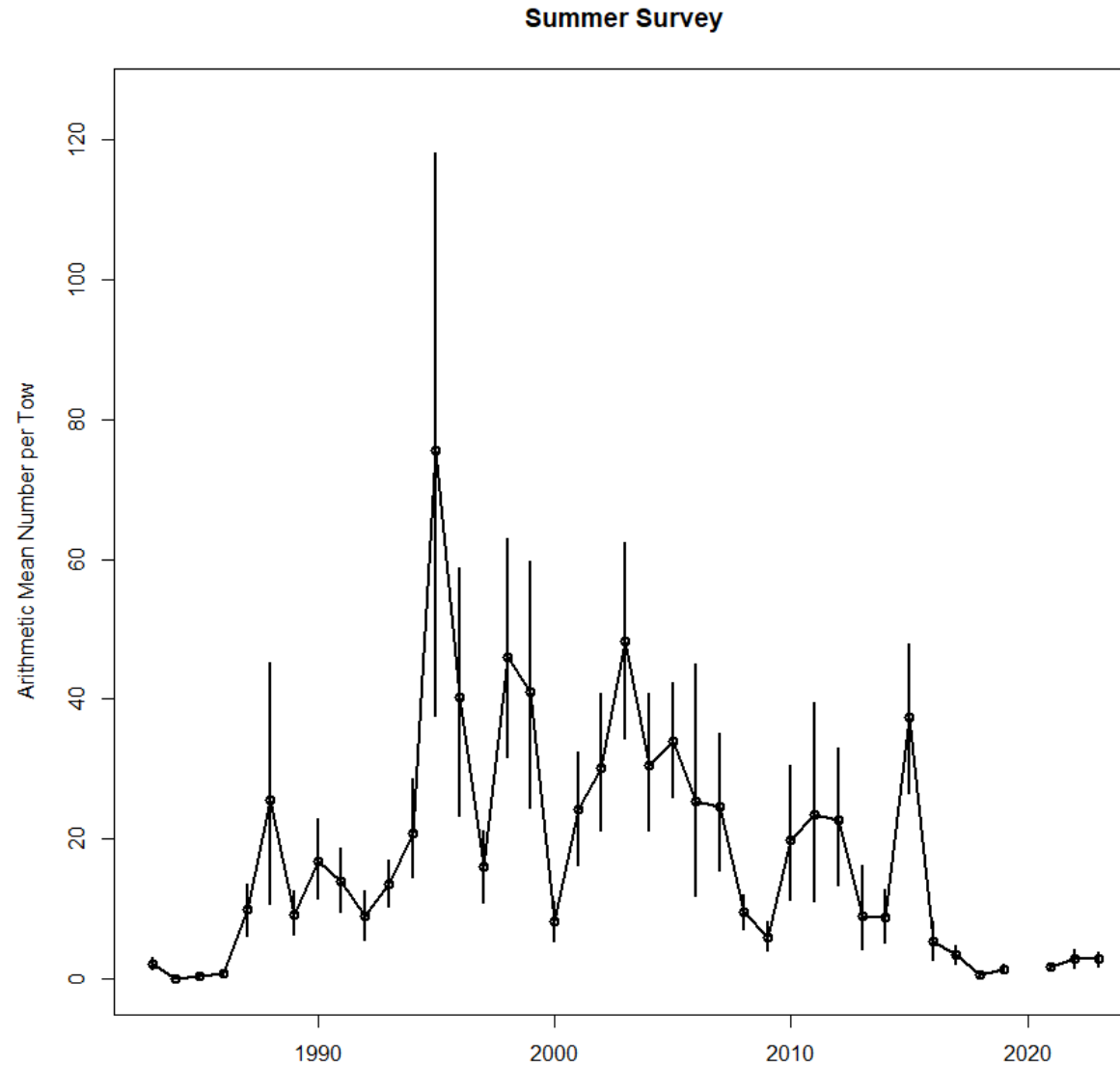
# TOR 2: Evaluate indices used in the assessment



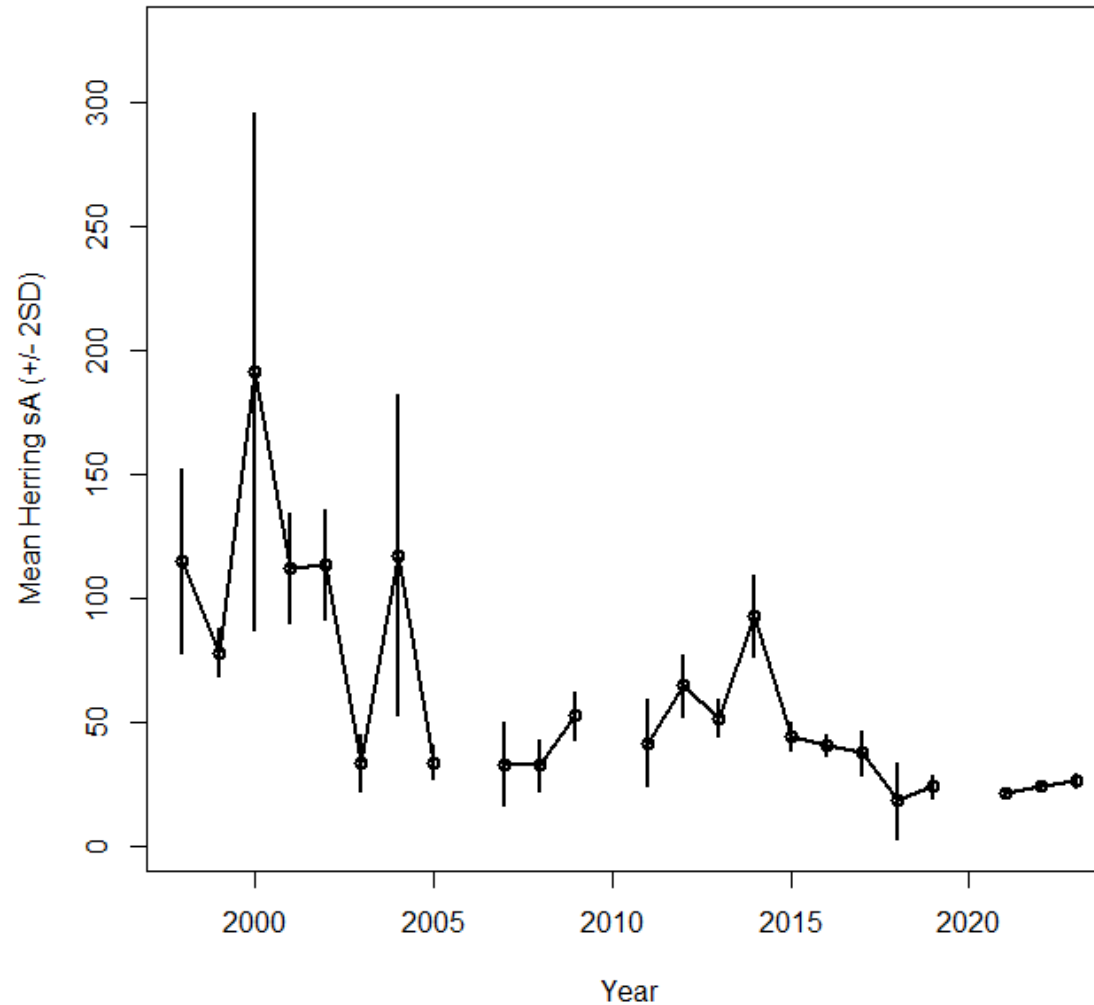
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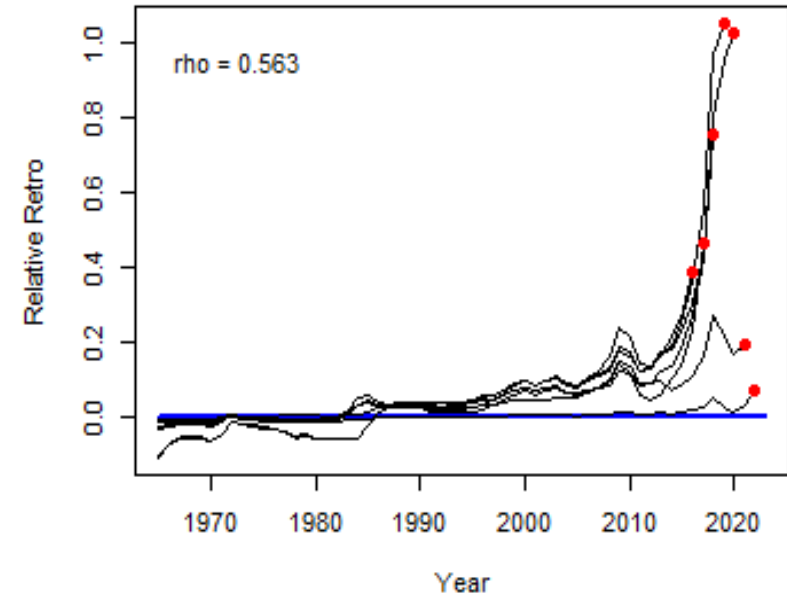
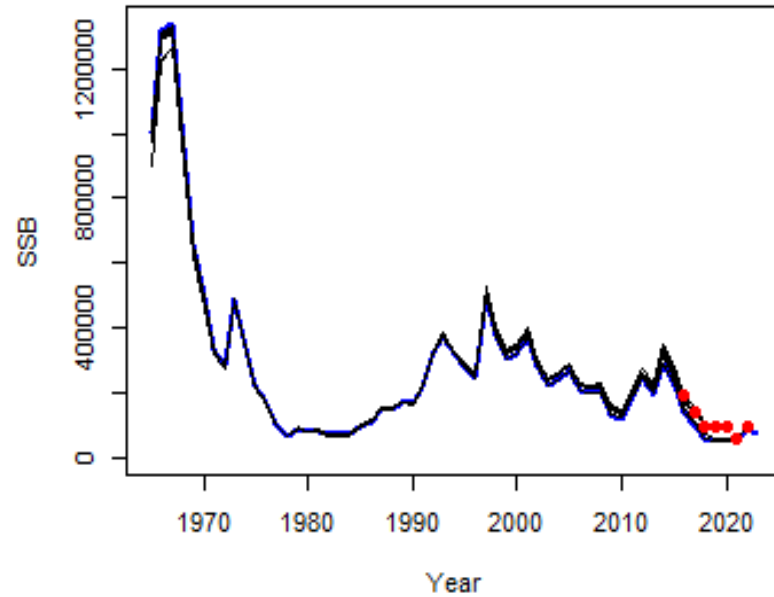
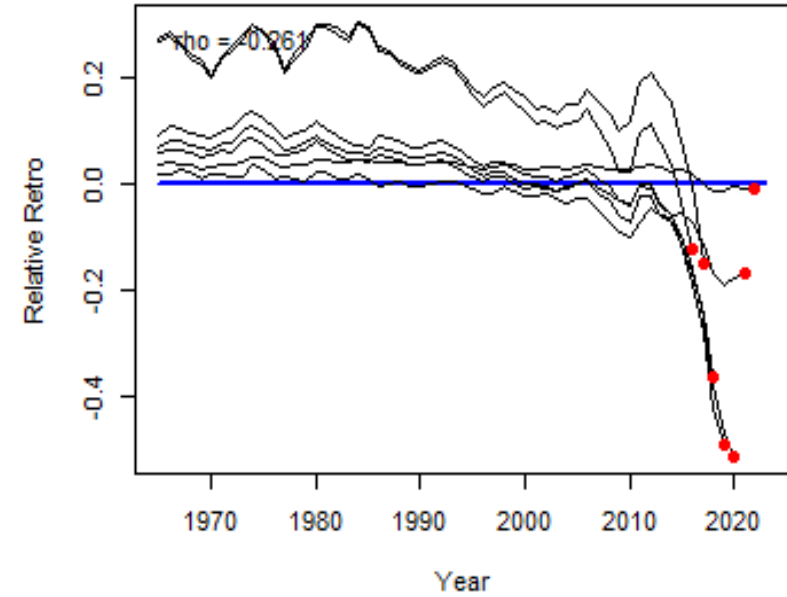
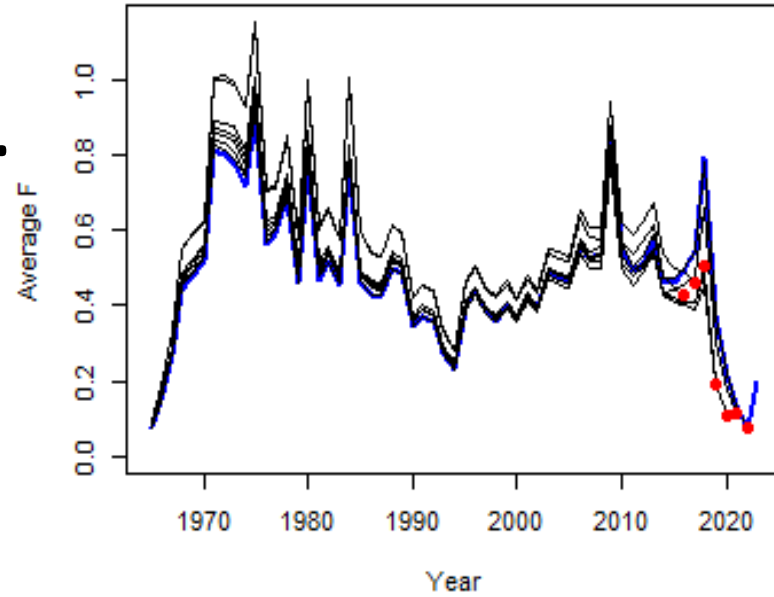


## TOR 3: Estimate...

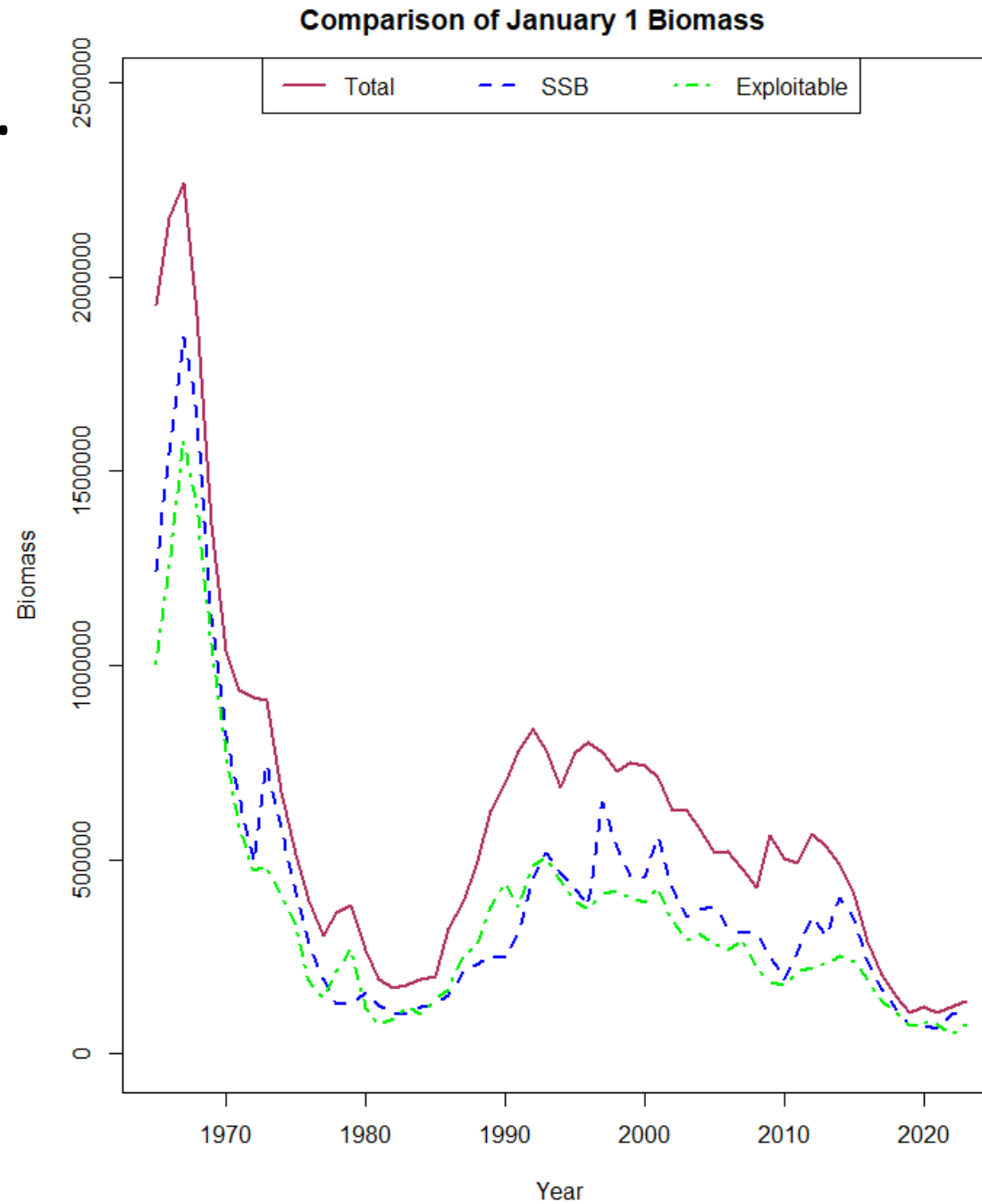
- Added 2 years of data
- No other changes to model configuration; turn the crank



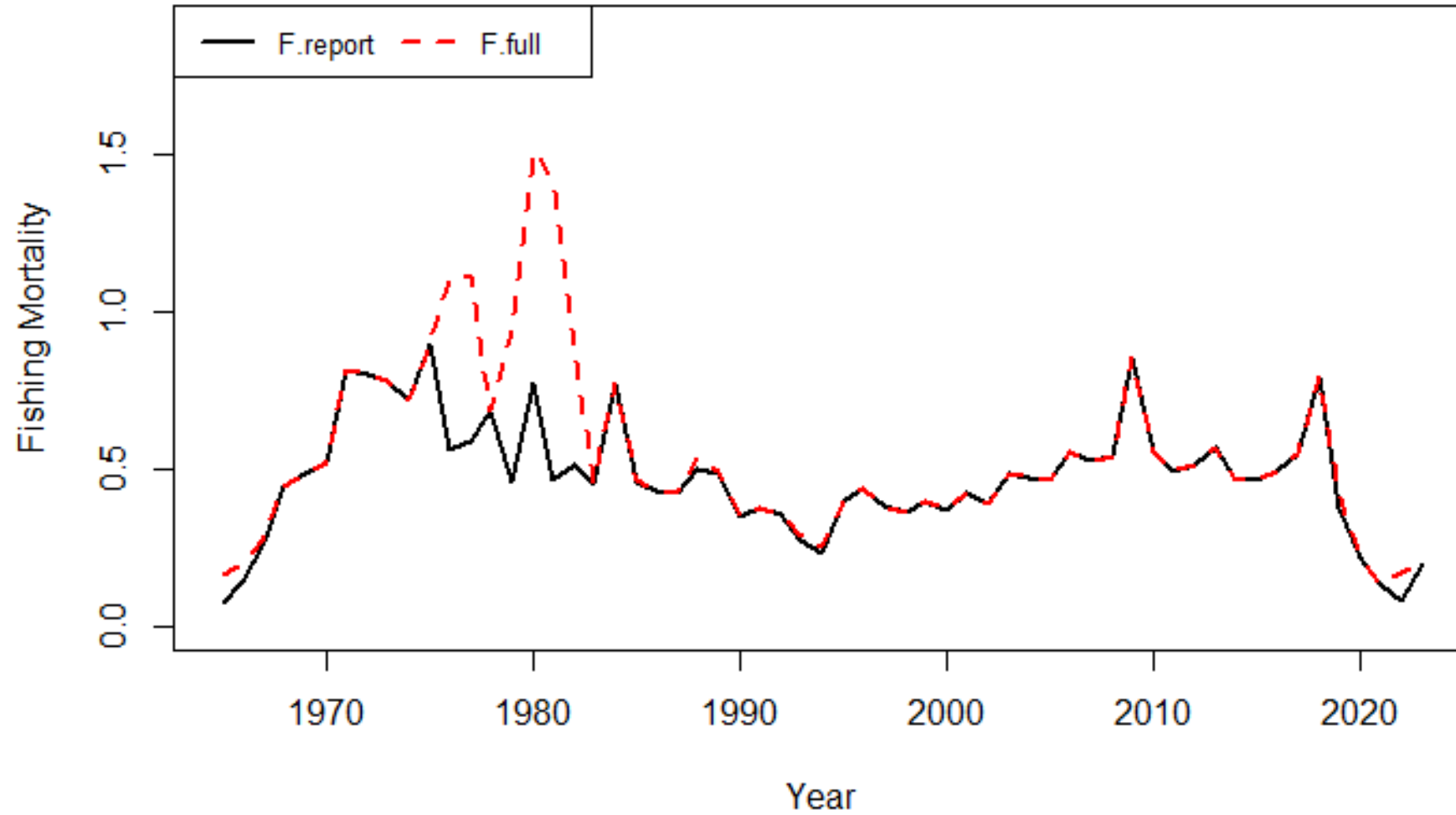
# TOR 3: Estimate...



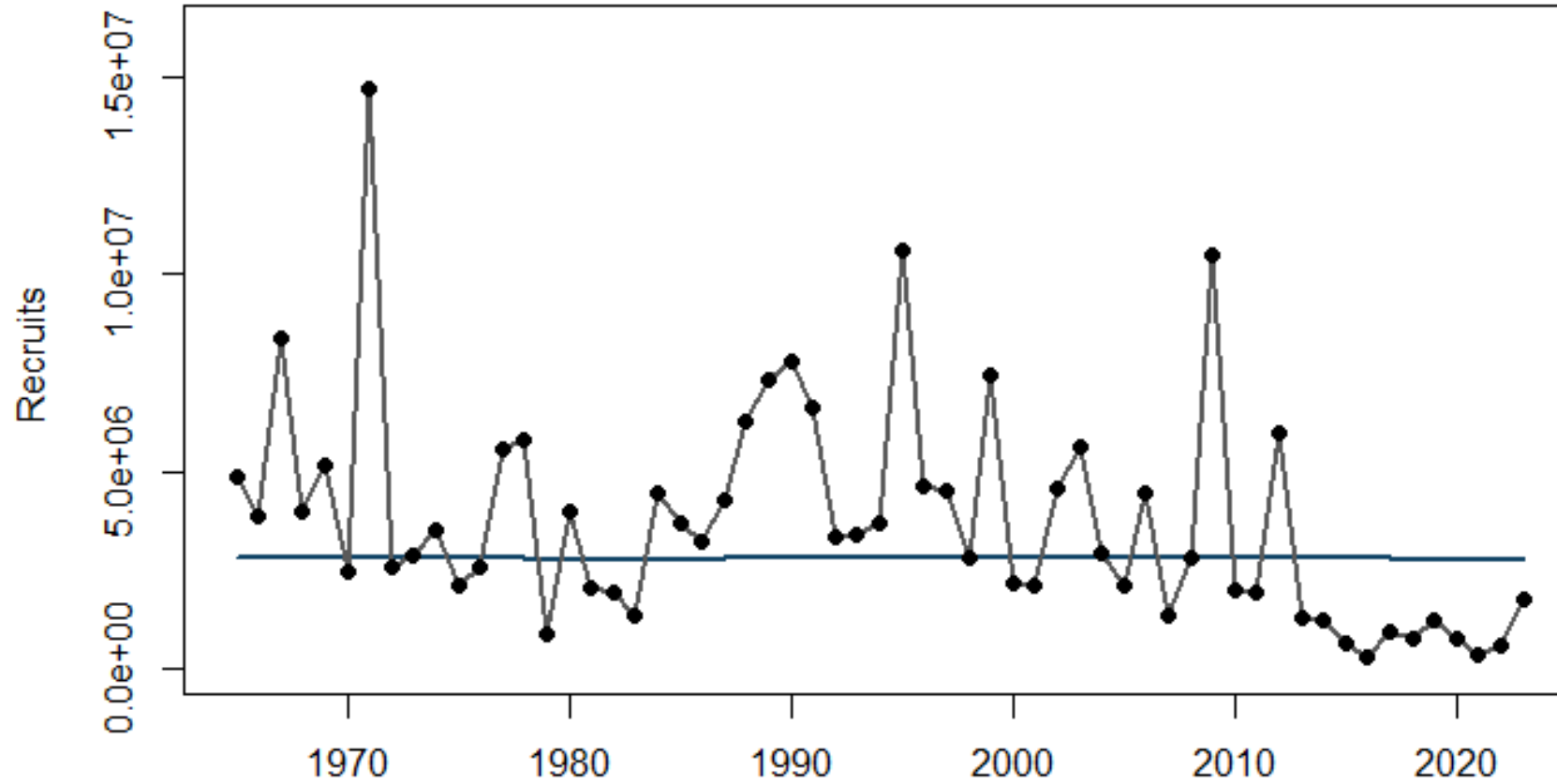
# TOR 3: Estimate...



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# TOR 4: BRPs

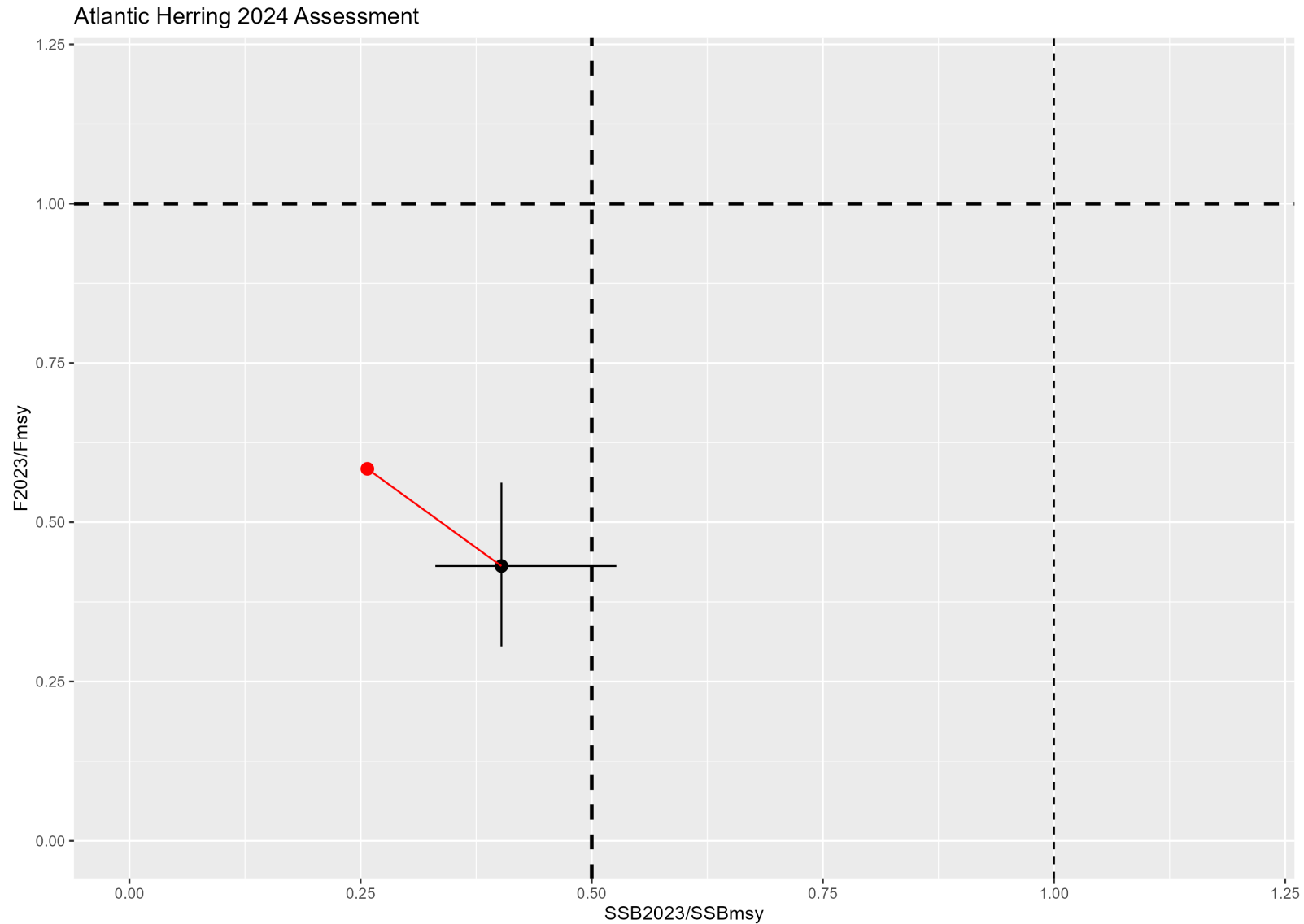
- Previous/existing methods summary
  - Life history traits (e.g., weights-at-age) based on 5 year average
  - F40% as proxy Fmsy
    - Selectivity equals that from the mobile fleet (US fleet)
  - Recruitment sampled from empirical CDF using estimates from 1992-2021
    - Most recent two years excluded due to high imprecision
  - Long term projections for SSB proxy
  - Fully selected fixed gear fleet  $F = 10$  year average (0.15; previously 0.13)

# TOR 4: BRPs

- 2022 BRPs: F40% = 0.5, SSBproxy = 185,750mt
- Updated 2024: F40% = 0.45, SSBproxy = 186,367mt

# TOR 4: BRPs

- The stock is overfished; overfishing is not occurring



# TOR 5: Short-term projections

- Previous/existing methods summary
  - Fixed gear catches equal in all years and based on 10 year average
  - Mobile fleet F based on NEFMC selected harvest control rule
  - Recruitments follow an AR(1) process
    - AR parameters estimated using arima package in R using 1992-2021 estimates
    - Initialized at rho-adjusted 2023 recruitment estimate (1,124,659)



# TOR 5: Short-term projections

*CHPTRECS\_FIXED10YRAVG\_HCR\_AR annual Canadian Catch= 4031 US Fixed= 16*

	Mobile Fleet F	SSB	P(overfishing)	P(overfished)	OFL	ABC	SSB/SSBmsy	P(rebuild)
2024	0.593	34451	0.923	1.000	-	-	0.185	0.000
2025	0.076	51904	0.000	0.886	18273	6741	0.279	0.009
2026	0.161	56718	0.005	0.857	21659	10885	0.304	0.014
2027	0.184	86607	0.035	0.565	30050	15435	0.465	0.058

# TOR 6: Research

## **SSC recommendations September 9, 2022 (all suggested for RT)**

- Investigate mechanisms behind low recruitment
- Consider informing projections with R/S for consistency with change point analysis
- Investigate whether F40% needs to be changed/reduced in lower productivity regime
- Estimate Fmsy directly
- Consider younger ages as fully-selected by mobile fleet
- Consider recruitment index based on seabird diet
- Explore approaches to estimating M, especially time varying
- Examine stock structure and movement

# TOR 6: Research

## 2022 MT peer review report

- Provide more detail on DFO methods for processing catch
  - [https://www.dfo-mpo.gc.ca/csas-sccs/Publications/ResDocs-DocRech/2020/2020\\_028-eng.html](https://www.dfo-mpo.gc.ca/csas-sccs/Publications/ResDocs-DocRech/2020/2020_028-eng.html)
  - <https://waves-vagues.dfo-mpo.gc.ca/library-bibliotheque/41190130.pdf>
  - More changes to be incorporated during RT
- Explore model based indices – Thoroughly addressed in 2012 benchmark
- Continue collecting age data during summer survey – Done
- Evaluate impact of switching from borrowed ALKs to direct age observations from summer survey – no progress
- Explore effect of likelihood penalties on recruitment estimation – no progress
- Monitor impact of missing 2020 survey data on assessments
  - Done as other species have updated assessments
  - Missing survey data being addressed in RT
- Develop a unified approach to evaluate the treatment of M in assessment – being considered in RT
- Look for causal hypotheses for temporal changes in R/S – being considered in RT
- Examine reproductive status and condition over time – being considered in RT
- Improve our understanding of fleet dynamics and relationship to herring spatial dynamics
  - No formal progress
- Analyze condition, growth, and fecundity – being considered in RT

Questions?



# 2024 FMP Review for Atlantic Herring for Fishing Year 2023



Atlantic Herring Management Board

August 6, 2024

# Overview



1. Status of the Stock (previous agenda item)
2. Status of the FMP
3. Status of the Fishery
4. PRT Comments and Recommendations

*Board action for consideration: Approve the 2024 FMP Review for fishing year 2023, state compliance reports, and de minimis requests.*

# Status of the FMP



- Amendment 3 (2016) to the Interstate FMP
  - Addendum I (2017) Days Out Program
  - Addendum II (2019) Gulf of Maine Spawning Protections
- Complementary management plans between the Commission and the New England Fishery Management Council

# Status of the Fishery



- Preliminary Landings from NOAA Fisheries Quota Monitoring

Year	Area	Sub-ACL (mt)	Catch (mt)	% Utilized
<b>2023</b>	1A	4,315 <sup>+</sup>	4,345*	101%*
	1B	555	197*	35.5%*
	2	3,589	462*	13%*
	3	4,806	5,141*	107%*
	<b>Overall</b>		<b>13,287</b>	<b>10,144*</b>

*\*PRELIMINARY*

*+Not including 30 mt fixed gear set-aside.*



# Status of the Fishery



- 2023 landings more than double from 2022, primarily due to more quota available
- ME and MA account for majority (>90% of total)

	<b>Commercial Landings (lbs.) Preliminary</b>
ME	16,114,140
NH	0
MA	5,487,938
RI	1,592,747
CT	Confidential
NY	10,757
NJ	0

# Status of the Fishery



- Some vessels regularly land Atl herring outside homeport state
- Overlap of Atl herring with other species can be challenging
  - Mackerel possession limits, especially for Atl herring Areas 2 and 3
  - Overlap with menhaden, mackerel, alewives in Maine state waters for fixed gear harvesters
- Maine fixed gear harvesters noted large adult herring more available in 2022-2023 compared to prior years

# Status of the Fishery



- Area 1A Days Out Program

Seasonal quota periods	Date Effective	Landing Days for Category A Permit	Weekly Landings Limit for Category A Permit	Landing Days for Category C/D Permits	Poundage Transferred to a Carrier Vessel
<b>1</b> <b>(72.8%)</b>	<b>July 16*-Aug 25</b>	<b>5</b>	<b>320,000</b>	<b>6</b>	<b>0</b>
	Aug 26-Sept 30	0	0	0	0
<b>2</b> <b>(27.2%)</b>	Oct 1-Oct 9	0	NA**	NA**	NA**
	<b>Oct 10-11</b>	<b>2</b>	NA**	NA**	NA**
	Oct 12-Nov 4	0	NA**	NA**	NA**
	<b>Nov 5</b>	<b>4</b>	NA**	NA**	NA**

# Status of the Fishery



- Area 1A Spawning Closures: default closure dates due to insufficient samples
  - Eastern Maine area closed Aug 28 – Oct 8
  - Western Maine area closed Sep 23 – Nov 3
  - Massachusetts/New Hampshire area closed Sep 23 – Nov 3

# PRT Comments



- PRT finds all states have regulations in place that meet the requirements of the FMP
- New York is requesting *de minimis* status and meets the requirements
  - Average of last three years of commercial landings are <1% of coastwide total for same period

# PRT Recommendations



- PRT recommends the Board discuss long-term funding solutions for ME DMR portside sampling
  - Sampling includes age, length, maturity, sex
  - Funding required for DMR staff to conduct out-of-state sampling and conduct bycatch sampling
  - Data informs spawning closures and vital for stock assessment, which uses age-structured model
  - Need alternative funding (~\$30k per year) or consider if state staff could collect samples/send to DMR

# PRT Recommendations



- PRT recommends the TC review current Add II Area 1A spawning closures protocol, and determine if any concerns with prolonged periods of insufficient samples and default closure dates
  - Insufficient samples in recent years to inform spawning closure dates due to fishery timing and reduced effort
  - Current default dates may already reflect a conservative approach, but could be beneficial for TC review



**Questions?**





# New England Fishery Management Council Atlantic Herring Update

**Atlantic States Marine Fisheries Commission**

**Atlantic Herring Management Board**

**Arlington, VA and by Webinar**

**August 6, 2024**

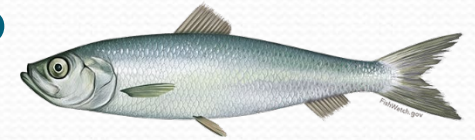
# Atlantic Herring Outlook by Quarter in 2024

Council Priority	Jan – Mar	Apr - Jun	July - Sept	Oct - Dec
Amendment 10	Plan for Scoping	Public Scoping	Prepare summary Council: summary of comments	Develop Alternatives*
Specifications 2025-2027	AOP Meets		MT Stock Assessment Council: update	Develops alternatives and impacts analysis Council: final action Submit action to GARFO
Research Track Stock Assessment	NEFSC-led Working Group; Work Underway**			

\*ASMFC’s River Herring Stock Assessment – available in August 2024

\*\* Atlantic Herring Research Track - report to be drafted by end of 2024; peer review in March 2025

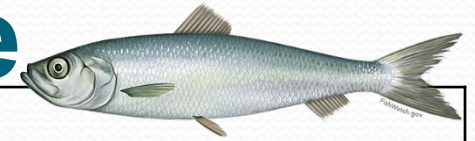
# 2025-2027 Specifications



To include:

1. Overfishing limit (OFL), acceptable biological catch (ABC) using ABC control rule and rebuilding plan
2. Management uncertainty, annual catch limit (ACL), management area sub-ACLs, river herring and shad catch caps (status quo), and other components

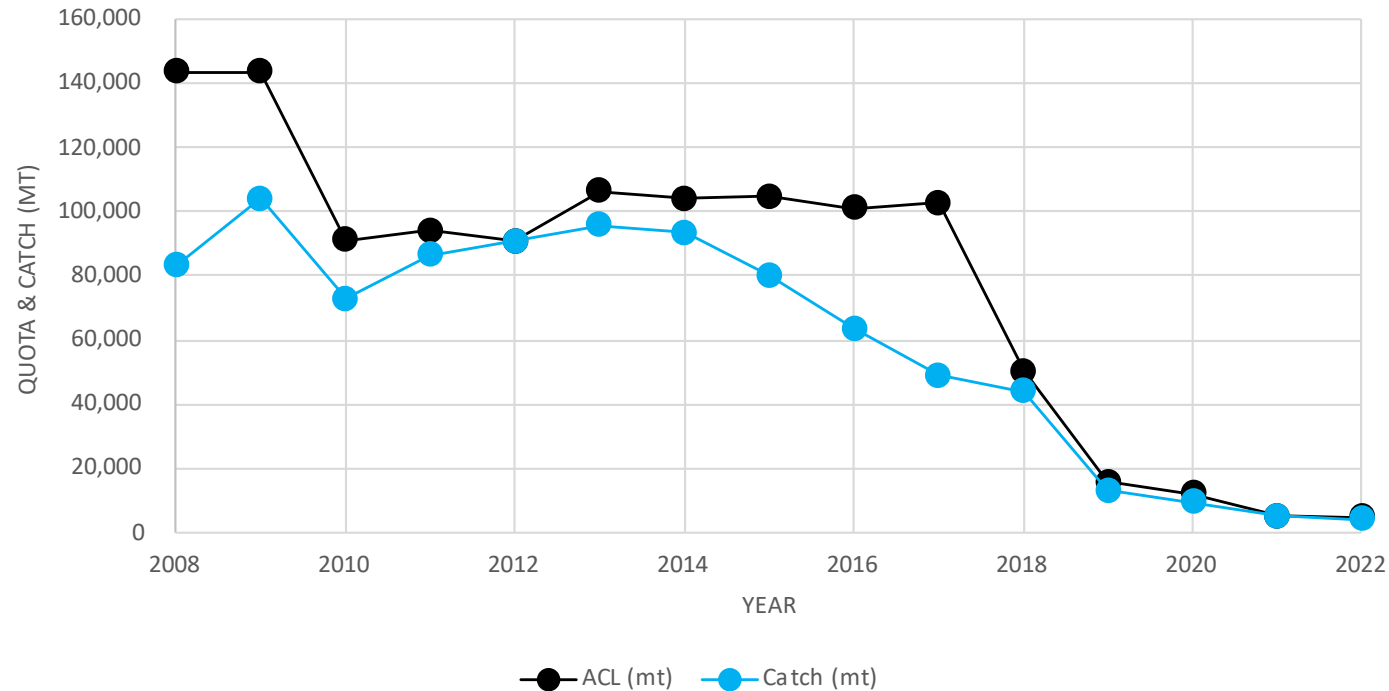
# NEFMC / ASMFC Timeline



2024		
February 28	Assessment Oversight Panel recommended Level 1 Management Track Stock Assessment	Webinar
May 10	Plan Development Team (PDT) discusses timeline	Webinar
June 13-14	Advisory Panel and Committee receive update	In-Person & Webinar
June 24-27	Council receives update	In-Person & Webinar
July 9	PDT meets with ASMFC's Technical Committee (TC) to develop OFL and ABC recommendations	Webinar
July 30-31	Scientific and Statistical Committee recommends OFLs and ABCs	In-Person & Webinar
August 2	PDT meets with TC to develop specifications	Webinar
August 6-8	<i>ASMFC Atlantic Herring Management Board receives stock assessment presentation</i>	In-Person & Webinar
August - September	PDT prepares the action and meets with TC to discuss specifications	In-Person & Webinar
August 22	Joint Committee and AP meeting	Webinar
September 12	Advisory Panel and Committee meet and review analysis and make recommendations	In-Person & Webinar
September 24-26	Council final action	In-Person & Webinar
October 21-24	<i>ASMFC Atlantic Herring Management Board sets specifications</i>	In-Person & Webinar
TBD	Submit action to GARFO	
2025		
January 1, 2025	Target implementation	

# Fishery Performance and Specifications

US Atlantic Herring Fishery Performance



Year	ACL (mt)	Catch (mt)	Utilization
2008	143,350	83,239	58.1%
2009	143,350	103,942	72.5%
2010	91,200	72,851	79.9%
2011	93,905	86,245	91.8%
2012	90,683	90,561	99.9%
2013	106,375	95,764	90.0%
2014	104,088	93,247	89.6%
2015	104,566	80,011	76.5%
2016	101,135	63,581	62.9%
2017	102,656	49,072	47.8%
2018	50,195	43,878	87.4%
2019	15,613	13,079	83.8%
2020	12,225	9,591	78.5%
2021	5,128	5,268	102.7%
2022	4,813	4,234	88.0%

Current Specifications (mt)

Year	OFL	ABC	ACL
2023	29,138	16,649	12,429
2024	32,233	23,409	19,141
2025	40,727	28,181	23,961

# PDT/TC Recommendations

## Rationale:

- consistent with the Council's ABC control rule,
- based on the rebuilding plan with updates to recruitment assumptions in the 2024 assessment,
- incorporates an estimate of catch from the New Brunswick fixed gear fishery, and
- uses the most updated data available.

Year	OFL (mt)	ABC (mt)
2025	18,273	6,741
2026	21,659	10,885
2027	30,050	15,435

# SSC Recommendations – July 31, 2024

## DRAFT Council Staff Summary of SSC's Rationale / Discussion

- Stays with the Council's ABC control rule,
- Recognizes continued poor recruitment and low spawning stock biomass,
- Rebuilding progress is falling behind,
- 2025-2027 ABCs represent major reductions from current levels,
- Important to use the control rule given that it incorporates stakeholder input and the role of herring in the ecosystem, and
- Concerns regarding overly optimistic projections

Year	OFL (mt)	ABC (mt)
2025	18,273	6,741
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Scientific and Statistical Committee Recommendations July 31, 2024

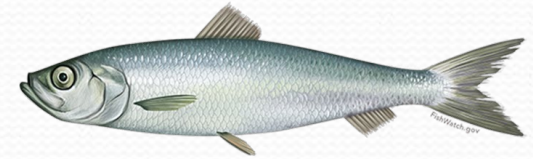
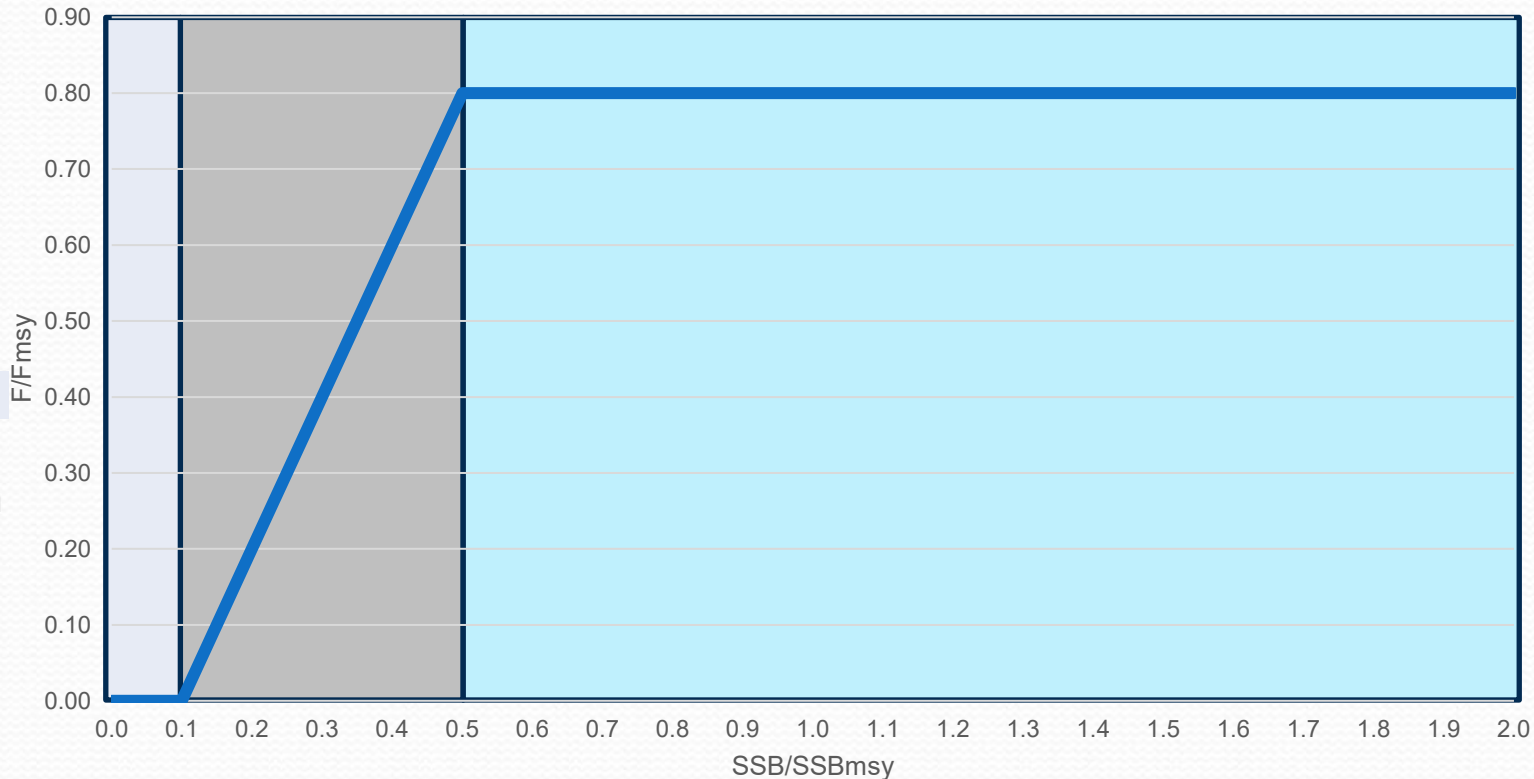
# Council's ABC Control Rule

## Biomass-based

When biomass is greater than 0.5 for the ratio of  $SSB/SSB_{MSY}$ , the maximum fishing mortality allowed is 80% of  $F_{MSY}$ .

As biomass declines, fishing mortality declines linearly, and if biomass falls below 0.1 for the ratio of  $SSB/SSB_{MSY}$ , then ABC is set to zero, no fishery allocation.

The Council's ABC control rule explicitly accounts for the role of Atlantic herring as forage in the ecosystem by limiting fishing mortality at 80% of  $F_{MSY}$ .

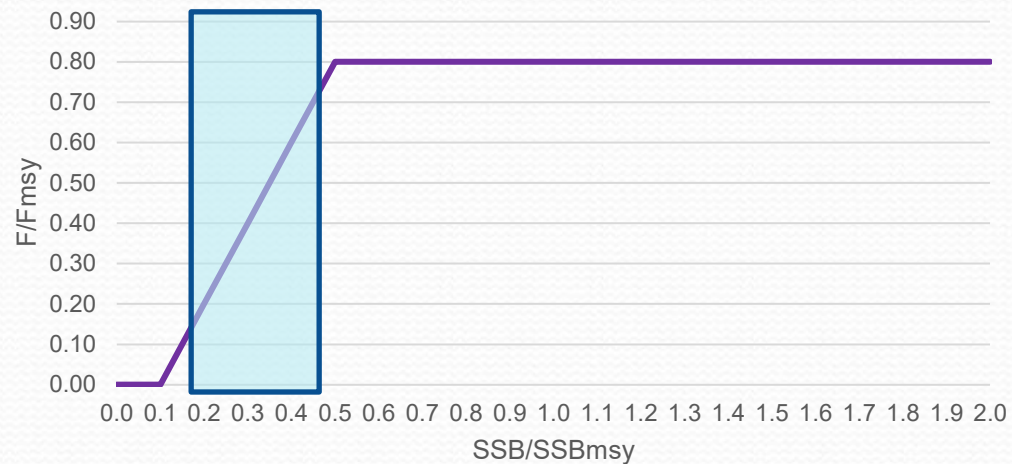




# Short-Term Projections

CHPTRECS\_FIXED10YRAVG\_HCR\_AR annual Canadian Catch= 4031 US Fixed= 16

	Mobile Fleet F	SSB	P(overfishing)	P(overfished)	OFL	ABC	SSB/SSBmsy	P(rebuild)
2024	0.593	34451	0.923	1.000	-	-	0.185	0.000
2025	0.076	51904	0.000	0.886	18273	6741	0.279	0.009
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# Rebuilding Plan – Updated Projections

				Probability of rebuilding estimated to be 50% or more					
Year 1				FW9		2022 MT			2024 MT
2022	2023	2024	2025	2026	2027	2028	2029	2030	2031



Changes applied to the BRPs and projections & used autoregressive model for recruitment (rather than recruits drawn from a CDF of the entire time series)



Same methods as 2022 MT with additional years added

# Standard Projections

	Mobile Fleet F	Mobile Fleet F 95%CI	SSB	SSB 95%CI	P(overfishing)	P(overfished)	OFL	ABC	SSB/SS Bmsy	SSB/SSBmsy 95%CI	P(rebuild)	P(closure)			
2024	0.593	0.409	0.859	34450	21803	52779	0.923	1.000	-	-	0.185	0.117	0.283	0.000	0.009
2025	0.076	0.033	0.151	51905	24655	141054	0.000	0.886	18272	6741	0.279	0.132	0.757	0.009	0.004
2026	0.161	0.067	0.344	56730	27483	153330	0.005	0.857	21653	10882	0.304	0.147	0.823	0.014	0
2027	0.184	0.066	0.489	86578	40574	228835	0.035	0.567	30078	15450	0.465	0.218	1.228	0.057	0
2028	0.328	0.093	1.318	119449	45609	405658	0.300	0.321	40029	31117	0.641	0.245	2.177	0.221	0
2029	0.360	0.080	2.884	144384	47435	569121	0.375	0.236	48649	40581	0.775	0.255	3.054	0.348	0
2030	0.360	0.067	5.000	168847	49956	692995	0.389	0.182	56715	47209	0.906	0.268	3.718	0.443	0
2031	0.360	0.060	5.000	188966	52847	777716	0.395	0.147	63880	53116	1.014	0.284	4.173	0.508	0
2032	0.360	0.056	5.000	204360	55831	836424	0.396	0.123	69715	57953	1.097	0.300	4.488	0.554	0
2033	0.360	0.054	5.000	215281	58263	877951	0.399	0.108	74081	61555	1.155	0.313	4.711	0.583	0
2034	0.360	0.052	5.000	222616	60367	900895	0.398	0.097	77072	64038	1.195	0.324	4.834	0.601	0
2035	0.360	0.051	5.000	227582	61866	923870	0.397	0.091	79082	65692	1.221	0.332	4.957	0.616	0

# DRAFT 2025 Specifications

OFL = 18,273 mt

## Scientific Uncertainty

- ABC control rule and rebuilding plan

ABC = 6,741 mt

## Management Uncertainty = 4,031 mt

- Canadian NB weir fishery

ACL = 2,710 mt

Area 1A  
(28.9%)  
783 mt

Area 1B  
(4.3%)  
117 mt

Area 2  
(27.8%)  
753 mt

Area 3  
(39%)  
1,057 mt

	Current Specifications (mt)		
Year	OFL	ABC	ACL
2024	32,233	23,409	19,141
2025	40,727	28,181	23,961

# DRAFT 2025 ACL Reduction

## If a total US ACL of 2,710 mt in 2025

- Represents about 14% of the ACL for 2024
  - 19,141 mt for 2024
- Is about 66% of the current in-season catch for 2024
  - 4,084 mt (as of July 18, 2024)
- Would be the lowest ACL in the history of the FMP
  - 2022 is the current lowest ACL and catch
- Lead to negative social and economic commercial fishery impacts
  - Low catch limits in the four management areas

## Atlantic Herring Outlook by Quarter in 2024

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Specifications 2025-2027	AOP Meets		MT Stock Assessment Council: update	Develops alternatives and impacts analysis Council: final action Submit action to GARFO
Research Track Stock Assessment	NEFSC-led Working Group; Work Underway**			

\*ASMFC’s River Herring Stock Assessment – available in August 2024

\*\* Atlantic Herring Research Track - report to be drafted by end of 2024; peer review in March 2025

# Amendment 10 Problem Statement

“The purpose of this action is to develop and implement management actions designed to attain optimum yield and improve the conservation status of Atlantic herring by accounting for its critically important role as a forage species in the ecosystem and minimizing user conflicts created by competing interests on the herring resource between the directed herring fishery and other important user groups, including commercial and recreational fisheries, whale watching, and tourism.”

## Amendment 10 Problem Statement (continued)

“This Council will explore a range of management alternatives to minimize user conflicts, including spatially and temporally explicit gear restrictions, area closures, and possession limits. The geographic scope of potential management measures will consider, but not be limited to, the spatial extent of the Midwater Trawl Restricted Area approved by the Council in Amendment 8, with a particular focus on areas not already subject to seasonal closures to midwater trawling.”



## Amendment 10 Problem Statement (continued)

“The current management measures to address catch of shad and river herring in the directed Atlantic herring fishery have catch estimation challenges and were instituted when the abundance and landings of Atlantic herring were much higher than they presently are. This action will augment efforts to restore and maintain runs of river herring and shad through consideration of management alternatives for the directed Atlantic herring fishery that enhance river herring and shad avoidance and catch reduction (e.g., time/area closures and/or reconsideration of catch caps).”

# Amendment 10 Development to Date

**December 2022**

Council passes a motion to “revisit Amendment 8 inshore midwater trawl closure”; Council prioritizes an analysis to investigate what combination of factors may have led to low shad & river herring bycatch estimates in 2020-2022

**April 2023**

Herring Committee & Advisory Panel discuss priority, develop tasking motions for Herring PDT; Herring PDT develops memo re: river herring and shad priority; Council passes a draft problem statement, remanded it to the Committee for refinement

**June 2023**

Council adopts the draft problem statement

**September 2023**

Council passes a motion tasking the Herring Committee and PDT with developing a scoping document for public scoping process; Council initiates Amendment 10

**December 2023  
January 2024**

Council adds consideration of river herring and shad management measures to A10; Revises problem statement for river herring and shad; Council approves the scoping document

**March – June  
2024**

Scoping process commences; public Scoping period for A10 (March 1-April 30); Herring PDT develops summary of public comments; Committee / Council review of scoping and PDT tasking

# Public Comment Period

## January

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	<b>30</b>	<b>31</b>			

## February

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				<b>1</b>	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29		

## March

Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

## April

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	<b>16</b>	<b>17</b>	<b>18</b>	19	20
21	22	23	24	25	26	27
28	29	30				

## May

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

## June

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b>	28	29
30						

Bold boxes indicate Council meetings  
Blue shaded boxes indicate public comment period of 60 days

# Public Scoping Meeting Schedule

<b>Friday, March 1</b> <b>1-2:30 pm</b>	<b>Rockport, ME</b> <i>Maine Fishermen's Forum, Samoset Hotel</i>
<b>Monday, March 4</b> <b>6-8 pm</b>	<b>Portsmouth, NH</b> <i>Urban Forestry Center</i>
<b>Tuesday, March 19</b> <b>6-8 pm</b>	<b>South Kingstown, RI</b> <i>Hampton Inn, 20 Hotel Drive</i>
<b>Wednesday, March 27</b> <b>6-8 pm</b>	<b>Buzzards Bay, MA</b> <i>Hampton Inn, 12 Kendall Rae Place</i>
<b>Wednesday, April 17</b> <b>6-8 pm</b>	<b>Mystic, CT and Webinar</b> <i>NEFMC Meeting, Hilton Hotel</i>
<b>Monday, April 22</b> <b>6-8 pm</b>	<b>Webinar</b>

# Scoping Meeting Comment Summary

Date	Location	Number of Attendees <sup>1</sup>	Number of Speakers
March 1	Rockport, ME	70	4
March 4	Portsmouth, NH	27	1
March 19	South Kingstown, RI	17	11
March 27	Buzzards Bay, MA	44	29
April 17	Mystic, CT & via Webinar	106	34
April 22	Webinar	28	4
<b>TOTAL</b>		<b>292</b>	<b>78<sup>2</sup></b>

<sup>1</sup>Approximate values; excludes Council/Herring Committee members and Council staff. See meeting summaries for full attendance details.

<sup>2</sup>Duplicates removed.

# Written Public Comments

Written Comment Type	Number of Comments
Letters from Individuals/Businesses <sup>1</sup>	106 <sup>2</sup>
Letters from Organizations	50 <sup>3</sup>
Form Letters (all)	655 <sup>4</sup>
<b>TOTAL</b>	<b>811</b>

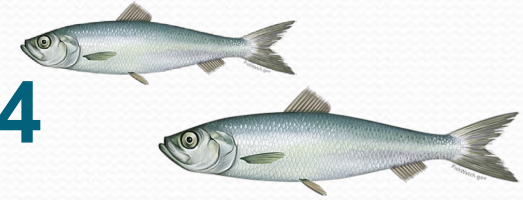
<sup>1</sup>Includes letters received from groups of 2.

<sup>2</sup>108 individuals submitted 106 comments (one commenter submitted 3 comments; 4 groups of 2 submitted comments).

<sup>3</sup>54 organizations submitted 50 comments (3 organizations submitted 2 comments each; one letter was signed by several organizations).

<sup>4</sup>645 individuals submitted 655 comments.

# Atlantic Herring Committee - June 14

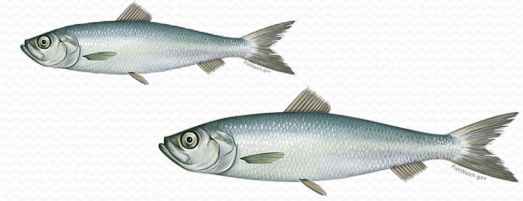


Task the Atlantic Herring Plan Development Team to analyze user group overlap on the Atlantic herring resource. This analysis could investigate space and time interactions if data is available.

*Rationale:* To isolate where conflict issues may occur and support a more focused discussion. As a starting point for this analysis, the PDT should look at the Amendment 10 Scoping Document - section on Amendment 8 user groups and user groups identified during scoping.

*The motion passed by consensus and without objection.*

# Council Motions – June 24



That the Atlantic Herring Plan Development Team assess data availability and analyze and develop alternatives for Amendment 10 that implement time/area closures for portions of Atlantic Herring Management Areas 2 and 3 where aggregations of river herring and shad overlap with the directed Atlantic herring fishery.

That the Atlantic Herring Plan Development Team assess data availability and analyze and develop alternatives for Amendment 10 that implement revisions to the basis of river herring and shad catch cap values that: (1) are reflective of regional river herring/shad abundance, and (2) scale (with ceilings and floors) to changes in Atlantic herring abundance and/or regional river herring abundance.

That the Atlantic Herring Plan Development Team analyze and develop recommendations for implementing improvements to the accuracy and precision of river herring and shad catch estimates in the directed Atlantic herring fishery.