Atlantic Herring

Herring Committee Meeting
New England Fishery Management Council
June 22, 2023
Wakefield, MA and by Webinar
2023 Council Priorities

- Coordination with MAFMC, ASMFC on various herring issues (RH/S, etc.), including actions in response to 2023 assessment; include an analysis of the combination of factors (e.g. sampling intensity, estimation methodology, inherent assumptions) that may have led to low 2020-2022 shad/river herring bycatch estimates in the Atlantic herring fishery

- Revisit Amendment 8 inshore midwater trawl closure

- Staff: Research track assessment (working group participation) - Atlantic herring
## Council Priority

<table>
<thead>
<tr>
<th>Specifications 2023-2025</th>
<th>Jan – Mar</th>
<th>Apr - Jun</th>
<th>July - Sept</th>
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<tr>
<td>Final Submission</td>
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<td>GARFO Implementation</td>
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| River Herring / Shad | | | | PDT analysis of 2020-2022 catch estimates |

| Revisit A8 Inshore MWT Closure | | | | Overview of Issues and Court decision, Discuss Next Steps |
| | | | | Develop Problem Statement |
| | | | | TBD |

| 2024 Council Priorities | Preliminary discussion/list | | | Set 2024 Priorities |

| Research Stock Assessment | | NEFSC-led Working Group; Work Begins | | |

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**Herring Outlook by Quarter in 2023**, updated Jun 9, 2023, NEFMC Staff
Purpose
Receive a report from the Plan Development Team, suggest revisions to a draft problem statement, and discuss preliminary PDT work on Committee tasking.

Revisit Amendment 8
Inshore Midwater Trawl Closure
A8 Inshore Midwater Trawl Closure

- 12-mile buffer zone from RI to US/Canada border; 20-mile buffer east of Cape Cod
- Prohibits vessels from "using, deploying, or fishing with midwater trawl gear" within restricted area
  - Short-duration, high volume herring removals
  - MWT are more mobile/capable of fishing further offshore than other gear types
- Addressed concerns that concentrated, intense commercial fishing efforts would negatively impact other user groups (commercial, recreational, tourism) dependent on herring as forage
- In addition to seasonal MWT closure in Area 1A (June 1-September 30, annually)
Rationale

“An Amendment 8 goal is to address localized depletion in inshore waters. This measure is expected to address that goal and is most consistent with the problem statement developed in this action to help frame the development of alternatives that would address, “…concerns with concentrated, intense commercial fishing of Atlantic herring in specific areas and at certain times that that may cause detrimental socioeconomic impacts on other user groups (commercial, recreational, ecotourism) who depend upon adequate local availability of Atlantic herring to support business and recreational interests both at sea and on shore.” The user conflicts, competing interests in using herring for the directed fishery versus maintaining herring in the ecosystem for predators, are a part of the Amendment 8 socioeconomic objectives.”

Amendment 8 FEIS (2019)
“This measure also meets the first goal of Amendment 8, to account for the role of Atlantic herring within the ecosystem, including its role as forage. It was discussed that while the proposed ABC control rule sets aside a portion of available catch for forage, this measure expands that concept by more directly addressing the spatial and temporal considerations of herring as forage. While the FMP later sub-divides the overall catch into four management units to help prevent overfishing one sub-component of the overall herring stock, it was discussed that this measure helps protect herring nearshore by reducing fishing pressure within 12-nautical miles where many predators eat herring. This measure in combination with the proposed ABC control rule better account for the role of Atlantic herring within the ecosystem, including its role as forage.”

Amendment 8 FEIS (2019)
Motion (Draft Problem Statement): The Council intends to explore possible detrimental biological and socioeconomic impacts of user group conflicts related to availability of Atlantic herring through examination of the ecosystem role of Atlantic herring in the area included in Amendment 8 exclusion zone, Atlantic herring as prey for other species in this area, the incidental catch of river herring and shad and other species in this area, updated data on activity by all users in this area, and spatial and temporal variations on the Amendment 8 buffer zone that could address the concerns of the herring fishery and other stakeholders.

Motion: That the Council commits the draft problem statement motion to the Herring Committee for further development and refinement with the intention that the Council at its June business meeting takes up the work of the Committee on the problem statement.
Committee can establish clear goals in terms of user group conflicts

Language in problem statement:
- Defining "user conflicts"
- Clarifying "users" (i.e. will wind development be considered?)
- Took out "localized depletion“, expanded focus from just midwater trawl gear—could lend more flexibility

Intent is to re-examine the A8 midwater trawl exclusion zone, but may find that other measures are more appropriate for achieving goals (i.e. a refined subset of areas)

Support for including spatial and temporal variations of A8 buffer zone to address concerns
- New language expands possibilities beyond re-establishing the same MWT buffer zone

Opted to send statement back to Committee for refinement, bring back to Council in June with possible change in priorities
One definition of a problem statement is: “a description of an issue to be addressed or a condition to be improved upon. It identifies the gap between the current problem and goal. The problem statement should be designed to address the Five W’s” (i.e., who, what, where, when, why).

As the Committee is developing ideas for a problem statement, also consider that, in general, a goal is a desired result or outcome that would solve a problem. A goal is typically broad and long-term in scope. A goal could be the vision for what resolution of the identified problem looks like and what would signal it has been resolved.

Furthermore, the PDT would like clarification as to what the problem is. The draft statement mentions “user group conflicts,” but the statement does not identify specific stakeholders or conflicts.
PDT Discussion Points & Questions

- Does the Committee wish to specifically identify the user group conflicts? It may be better to state this as competing interests that could be a source of user group conflicts. The ecosystem impact of having less herring available is a source of conflict.

- What would the measurable benefits be for this action? Are there specific metrics for evaluation?

- Does “the herring fishery” only refer to the midwater trawl fishery, or are purse seining and bottom trawl fisheries included?
Will this action apply to all Atlantic herring gear types: midwater trawl, purse seine, bottom-trawl, and fixed? Depending on the action and if only for midwater trawl, this could be difficult given the Court’s ruling. Do you mean the “current directed fishery” or “the past directed fishery”? For example, the activity by midwater trawls is different now than it was in the recent past.

Should the geographic extent of the management boundary be that of the year-round Herring Inshore Midwater Trawl Restricted Area? Or should it be expanded, for example, to include Stellwagen Bank National Marine Sanctuary? Should the analysis be conducted across a broader geographic area?
PDT Discussion Points & Questions

- Should river herring and shad be considered in this action or in a separate action? (See River Herring and Shad section of this memo). Council Staff notes that either approach will prompt a change in Council priorities discussion. Generally, how incidental catch of non-target species is related to the availability of herring is not reflected in the draft problem statement.

- The PDT notes the data supporting the analysis conducted for A8 had limitations. Furthermore, those limitations persist in the data.
Problem Statement Template

- Clarification suggestions to serve as a template
- Does not reflect specific PDT recommendations
- Should be further refined based on discussion of PDT questions/discussion points
The Council acknowledges user group conflict resulting from the competing stakeholder interests of harvesting Atlantic herring by the directed fishery versus maintaining herring in the ecosystem as prey for other user groups.

The Council will limit alternatives in this action to the geographical extent of the year-round Herring Inshore Midwater Trawl Restricted Area that the Council recommended through Amendment 8 (A8) (see enclosed map).

Within this area, the Council will explore possible detrimental biological and socioeconomic impacts related to the availability of Atlantic herring.

This includes examination of:

- The ecosystem role of Atlantic herring as a prey for other species,
- The incidental catch of river herring, shad, and haddock by the Atlantic herring fishery, and
- Updated data on activity and catch by all Atlantic herring resource user groups.

Spatial and temporal variations of the former A8 area would be developed as alternatives to address Atlantic herring resource user group conflicts between the directed fishery and other stakeholders.
Draft Problem Statement

The Council intends to explore possible detrimental biological and socioeconomic impacts of user group conflicts related to availability of Atlantic herring through examination of the ecosystem role of Atlantic herring in the area included in Amendment 8 exclusion zone, Atlantic herring as prey for other species in this area, the incidental catch of river herring and shad and other species in this area, updated data on activity by all users in this area, and spatial and temporal variations on the Amendment 8 buffer zone that could address the concerns of the herring fishery and other stakeholders.
Herring Committee Tasking Motions

From April 12 Herring Committee Meeting:

1. The Committee tasks the Plan Development Team to characterize the bathymetry of the previously approved buffer zone and configuration of midwater trawls to better understand potential gear interactions on the demersal species/habitat based on deployment depth of midwater trawl nets (both single and pair trawl).

2. The Committee tasks the Plan Development Team to examine the Northeast Fisheries Observer data and determine the percentage of fishing activity (tows/haul backs) that occur during daylight hours versus at nighttime (by gear type).

PDT Question: Should the tasking be adjusted to match the Committee's draft problem statement?
**Committee Motion:** The Committee tasks the Plan Development Team to characterize the bathymetry of the previously approved buffer zone and configuration of midwater trawls to better understand potential gear interactions on the demersal species/habitat based on deployment depth of midwater trawl nets (both single and pair trawl).

**PDT Question:** What is the purpose of Task #1? Are there particular species of interest the analysis should focus on?
Tasking Motion 1 PDT Discussion: Data Types/Availability, Limitations

- Broad-scale bathymetry data available
  - May be certain areas where coverage isn't as thorough
  - Can calculate statistics (minimum/maximum/mean depth) by whole area or subset
  - Could split up depth info into state waters and 3-12 miles offshore, use deployment depths for MWT gear to identify bins for bathymetry analysis
- Data re: depth as an environmental covariate available through previous Council staff work on habitat assessments
Tasking Motion 1 PDT Discussion: Data Types/Availability, Limitations

- Observer Program data
  - Vessel location
  - Depth of headrope, bottom depth at haul start
  - Depth range of headrope throughout tow (midwater trawl)
  - Presence/absence of species of interest (ex. Demersal species might indicate contact with seafloor)

- Observer data can be supplemented with data from MWT study fleet, MA DMF portside sampling data (2010-2019)

- Reduced midwater trawl effort in recent years might lead to sparse data
Herring Committee Tasking Motion 2

Committee Motion: The Committee tasks the Plan Development Team to examine the Northeast Fisheries Observer data and determine the percentage of fishing activity (tows/haul backs) that occur during daylight hours versus at nighttime (by gear type).

PDT Questions:

• What geographical extent should be used for the analysis of Task #2?
• Under Task #2, what fishing activity would the Committee like examined – i.e., does this imply directed Atlantic herring fishing using midwater trawls, purse seines, and bottom trawls?
Tasking Motion 2 PDT Discussion: Data Types/Availability, Limitations

- Observer program data
  - Start of haul
  - Start of fishing
  - End of haul
  - Gear back onboard vessel

- Different gear types used at different times (i.e. purse seining occurs at night, bottom trawls (particularly south of Cape Cod) occur during the day, midwater trawls occur both times)

- Temporal element of user group conflict—possible PDT task to determine timing of user group activities requiring herring (i.e. Bluefin tuna fishing)
# Atlantic Herring Fishing Gear Restrictions by State

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<thead>
<tr>
<th>State</th>
<th>Purse Seine</th>
<th>Bottom Trawl</th>
<th>Midwater Trawl</th>
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<tbody>
<tr>
<td>Maine</td>
<td>No restrictions for Atlantic herring</td>
<td>Bottom trawl for herring prohibited</td>
<td>Midwater trawl for herring prohibited</td>
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<tr>
<td>New Hampshire</td>
<td>Purse seining for herring prohibited</td>
<td>Bottom trawl use prohibited</td>
<td>Midwater trawl use prohibited</td>
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<td>Massachusetts</td>
<td>Purse seine use prohibited in certain areas without authorization</td>
<td>Area/seasonal/gear restrictions on trawl use, Night use prohibited</td>
<td>Area/seasonal/gear restrictions on trawl use Night use prohibited</td>
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<tr>
<td>Rhode Island</td>
<td>None</td>
<td>Area/seasonal/gear restrictions on bottom trawl use</td>
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<td>Connecticut</td>
<td>Purse seine use prohibited</td>
<td>Area/seasonal/gear restrictions on trawl use</td>
<td>Area/seasonal/gear restrictions on trawl use</td>
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</table>
Observer Coverage in the Atlantic Herring Fishery by Gear Type, 2012-2022

Table 2a. Number of Midwater Trawl¹, Purse Seine², and Small Mesh Bottom Trawl³ Observed Trips, SBRM (April-March) Years 2012-2022

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Source: DMIS and ODBS databases as of May 24, 2023

¹Midwater Trawl: Includes both single and paired midwater trawl gears
²Purse Seine: Excludes tuna purse seine trips
³Small Mesh Bottom Trawl: Includes bottom trawl gear w/codend mesh size less then 5.5" excluding bottom otter twin trawl, scallop and shrimp trawl trips

NOTE: Includes NEFOP and IFM observer trips w/at least 1 observed haul divided by VTR trips reporting kept catch, and all fisheries using these gear types, not just herring and mackerel fisheries.

*Confidential vessel activity information
Observer Coverage in the Atlantic Herring Fishery by Gear Type, 2012-2022

Table 2b. Number of Midwater Trawl¹, Purse Seine², and Small Mesh Bottom Trawl³ Trips, SBRM (April-March) Years 2012-2022

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Source: DMIS and ODBS databases as of May 24, 2023

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³Small Mesh Bottom Trawl: Includes bottom trawl gear w/codend mesh size less than 5.5" excluding bottom otter twin trawl, scallop and shrimp trawl trips

NOTE: Includes NEFOP and IFM observer trips w/at least 1 observed haul divided by VTR trips reporting kept catch, and all fisheries using these gear types, not just herring and mackerel fisheries.

*Confidential vessel activity information
Table 2c. Midwater Trawl¹, Purse Seine², and Small Mesh Bottom Trawl³ Observer Coverage Rates, SBRM (April-March) Years 2012-2022

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Source: DMIS and ODBS databases as of May 24, 2023

¹Midwater Trawl: Includes both single and paired midwater trawl gears
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³Small Mesh Bottom Trawl: Includes bottom trawl gear w/codend mesh size less then 5.5" excluding bottom otter twin trawl, scallop and shrimp trawl trips

NOTE: Includes NEFOP and IFM observer trips w/at least 1 observed haul divided by VTR trips reporting kept catch, and all fisheries using these gear types, not just herring and mackerel fisheries.

*Confidential vessel activity information
Motion 1: As a statement from the Herring Advisory Panel:

The Council appears to have identified an outcome it wants to achieve – banning MWT gear in the A8 exclusion zone– and is trying to devise a problem statement that would justify that course of action.

The draft Problem Statement indicates the Council intent to “explore possible detrimental biological and socioeconomic impacts of user group conflicts related to availability of Atlantic herring.” While the Court in vacating this action found, “the Secretary could not identify any scientific evidence of localized depletion, let alone establish a link between MWT vessels and localized depletion” and; “the Secretary has failed to identify a rational connection between the facts found and the choice to implement the exclusion zone.”

In their meeting of May 16, a number of PDT members expressed concerns about revisiting this action in a similar manner. Some general comments include: there is a lack of data for the purpose of updating; that they would be unable to demonstrate a conflict; and assessing the biological impact of a user group conflict is impossible with the data they have.

Clearly, there is a need to define what the user conflict is in this action. If the issue is not depletion (localized or not), what is the problem? We do not understand the conflict and do not have an answer to offer here.

In addition, any action which only bars mid-water trawl gear from any part of the herring fishery is an allocation of fishing privileges to others and must comply with National Standard 4. The Council must find that the action promotes conservation, is fair and equitable to all, and that any benefits to others user groups can be meaningfully determined to outweigh the quantifiable loss to the mid-water trawl sector.

Motion 1 carried 5/4/1.
Motion 2: The Herring Advisory Panel recommends that the Herring Committee include in the problem statement the importance of evaluating optimum yield by identifying all user conflicts between Atlantic herring fisheries and other marine resource stakeholders.

Motion 2 carried 5/4/1.
Goal
Manage the Atlantic herring fishery at long-term sustainable levels consistent with the National Standards of the Magnuson-Stevens Fishery Conservation and Management Act.

Objective #5
Provide for long-term, efficient, and full utilization of the optimum yield from the herring fishery while minimizing waste from discards in the fishery. Optimum yield is the amount of fish that will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities, taking into account the protection of marine ecosystems, including maintenance of a biomass that supports the ocean ecosystem, predator consumption of herring, and biologically sustainable human harvest. This includes recognition of the importance of Atlantic herring as one of many forage species of fish, marine mammals, and birds in the Northeast Region.

Amendment 1 (2006)
Amendment 8 Inshore Midwater Trawl Closure

**Goal:** Receive a report from the Plan Development Team and Advisory Panel, suggest revisions to a draft problem statement, and discuss preliminary PDT work on Committee tasking.

**Key Discussion Question:** What revisions does the Committee recommend to the Council regarding the draft problem statement?

**Possible Outcome:** Discussion/Motions
Additional Slides
The Herring Advisory Panel requests that the Herring Committee task the Plan Development Team to analyze the distribution of commercial and recreational fishing, whale watching and herring/mackerel trawling inside Stellwagen Bank National Marine Sanctuary to inform discussions on reestablishing an Inshore Midwater Trawl Restricted Area under Amendment 8.
The Herring Advisory Panel requests that the Herring Committee task the Plan Development Team (PDT) with providing an analysis of fishing patterns (recreational and commercial) within the previously approved Amendment 8 buffer zone area using data available from Vessel Monitoring System (VMS), catch reports, surveys, intercept interviews, and/or other sources deemed appropriate to the PDT. The purpose is to compare activity prior, during and after implementation of the buffer zone.
The Herring Advisory Panel asks the Herring Committee to task the Plan Development Team to gather all known marine mammal survey data from the NEFSC, SBNMS, and other available sources from within the previous Amendment 8 buffer zone out to 12 miles and also out to 20 miles from the coast.
The Herring Advisory Panel asks the Herring Committee to task the Plan Development Team to identify areas of overlap between the previous Amendment 8 buffer zone out to 12 miles and also out to 20 miles from the coast for known locations of herring spawning grounds.
The Herring Advisory Panel asks the Herring Committee to task the Plan Development Team to prepare a summary of the herring management areas history including how and why those area boundaries have changed over time.
The Herring AP requests the Herring Committee task the Plan Development Team (PDT) with compiling data on seabird movements and space use in the previously approved Amendment 8 buffer zone area using data available from at-sea surveys, tracking studies, pelagic birding trip reports, and/or other sources deemed appropriate to the PDT. Where available, also compile information on seabird diets in this region to directly relate seabird activity to the presence of herring.
The Committee tasks the Plan Development Team to characterize the bathymetry of the previously approved buffer zone and configuration of midwater trawls to better understand potential gear interactions on the demersal species/habitat based on deployment depth of midwater trawl nets (both single and pair trawl).

The Committee tasks the Plan Development Team to examine the Northeast Fisheries Observer data and determine the percentage of fishing activity (tows/haul backs) that occur during daylight hours versus at nighttime (by gear type).
Amendment 8

Goals:
- To account for the role of Atlantic herring within the ecosystem, including its role as forage.
- To stabilize the fishery at a level designed to achieve optimum yield.
- To address localized depletion in inshore waters.

Objective: Develop and implement an ABC control rule that manages Atlantic herring within an ecosystem context and addresses the goals of Amendment 8.
Amendment 8: PDT Analyses

- March 25, 2016 PDT Memo
  - Forage needs
  - Footprint of the Atlantic herring and predator fisheries
  - Relationships between catches of herring and predators
  - Potential midwater trawl closures
  - Cod and herring in Ipswich Bay
  - Analytical ideas from public scoping

- August 9, 2016 PDT Memo
  - Mapping herring fishery
  - Herring fishing within specific 30-minute squares
  - Evaluate herring effort inshore
  - Study fleet habitat suitability model
  - Marine Recreational Information Program striped bass data
  - Tuna fishery catch per unit effort
  - Spatial/Seasonal overlap between the midwater trawl herring fishery and predator-focused user groups
  - Localized depletion literature review
Purpose
Receive an overview from the PDT and discuss a potential change in 2023 Council priorities to develop river herring and shad time/area closures.
Motion: That the Herring Committee and the Council consider at their respective next meetings amending 2023 Council Priorities for Atlantic Herring to include Plan Development Team (PDT) tasking for analyses to support and identify a range of options for time/area closures to avoid and minimize catch of river herring and shad in the mid-water trawl and small-mesh bottom trawl fisheries.
Council Discussion – April 20

• Maker of motion: Proposed original Herring Committee motion as an extension of river herring/shad priority rather than connected to Amendment 8. Consideration of hotspots/ time-area closures could become part of A8/ future related framework

• Questions about data availability, concern about responding to 1-2 years of low bycatch data
  • May be premature given that observer program seems to be rebuilding; on the other hand, it's unclear when other funding-contingent programs (IFM, EM/portside monitoring) may come back

• Support for motion intentions, some concern over allocating staff time/ timing of efforts (Amendment 8 work, timing of ASMFC stock assessment)
  • Possible 2024 priority?

• More clearly define goal: to reduce bycatch or to better estimate bycatch?
PDT Discussion

- ASMFC stock assessment: end of 2023
- Management track assessment for Atlantic herring: 2024
- Development of action and analysis could become more complex if catch caps are removed and replaced with time/area closures (rather than adding time/area closures and maintaining catch caps)
- Once in practice, time/area closures may be less complex than monitoring & implementing current catch caps
  - Could be well-suited for herring fishery given current observer coverage/IFM funding
- PDT may develop model of spatial-seasonal distribution of RH/S
- Additional possible approach: PDT develops a discussion document that could lead to a future action
- Committee will need to tie RH/S to problem statement if RH/S actions are going to proceed through revisiting A8 inshore MWT closure
Possible Approaches

Time Estimate to Complete Work
- 6-8 months of Plan Development Team time
- 6-8 Council staff months to prepare document for final action
- 1-2 Council staff months to prepare submission document to GARFO

Questions to Consider when Selecting Approach
- Is the Committee ready for an action at this point or rather looking to explore an issue further?
- What is the intent of the action?
- Should the action be included with other action items or on its own?
- How soon would the Committee prefer the action to be implemented?
Possible Approaches

   a. Complete document in 2023
   b. Postpone work in 2023 on revisiting A8 inshore MWT area action

2. Change priorities for 2023 and initiate a framework action on river herring and shad
   a. Complete in 2023/early 2024, implementation as soon as possible in 2024
   b. Consider postponing work in 2023 and early 2024 on revisiting the A8 inshore MWT area action
Possible Approaches

3. Discuss under priorities for 2024 and possibly include in the specifications action for Atlantic herring in 2024
   a. Completion in 2024
   b. Implementation as soon as possible in 2025
   c. Allows for more time for use of ASMFC's stock assessment of river herring, including any recommendations if applicable

4. Add for consideration under revisiting the A8 inshore MWT area action
   a. Completion unknown at this point
   b. Implementation unknown at this point
   c. Issue not directly related to problem statement as drafted
Motion 3: The Herring Advisory Panel recommends that the Herring Committee discuss river herring and shad time/area closures under priorities for 2024 and possibly include in the specifications action for Atlantic herring in 2024.

Motion 3 carried by consensus and without objection.
Goal: Receive an overview from the PDT and report from the Advisory Panel, and discuss a potential change in 2023 Council priorities to develop river herring and shad time/area closures.

Key Discussion Question: Does the Committee recommend to the Council a change in Council priorities for 2023 to develop river herring and shad time/area closures? If so, the Committee should also address how the suggested change will be reconciled with any resource constraints.

Possible Outcome: Discussion/Motions
Additional Slides
The Herring Advisory Panel requests the Herring Committee tasks the Plan Development Team with evaluating the efficacy of the current methodology used to estimate bycatch (river herring/shad and haddock) under low quotas and low rates of observer coverage in the Atlantic herring fishery, and to evaluate the effects of eliminating/ modifying using the transition rate from Year 1 into Year 2.
The Committee tasks the Plan Development Team to:

(1) Identify river herring and shad catch hotspots using data from UMass Dartmouth’s School for Marine Science and Technology’s River Herring Bycatch Avoidance Program, the Northeast Fisheries Observer Program, genetic marker data for alewife and blueback herring from Reid et al. (2022), Amendment 5 and subsequent actions, and other data sources deemed appropriate by the PDT, and

(2) Use the results to identify a range of options for time/area closures to minimize catch of river herring and shad in the mid-water trawl and small-mesh bottom trawl fisheries. For the purpose of this motion, catch includes bycatch and incidental catch.
Amendment 5

**Goal:** To develop an amendment to the Herring FMP to improve catch monitoring and ensure compliance with the Magnuson-Stevens Fishery Conservation and Management Act (MSA)

**Objectives:**
- To implement measures to improve the long-term monitoring of catch (landings and bycatch) in the herring fishery;
- To implement other management measures as necessary to ensure compliance with the MSA;
- To implement management measures to address bycatch in the Atlantic herring fishery;
- In the context of Objectives 1-3, to consider the health of the herring resource and the importance of herring as a forage fish and predator fish throughout its range.
Amendment 5: PDT Analyses

- Comparison of (landed) Bycatch Estimates from Portside and At-Sea Observer Sampling Programs in the Atlantic Herring Fishery
- Comparison of Portside and At-Sea Sampling Methods of Estimating Bycatch in the Atlantic Herring Fishery
- Impacts of Alternatives Under Consideration in Amendment 5 to Allocate Observer Coverage on Limited Access Herring Vessels
- Identification of River Herring Hotspots at Sea Using Multiple Fishery Dependent and Independent Datasets
- Spatial and Temporal Analysis of River Herring Bycatch in the Northern Shrimp Fishery
- Detailed Analysis of Impacts of Management Measures Under Consideration in Amendment 5 to Address River Herring Bycatch
- Developing River Herring Catch Cap Options in the Directed Atlantic Herring Fishery
- Interactions with Other Measures in Amendment 5
- Discussion Paper: Summary of Available Information and Management Approaches to Address Spawning Atlantic Herring
Amendment 5

The Council’s Preferred Alternative is Alternative 2, Option 4, applied to all limited access herring vessels (Category A/B/C). No exemptions are proposed.
Amendment 5

Table 6 Proposed Action: Additional Measures that can be Implemented through a Framework Adjustment and/or Herring Fishery Specifications Process

<table>
<thead>
<tr>
<th>Add to List of Measures that can be Implemented through a Framework Adjustment</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Adjustments to possession limit for limited access mackerel vessels fishing in Areas 2/3</td>
</tr>
<tr>
<td>• Changes to trip notification requirements and declarations</td>
</tr>
<tr>
<td>• Changes to dealer reporting requirements</td>
</tr>
<tr>
<td>• Adjustments to measures to address net slippage (including sampling provisions, exceptions for trip termination threshold, trip termination threshold amounts/divisions by area and/or gear type)</td>
</tr>
<tr>
<td>• Adjustments to requirements for observer coverage levels</td>
</tr>
<tr>
<td>• Provisions related to industry-funded catch monitoring program (including cost sharing provisions, service provider requirements, waivers)</td>
</tr>
<tr>
<td>• River herring monitoring/avoidance/protection areas</td>
</tr>
<tr>
<td>• Provisions for industry-based bycatch avoidance program, including adjustments to the River Herring Monitoring/Avoidance Areas; the mechanism and process for tracking fleet activity, reporting bycatch events, compiling data, and notifying the fleet of changes to the area(s); the definition/duration of &quot;test tows,&quot; if test tows would be utilized to determine the extent of river herring bycatch in a particular area(s); the threshold for river herring bycatch that would trigger the need for vessels to be alerted and move out of the area(s); the distance that vessels would be required to move from the area(s); and the time that vessels would be required to remain out of the area(s)</td>
</tr>
<tr>
<td>• Changes to criteria/provisions for accessing year-round groundfish closed areas</td>
</tr>
<tr>
<td>• Catch caps/bycatch caps</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Add to List of Measures that can be Implemented through Fishery Specifications</th>
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</table>
## Amendment 5

### Table 158 Biological – River Herring-Focused Trade-offs of Spatial Management Approaches

<table>
<thead>
<tr>
<th>Possible Measure</th>
<th>Positive Impacts</th>
<th>Negative Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fixed Bimonthly Monitoring Areas (Alt.2, Opt.1-3)</strong>&lt;br&gt;Obs. Coverage/CA I Sampling</td>
<td>Areas improve understanding of river herring encounters in the Atlantic herring fishery through focused monitoring.&lt;br&gt;Possible reductions in river herring mortality if fleet avoids the areas.</td>
<td>No impact on river herring mortality, unless the fishery chooses to stay out of monitoring areas.&lt;br&gt;Specific areas monitored instead of across the full range of the species misses important river herring encounters and influences river herring removals estimates.</td>
</tr>
<tr>
<td><strong>Fixed Bimonthly Avoidance Areas (Alt.2, Opt.4)</strong>&lt;br&gt;Two-Phase Avoidance Program</td>
<td>Areas with relatively high river herring encounters are avoided (by time or distance) when river herring are encountered at some threshold level.&lt;br&gt;Likely reductions in river herring mortality.</td>
<td>No river herring mortality protection outside of avoidance areas.&lt;br&gt;Areas outside avoidance areas could have increased rates of river herring encounters by the fishery; if areas selected do not reflect year-to-year variability.</td>
</tr>
<tr>
<td><strong>Fixed Bimonthly Protection Areas (Alt.3, Opt.1)</strong>&lt;br&gt;Closed Areas</td>
<td>Areas provide river herring mortality protection during at-sea migrations by closing specific river herring encounter hotspots.&lt;br&gt;Likely reductions in river herring mortality.</td>
<td>No river herring mortality protection outside of protection areas.&lt;br&gt;Areas outside fixed areas could have increased rates of river herring encounters by the fishery, if areas selected do not reflect year-to-year variability.</td>
</tr>
<tr>
<td><strong>Triggered Bimonthly Protection Areas (Alt.3, Opt.2)</strong>&lt;br&gt;Trigger-Based Closures</td>
<td>Areas provide river herring mortality protection during at-sea migrations by closing specific river herring encounter hotspots upon reaching a trigger.&lt;br&gt;Possible reductions in river herring mortality.</td>
<td>No river herring mortality protection outside of trigger areas.&lt;br&gt;Trigger areas are not put in place quickly enough to be at the pace with river herring migratory patterns.</td>
</tr>
</tbody>
</table>

*This table provides a qualitative comparison of the positive and negative impacts that may result from the alternatives under consideration. The impacts of the no action alternative are discussed in detail in the previous subsections.*

*The Preferred Alternative* in Amendment 5 is represented by the shaded row above.