MEMORANDUM

DATE: June 9, 2023
TO: Herring Committee
FROM: Herring Plan Development Team
SUBJECT: Problem Statement for Revisit A8 Inshore Midwater Trawl Closure; River Herring & Shad

The Herring Plan Development Team (PDT) met on May 16, 2023, by webinar to discuss these topics: (1) **Revisit Amendment 8 Inshore Midwater Trawl Closure** – suggest revisions to a draft problem statement and plan work to address Committee tasking and (2) **River Herring and Shad** – discuss a potential change in priorities to develop river herring and shad time/area closures.

*Atlantic Herring Stock Assessments: 2023-2026:* In consideration of work priorities, the PDT discussed that the Working Group for the Atlantic Herring Research Track commences in July 2023. Five members of the Working Group are also on the PDT. The peer review of the Research Track is scheduled for March 2025. In addition, Management Track stock assessments of Atlantic herring are scheduled for June 2024 and June 2026 to set 2025-2027 and 2027-2029 specifications, respectively.

1. **Revisit Amendment 8 Inshore Midwater Trawl Closure**

On April 20, 2023, the Council passed the following motions:

**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.

---

1 [https://www.fisheries.noaa.gov/event/atlantic-herring-research-track-working-group](https://www.fisheries.noaa.gov/event/atlantic-herring-research-track-working-group)
**PDT Discussion**

The PDT discussed the Council’s draft problem statement, offered some questions for the Committee to consider, and provided some clarification suggestions for revisions.

**Questions/Points for the Committee to Consider:**

1. One definition of a problem statement is: “a description of an issue to be addressed or a condition to be improved upon”\(^2\). It identifies the gap between the current problem and goal. The problem statement should be designed to address the Five W’s\(^3\)” (i.e., who, what, where, when why).
2. 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.
3. 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.
4. 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.
5. What would the measurable benefits be for this action? Are there specific metrics for evaluation?
6. Does “the herring fishery” only refer to the midwater trawl fishery, or are purse seining and bottom trawl fisheries included?
7. 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.
8. 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?
9. 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.
10. The PDT notes the data supporting the analysis conducted for A8 had limitations. Furthermore, those limitations persist in the data.

*Template to Revise the Draft Problem Statement:*

The following suggested text does NOT reflect specific PDT recommendations, rather the PDT offers some clarification suggestions as a template to revise the original Council draft. This should be further refined based on the Committee discussion of the PDT’s questions/points in the preceding section.

\(^2\) [https://en.wikipedia.org/wiki/Problem_statement](https://en.wikipedia.org/wiki/Problem_statement)

\(^3\) [https://en.wikipedia.org/wiki/Five_Ws](https://en.wikipedia.org/wiki/Five_Ws)
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:

1) The ecosystem role of Atlantic herring as a prey for other species,
2) The incidental catch of river herring, shad, and haddock by the Atlantic herring fishery and,
3) 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.
**Herring Committee Tasking**

On April 12, 2023, the Committee sent two analysis tasks to the PDT:

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).

The PDT is seeking clarification from the Committee before it begins its analysis.

- Should the tasking be adjusted to match the Committee’s draft problem statement?
- What is the purpose of Task #1? Are there particular species of interest the analysis should focus on?
- 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?

The PDT did discuss the types of data and information that could be used along with its limitations:

**Task 1:** There is broad-scale bathymetry data available for the area of interest, though there may be certain areas where data is limited. Various statistics describing the area, including minimum, maximum, and mean depth, can be calculated for the entire area or subsets. The Observer program collects a suite of data relevant to this analysis, including vessel location, depth of the head rope at haul start, and the depth range of the head rope throughout a tow. The presence/absence of strictly demersal species collected, which could be noted in observer data, may also indicate whether the gear made contact with the seafloor. Information regarding depth as an environmental covariate is available through previous Council staff work on habitat assessments, which could help provide data on where interactions are occurring with particular species. PDT members noted that the observer data could be supplemented where appropriate with data from midwater trawl vessels participating in the study fleet, as well as MA Division of Marine Fisheries portside sampling data from 2010-2019. However, they did note that, generally, due to a reduction in midwater trawl effort in recent years, data may be sparse.

**Task #2:** The Observer program collects information useful for this analysis, including: start of haul, start of fishing, end of haul, and when gear is back onboard the vessel. The PDT discussed that different gear types are used at different times, specifically that purse seining often occurs at night while bottom trawls, particularly south of Cape Cod, occur during the day, and midwater trawl vessels fish at both times. A temporal element of user conflict was also mentioned, with a potential PDT task being to determine the timing of user group activities requiring herring (i.e., bluefin tuna fishing). A source of uncertainty is if there could be a relationship between the depth of the water column where midwater trawl gear is being used and dispersal rates of herring or predator fish, although there is very little, if any, evidence of that taking place.

The PDT suggested splitting up depth information into state waters and waters from 3-12 miles offshore to get more specific information about each area, as well as possibly identifying bins for the bathymetry analysis using deployment depths for midwater trawl gear. The PDT reviewed
Atlantic herring fishing gear regulations by state in New England (Table 1). A more detailed table is provided in Appendix 1 of this document.

Table 1- Gear restrictions applicable to the Atlantic herring fishery in state waters, Maine to Connecticut.

<table>
<thead>
<tr>
<th>State</th>
<th>Purse Seine</th>
<th>Bottom Trawl</th>
<th>Midwater Trawl</th>
</tr>
</thead>
<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>
</tr>
<tr>
<td>New Hampshire</td>
<td>Purse seining for herring prohibited</td>
<td>Bottom trawl use prohibited</td>
<td>Midwater trawl use prohibited</td>
</tr>
<tr>
<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>
</tr>
<tr>
<td>Rhode Island</td>
<td>None</td>
<td>Area/seasonal/gear restrictions on bottom trawl use</td>
<td>Midwater trawl use prohibited</td>
</tr>
<tr>
<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>
</tr>
</tbody>
</table>

NEFOP staff followed up after the PDT’s discussion with additional information regarding data collected on observed trips:

Observers collect the bottom depth at haul begin on all bottom trawl, midwater trawl, and purse seine trips. On midwater trawl trips, observers collect the depth range of the head rope throughout the haul—electronics on the headrope record the depth during the haul, from which observers can obtain maximum and minimum haul depths from the captain or transducer screen. The date/time data recorded by observers on bottom trawl, midwater trawl, and purse seine trips is as follows:

- **Begin haul**
  - Single midwater, paired midwater (vessel setting gear), and bottom trawl
    - The date/time when the first part of the gear touches the water
  - Paired midwater (vessel acting as the wing)
    - The date/time when the warps are passed from the paired vessel
  - Purse seine
    - The date/time when the first part of the gear or skiff touches the water

- **Begin fish**
  - The date/time when the vessel is done setting out the wire and the gear has begun fishing (not recorded for purse seine)

- **End haul**
  - Single midwater, paired midwater (vessel that is taking the gear), and bottom trawl
    - The date/time when the wenches are engaged with the intention of hauling back the gear
  - Paired midwater (vessel acting as the wing)
- The date/time when the warps are passed back to the paired vessel
- Purse seine
  - The date/time when the purseline is closed off and all rings are brought up alongside the vessel
- Gear onboard
  - The date/time when the gear is completely out of the water (dashed for the wing vessel in a paired midwater trawl)
  - Not recorded on purse seine vessels

The PDT summarized the observer coverage by gear type by year (Table 2).

Table 2- Summary of observer coverage by gear type and year.

A. Number of Midwater Trawl (MW)¹, Purse Seine (PS)², and Small Mesh Bottom Trawl (SMBT)³ Observed Trips, SBRM (April-March) Years 2012-2022

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>MW</td>
<td>160</td>
<td>110</td>
<td>78</td>
<td>21</td>
<td>64</td>
<td>26</td>
<td>7</td>
<td>11</td>
<td>5</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>PS</td>
<td>40</td>
<td>32</td>
<td>17</td>
<td>9</td>
<td>9</td>
<td>10</td>
<td>8</td>
<td>*</td>
<td>*</td>
<td>7</td>
<td>12</td>
</tr>
<tr>
<td>SMBT</td>
<td>321</td>
<td>574</td>
<td>737</td>
<td>611</td>
<td>974</td>
<td>1429</td>
<td>1067</td>
<td>977</td>
<td>73</td>
<td>292</td>
<td>411</td>
</tr>
</tbody>
</table>

B. Number of Midwater Trawl (MW)¹, Purse Seine (PS)², and Small Mesh Bottom Trawl (SMBT)³ Trips, SBRM (April-March) Years 2012-2022

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>MW</td>
<td>395</td>
<td>453</td>
<td>392</td>
<td>398</td>
<td>306</td>
<td>243</td>
<td>170</td>
<td>127</td>
<td>100</td>
<td>19</td>
<td>30</td>
</tr>
<tr>
<td>PS</td>
<td>772</td>
<td>533</td>
<td>457</td>
<td>437</td>
<td>401</td>
<td>583</td>
<td>823</td>
<td>791</td>
<td>858</td>
<td>934</td>
<td>837</td>
</tr>
<tr>
<td>SMBT</td>
<td>7528</td>
<td>7145</td>
<td>7306</td>
<td>6730</td>
<td>8917</td>
<td>8318</td>
<td>7757</td>
<td>6949</td>
<td>5564</td>
<td>5729</td>
<td>4804</td>
</tr>
</tbody>
</table>

C. Midwater Trawl (MW)¹, Purse Seine (PS)², and Small Mesh Bottom Trawl (SMBT)³ Observer Coverage Rates, SBRM (April-March) Years 2012-2022

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>MW</td>
<td>41%</td>
<td>24%</td>
<td>20%</td>
<td>5%</td>
<td>21%</td>
<td>11%</td>
<td>4%</td>
<td>9%</td>
<td>5%</td>
<td>32%</td>
<td>40%</td>
</tr>
<tr>
<td>PS</td>
<td>5%</td>
<td>6%</td>
<td>4%</td>
<td>2%</td>
<td>2%</td>
<td>2%</td>
<td>1%</td>
<td>*</td>
<td>*</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>SMBT</td>
<td>4%</td>
<td>8%</td>
<td>10%</td>
<td>9%</td>
<td>11%</td>
<td>17%</td>
<td>14%</td>
<td>14%</td>
<td>1%</td>
<td>5%</td>
<td>9%</td>
</tr>
</tbody>
</table>

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 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
The PDT provides two example bathymetry maps of the Herring Inshore Midwater Trawl Restricted Area.
2. River Herring and Shad

On April 20, 2023, the Council passed the following motion:

*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.

**PDT Discussion**

Following Amendment 5 (A5), river herring and shad protection areas can be included in a specifications or framework action. Alternatives were developed and analyzed in A5. ASMFC is working on a stock assessment of river herring that is likely to be completed by the end of 2023. A management track assessment is scheduled for Atlantic herring in 2024 for use in 2025-2027. The development of an action and the analysis could become more complex if the catch caps are removed and replaced with time/area closures rather than adding time/area closures and maintaining the catch caps. Another source of complexity could be if lots of options are examined.

Although, in practice as management measures, time/area closures may be less complex than monitoring and implementing the current catch caps in-season. Replacing catch caps with time-area closures may require less complex monitoring efforts, which could be well suited to the herring fishery given current observer coverage and IFM funding. The PDT may develop a model of the spatial-seasonal distribution of river herring and shad using both fishery-dependent and fishery independent data. One challenge is designing time/area measures is the displacement of fishing effort.

Another possible approach could be for the PDT to develop a discussion document on this topic which could lead to a future action.

If river herring and shad time/area closures are going to proceed through revisiting the A8 inshore midwater trawl closure, the Committee will need to tie it into the problem statement.

*Amendment 5 to the Herring FMP:* Amendment 5⁴ to the Herring FMP established several measures to address river herring catch in the Atlantic herring fishery, including: river herring monitoring/avoidance areas, a mechanism for developing a river herring bycatch avoidance strategy, and the ability to consider implementing river herring catch caps for the herring fishery through a future framework adjustment to the FMP. The final Amendment 5 submission included a preliminary analysis of a river herring catch cap, which was later established through Herring Framework Adjustment 3⁵. River herring catch caps were identified as a preferred alternative (in addition to river herring monitoring/avoidance) to reduce river herring bycatch in the Atlantic herring fishery. Additional information from Amendment 5 can be found in Appendix 2 of this document.

---

⁴ [https://www.nefmc.org/library/amendment-5-4](https://www.nefmc.org/library/amendment-5-4)
⁵ [https://www.nefmc.org/library/framework-3-information](https://www.nefmc.org/library/framework-3-information)
Possible Approaches

The PDT developed some possible approaches for the Committee to consider if it decides to recommend a change in priorities and pursue an action on river herring and shad. Further, the PDT outlined some questions to help guide the selection of approach.

1. Is the Committee ready for an action at this point or rather looking to explore an issue further?
2. What is the intent of the action?
3. Should the action be included with other action items or on its own?
4. How soon would the Committee prefer the action to be implemented?

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

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

Time Estimate to Complete Work for an Action on River Herring and Shad
These time estimates represent the minimum time to complete work for an action on river herring and shad. Depending on the complexity of the action these estimates may need to be increased.

- 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
<table>
<thead>
<tr>
<th>State</th>
<th>Purse Seine</th>
<th>Bottom Trawl</th>
<th>Midwater Trawl</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maine</td>
<td>No regulations specific to purse seining for Atlantic herring.</td>
<td>Fishing for Atlantic herring using bottom trawl is prohibited.</td>
<td>Fishing for Atlantic herring using midwater trawl is prohibited.</td>
<td>Regulations restrict use of otter, beam, pair and midwater trawls to fish for Atlantic herring in state waters.</td>
</tr>
<tr>
<td>Source: <a href="#">13-188 CMR Chapter 36</a></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Hampshire</td>
<td>No purse seining for Atlantic herring allowed in state waters. Some purse seining occurs for menhaden under specific regulations.</td>
<td>No bottom trawl allowed in state waters.</td>
<td>No midwater trawl allowed in state waters.</td>
<td>All mobile gear (including but not limited to otter trawls, mid-water trawls, beam trawls, pair trawls, purse seines, Scottish seines, and drag seines) targeting finfish or crustaceans cannot be used in state waters. State waters can be opened or closed to mobile gear use “pursuant to RSA 541-A [Administrative Procedure Act] and consistent with sound conservation and management practices.”</td>
</tr>
<tr>
<td>Source: <a href="#">RSA 211:49, I-II</a></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Massachusetts | • No purse seining in Cape Cod Bay shoreward of a straight line from Sesuit Harbor (Dennis), northerly to the #1 buoy on Billingsgate Shoal, thence northeasterly to Jeremy Point (Wellfleet) without a letter of authorization from the Director  
• Authorized/ permitted vessels may fish with purse seines within seasonal mobile gear closure areas | • Area restrictions for mobile gear use:  
  o Area 1, North Shore Region (year-round closure; permitted vessels may fish within the Area 1A Gloucester/Rockport Exemption, Area 1B Ipswich Bay Exemption; no trawl nets with a sweep/foot rope greater than 80 feet, no trawl nets unless configured with sweep/foot ropes comprised of chain, wire, or discs)  
  o Area 2 Closure, Boston Harbor (April 1-December 31)  
  o Area 3, Hull to Plymouth (May 1-October 31)  
  o Area 4, Plymouth to Provincetown (May 1-October 31)  
  o Area 5, Eastham to Mashpee (May 1-October 31)  
  o Area 6A, Mashpee to Falmouth ½ nautical mile closure (June 1-October 31)  
  o Area 6B, Mashpee to Falmouth ¼ mile closure (April 23-May 31)  
  o Area 7, South Shore of the Elizabeth Islands (May 1-October 31)  
  o Area 8A, Nantucket Island North Shore (April 1-April 30)  
  o Area 8B, Great Point to Nantucket Harbor (June 1-September 15)  
• Mobile gear use prohibited at night  
• Additional trawl gear mesh size regulations: see [MA 322 CMR 4](#) | • Vessels > 72 ft in length are prohibited from fishing in State Waters  
• Vessels > 165 ft in length or > 3000 hp are prohibited from landing herring in Massachusetts  
• Fishery subject to Massachusetts/New Hampshire Spawning Area Closure (See [MA 322 CMR 9](#)) |                                                                                                                                 |
| Source: [322 CMR 4](#), [322 CMR 8](#), [322 CMR 9](#) | Map of Massachusetts Mobile Gear Regulated Areas |                                                  |                                                    |                                                                                                                                     |
| Rhode Island | No regulations specific to purse seineing. | • Trawling devices prohibited in: Upper Narragansett Bay from November 2-June 30 and on any Saturday, Sunday, or legal State holiday from July 1-November 1; Narragansett Bay north of a line extending from the dock at Rocky Point (Warwick) to the southern tip of Poppasquash Point to Hog Island Shoal Light to the north abutment of the Mt. Hope Bridge (Bristol); Upper Sakonnet Marine Life Management Area (the waters of the Sakonnet river north of a line from McCurry Point (Portsmouth) to southern end of Jack’s Island (Tiverton) and south of Sakonnet River Bridge); all coastal salt ponds, except otter trawling in Charlestown Pond and Quonochontaug Pond in accordance with regulations.  
• Otter Trawling prohibited in: Charlestown Pond on Saturdays, Sundays, and legal State holidays f south of a line extending from Marsh Point and Horseshoe Point on the Arnolds shore; west of a line extending from DEM markers located on Marsh Point and Marsh Neck Point; and east of a line extending from the east shore of the Foster Cove channel and a DEM marker located on the barrier beach; Quonochontaug Pond on Saturdays, Sundays, and legal State holidays, south of a line extending from a DEM marker located at the southernmost end of Quahaug Point to the northern end of Nopes (Barn) Island; and east of a line extending south from Quahaug Point to a DEM marker located on the barrier beach; Potter Pond;  
• Otter trawling with a mesh size less than 6” stretched mesh prohibited from December 1 through February 28 in: Narragansett Bay north of a line extending from the easternmost extension of Carrier Pier (North Kingstown) to Conanicut Point (Jamesstown), thence to the tips of the T Pier on Prudence Island to Carr's Point (Portsmouth); In the Sakonnet River north of a line from Sachuest Point (Newport) to Sakonnet Point (Little Compton); In Quonochontaug and Charlestown Pond. | The use of midwater trawl gear is prohibited in the marine waters of Rhode Island. |
| Source: Conn. Agencies Regs. § 26-142a-6; Conn. Agencies Regs § 26-159a-18; CT Marine Fisheries Information Circular | Connecticut Purse seine use prohibited in state waters. | • “Otter trawl fishing” means commercial fishing by use of otter trawls, beam trawls, balloon trawls, midwater trawls, sea scallop dredges or any other device to take and land regulated species other than blue crabs.  
• Trawl gear use is prohibited from March 1-April 14, except use of fly net gear for sea herring;  
• From November 1 to April 30, if a person on a vessel is in possession of 100 pounds or less of winter flounder or 200 pounds or less of summer flounder, they may use a fly net with any size codend mesh to take Atlantic herring. (Additional mesh size regulations: Conn. Agencies Regs. § 26-142a-6;)  
• Otter trawls, beam trawls, and similar devices prohibited in waters shoreward of the Inshore Trawl Line;  
• No vessels longer than 26 feet can trawl north and west of the Offshore Trawl Line;  
• Trawling prohibited from 1 hour after sunset to 1 hour before sunrise west of the LORAN C 14935 line;  
• Trawling prohibited inside a line from the southern tip of the Old Saybrook west breakwater to Buoy R8 to the shoreline at 72 degrees 18 minutes west longitude in Old Lyme from Friday 1 hour after sunset to Sunday 1 hour before sunset;  
• No vessel longer than 44 feet can use trawling devices north of a line running from shore to shore through Buoy C5 at Three Foot Rock in East Lyme and Buoy N6 at Black Rock in Waterford;  
• No vessel longer than 44 feet can use trawling devices west of 73 degrees longitude unless the vessel operator has been authorized to operate a vessel of this size in this area. | Atlantic herring harvest in state waters is prohibited when 100% of the quota for Herring Management Area 2 (Specified by the Atlantic States Marine Fisheries Commission Atlantic Herring FMP) is reached. |
Appendix 2: Management Measures for River Herring Bycatch from Amendment 5 to the Atlantic Herring FMP Final Submission Document

The following rationale recommending river herring monitoring and avoidance measures was presented in the final submission for Amendment 5 to the Atlantic Herring FMP (pg. 67-68):

“Monitoring and avoidance was selected as the goal specific to river herring bycatch in this amendment for several reasons. First, this management goal relates well to the overall goal of the amendment, which is to develop an amendment to the Herring FMP to improve catch monitoring and ensure compliance with the MSA. Monitoring and avoidance are critical steps to better understanding the nature and extent of bycatch in the fishery and working with the industry to minimize it to the extent practicable. Second, this goal promotes cooperation with the industry and acknowledges the need to better understand bycatch problems in order to develop effective solutions. The Council’s selection of management measures to apply to the proposed River Herring Monitoring/Avoidance Areas (Option 4 below) supports this notion as well. Third, this approach is likely to be more effective at this time, given the available information about river herring stock distribution, stock status, and the ability of specific management measures to impact the resource. Information presented to the Council during the development of Amendment 5 (and provided in this document and its appendices) suggests that little is known about the impact of river herring bycatch in the herring fishery on the river herring resource. Moreover, the impacts of area closures (like those proposed under Alternative 3) on the river herring resource are not possible to predict at this time; perhaps even more uncertain is the potential for bycatch to increase outside small areas proposed for seasonal closure. In turn, the Council determined that the most effective measures implemented in Amendment 5 to address river herring bycatch would be those that increase catch monitoring and bycatch accounting, and promote cooperative efforts with the industry to minimize bycatch to the extent practicable.”

The Council suggested an additional preferred alternative that implemented a mechanism to develop a two-phase river herring bycatch avoidance program. This program worked with industry partners, represented by the Sustainable Fisheries Coalition, and Massachusetts Division of Marine Fisheries and UMass Dartmouth School of Marine Sciences and Technology to: identify preliminary bycatch avoidance areas; focus/increase monitoring/sampling in the monitoring/avoidance areas designated in Amendment 5; and ultimately establish a mechanism for adjusting monitoring/avoidance areas and implementing long-term river herring bycatch avoidance strategies through a framework adjustment to the Herring FMP. Phase II of the project would consist of the Council: formally evaluating the project and its results; receiving recommendations from the Herring PDT and Committee to determine whether a follow-up action to implement a long-term river herring bycatch reduction strategy is necessary; conducting an initial framework adjustment meeting to develop management actions if necessary; and, if an action was deemed appropriate, holding a final framework adjustment meeting. Possible measures implemented through such a framework adjustment could include: adjusting monitoring/avoidance areas; specifying the mechanism and process for tracking fleet activity, reporting bycatch events, compiling data, and notifying the fleet of changes to the areas; defining “test tows” if utilized to determine river herring bycatch in an area; identifying the threshold for river herring bycatch that would lead to vessels being alerted to move out of the area; and the
time and/or distance that vessels would be required to move out of the area. The Council included rationale in support of this recommendation (pg. 81):

“The Council selected this option for river herring monitoring/avoidance because it believes that bycatch management and mitigation can most effectively be addressed by the fishing industry on a real-time basis, in cooperation with management. Sustainable Fisheries Coalition (SFC) members account for the majority of US landings of Atlantic herring and mackerel. River herring species are also encountered in these directed fisheries. Minimizing unintended bycatch has been a goal of SFC members since fisheries managers alerted the industry in 2006 that the river herring species complex was depressed. To help achieve this goal the SFC has joined with the Massachusetts Division of Marine Fisheries (MA DMF) and the University of Massachusetts Dartmouth School of Marine Science and Technology (SMAST) to develop river herring and American shad (alosine) bycatch avoidance methods through a pilot project. This collaboration seeks to develop (1) a predictive model of where alosines are likely to occur in space and time, (2) a real-time bycatch avoidance intra-fleet communication system, and (3) additional support for port sampling to inform the initiative.

The goal that the Council adopted for Amendment 5 is river herring monitoring and avoidance. The proposed Monitoring/Avoidance Areas (see more discussion of rationale related to these measures in Section 3.3.2 of this document) will provide a focus for continued work by the SFC through the river herring bycatch avoidance project. The Council intends to further minimize river herring bycatch and bycatch mortality in the future through follow-up management action, including consideration of river herring catch caps. At its November 2012 meeting, the Council identified a framework adjustment to establish river herring catch caps as a management priority for 2013, so the development of these measures is expected to begin shortly after the submission of Amendment 5, during the review/implementation phase.

The management alternatives considered by the Council in Amendment 5 to address river herring bycatch were based on the river herring hotspot analysis developed by the Herring PDT (see details in Appendix IV, V, and VI). The intent of the structure of the alternatives was to better link the configuration of the river herring areas to the goals of the management program. Ultimately, depending on the outcome of the SMAST/SFC program, the Council may advance the goal of river herring monitoring and avoidance by linking the approach proposed in Amendment 5 with a river herring catch cap and providing the industry with the incentive to develop their own approaches to minimizing bycatch and staying under the cap.”
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.

Figure 1: Summary of Amendment 5 Measures Under Consideration to Address River Herring Bycatch. Source: Amendment 5 to the Herring FMP

The Council also indicated that they would consider developing river herring catch caps through a framework adjustment or within herring specifications as a measure to address river herring bycatch, presenting the following rationale in the Amendment 5 document (pg. 94):

“Though Amendment 1 authorized the implementation of measures to address bycatch (including catch caps) through the framework adjustment process, the information and analyses presented in Amendment 5 more specifically address concerns related to river herring and include information to form the basis for implementing a catch cap and the necessary reporting and monitoring provisions to ensure its effectiveness. The measure has been more thoroughly evaluated in Amendment 5, allowing more timely and efficient implementation in the future through the framework adjustment process. The Herring PDT provided a detailed discussion paper addressing the development of river herring catch caps, including a discussion of the potential challenges associated with implementing and monitoring, as well as the potential impacts of catch caps. The Herring PDT’s discussion paper can be found in Volume II of this amendment (Appendix VII) and forms the basis for future development of river herring catch caps through a framework adjustment, or through the herring specifications process.
While data are not robust enough at this time to determine a biologically-based catch cap and/or the potential effects on the river herring stock of such a catch cap, the Council supports establishing this mechanism and considering approaches for setting a river herring catch cap in the herring fishery in as timely a manner as possible. The framework adjustment process can provide the mechanism to implement this cap.

The Council believes that a river herring catch cap would provide a strong incentive for the industry to avoid river herring and help to minimize its overall catch. A river herring catch cap, in combination with the Preferred Alternative for river herring bycatch monitoring/avoidance (Alternative 2, Option 4, see previous discussion in Section 3.3.2.2.4), would form the basis for a long-term approach to managing river herring bycatch similar to that used for managing yellowtail flounder bycatch in the scallop fishery. The Council supports this approach as the most effective, least costly manner to allow the industry to manage its own bycatch.

The Council is aware of the pending ESA determinations for river herring and the potential effects that the determination could have on the herring industry, which is why the Council is also proposing Alternative 2, Option 4 (Two Phase bycatch avoidance approach based on SFC/MAST/DMF project) to address river herring bycatch in this amendment. As data improves, so will the ability to perform analyses to inform management decisions and support effective, long-term management that minimizes bycatch to the extent practicable.”
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>Fixed Bimonthly Monitoring Areas (Alt. 2, Opt. 1-3)</td>
<td>Areas improve understanding of river herring encounters in the Atlantic herring fishery through focused monitoring.</td>
<td>No impact on river herring mortality, unless the fishery chooses to stay out of monitoring areas.</td>
</tr>
<tr>
<td>Obs. Coverage/CA</td>
<td>Possible reductions in river herring mortality if fleet avoids the areas.</td>
<td>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>Areas with relatively high river herring encounter areas are avoided (by time or distance) when river herring are encountered at some threshold level.</td>
<td>No river herring mortality protection outside of avoidance areas.</td>
<td>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>Two-Phase Avoidance Program</td>
<td>Likely reductions in river herring mortality.</td>
<td>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>Fixed Bimonthly Protection Areas (Alt. 2, Opt. 4)</td>
<td>Areas provide river herring mortality protection during at-sea migrations by closing specific river herring encounter hotspots.</td>
<td>No river herring mortality protection outside of protection areas.</td>
</tr>
<tr>
<td>Closed Areas</td>
<td>Likely reductions in river herring mortality.</td>
<td>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>Triggered Bimonthly Protection Areas (Alt. 3, Opt. 2)</td>
<td>Areas provide river herring mortality protection during at-sea migrations by closing specific river herring encounter hotspots upon reaching a trigger.</td>
<td>No river herring mortality protection outside of trigger areas.</td>
</tr>
<tr>
<td>Trigger-Based Closures</td>
<td>Possible reductions in river herring mortality.</td>
<td>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.

Figure 2: Summary table of the positive and negative biological impacts to River Herring for Amendment 5 management alternatives. Source: Amendment 5 to the Herring FMP.

The Amendment 5 final submission document also included some discussion regarding challenges associated with using the proposed spatial management options (pg. 498):

“Spatial management options developed are similar to the areas identified by the survey-based analysis. However, there are many hotspot areas identified as important that are adjacent to the spatial management options. The risk is that future river herring migratory patterns and aggregations may change from recent patterns. For example if river herring distribution centers and/or aggregations shift (e.g. northward due to changing environmental conditions) in the future, these areas may not detect these changes (monitoring/avoidance area) or provide adequate protection (protection areas). With fixed bimonthly Protection Areas, information about catch/bycatch in the herring fishery would not be collected in the areas, nor would there be river herring mortality protection outside of proposed Protection Areas. Therefore, areas outside fixed areas could have increased rates of river herring encounters by the fishery, if areas selected do not reflect river herring year-to-year variability. If fishing effort shifts because of the seasonal
closures, encounters of river herring in the fishery may change from previous observations; the impact of effort shifts cannot be predicted. If river herring distribution centers and/or aggregations shift (e.g. northward due to changing environmental conditions) in the future, these protection areas may not provide positive benefits for river herring unless the areas encapsulate these potential changes in patterns. Likewise, triggered protection areas might not be put in place quickly enough to be at the pace with river herring migratory patterns.”