Atlantic Herring
Spawning Closures
Technical Committee
Review and Recommendations
Presented by Renee Zobel

Presented to ASMFC Atlantic Herring Section
August 4, 2015
<table>
<thead>
<tr>
<th></th>
<th>EM</th>
<th>CM</th>
<th>WM</th>
<th>NH/MA</th>
</tr>
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<tbody>
<tr>
<td><strong>Spawning Closure History</strong></td>
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<tr>
<td><strong>FMP (1993)</strong></td>
<td>4 weeks</td>
<td>4 weeks</td>
<td>4 weeks</td>
<td>3 weeks</td>
</tr>
<tr>
<td><strong>Closure</strong></td>
<td>25%</td>
<td>25%</td>
<td>25%</td>
<td>25%</td>
</tr>
<tr>
<td><strong>Tolerance</strong></td>
<td>Aug. 1</td>
<td>Sept. 1</td>
<td>Sept. 1</td>
<td>Oct. 1</td>
</tr>
<tr>
<td><strong>Default Date</strong></td>
<td>~13 week closure for state waters in Area 1A</td>
<td>20% for Area 1A</td>
<td>August 1 – October 31</td>
<td></td>
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<td></td>
<td>EM</td>
<td>CM</td>
<td>WM</td>
<td>NH/MA</td>
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<td>Closure</td>
<td>4 weeks</td>
<td></td>
<td>4 weeks</td>
<td>4 weeks</td>
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<tr>
<td>Tolerance</td>
<td>20%</td>
<td></td>
<td>20%</td>
<td>20%</td>
</tr>
<tr>
<td>Default Date</td>
<td>Aug. 15</td>
<td></td>
<td>Sept. 1</td>
<td>Sept. 21</td>
</tr>
</tbody>
</table>

| **Amendment 2**       |     |     |     |       |
| Closure               | 4 weeks |     | 4 weeks | 4 weeks |
| Tolerance             | 0%   |     | 0%   | 0%    |
| Default Date          | Aug. 15 |     | Sept. 1 | Sept. 21 |
Sampling Based Closure History

• **Addendum I to Am. 1 (2000):** Two, 50 fish samples within 7 days. Defaults if inadequate sampling.
  - Based on % in gonadal stages III-V spawn herring that are greater than 24 cm

• **Addendum V to Am.2 (2012):** Two, 100 fish samples within 7 days. Defaults if inadequate sampling.
  - Based on % in gonadal stages III-V that have reached:
    - $\geq 23$ and $< 28$ cm with mean GSI of 15
    - $> 28$ cm in length with mean GSI of 20
Goals and Objectives

• FMP (1993), Amendment 1 (1999): “To provide adequate protection for spawning herring and prevent damage to herring egg beds”

• Addendum I of Amendment 1 (2000): “Specific measures which are designed to reduce the exploitation and disruption of herring spawning aggregations, while providing a limited opportunity to harvest herring during that time of the year”

• Amendment 2 (2006): Same goal specified as in Am.1
Goals and Objectives Cont.

• All previous spawning closures were based on expert opinion, literature and public input
• Clarity is needed with respect to the following questions, is the goal to:
  1. Prevent spawning fish from being taken?
  2. Prevent fishing operations that will disrupt spawning activity?
  3. Or both?
Goals and Objectives Cont.

1. Prevent spawning fish from being taken?
   - Amendment 2 considerations:
     - Concerns about the 20% spawning tolerance provision (via public comments and the Law Enforcement Committee)
     - To reduce confusion, a timeframe where there would be no fishing in specific areas was preferred (i.e. zero tolerance provision in spawning closures)
Goals and Objectives Cont.

2. Prevent fishing operations that will disrupt spawning activity?
   • Anecdotal evidence suggests fishing may interfere with the spawning behavior of the herring not caught.
Spawning Closure Parameters

• Closure rules first established in the early 1990s
  – Based on limited data

• The Herring PDT initiated a review of the parameters
  – TC analyzed over 10 years of GSI sampling data to examine effectiveness of the current closures and recommend more appropriate options
Methodology
GSI - Risk Tolerance

• Lower GSI$_{30}$, more precautionary, earlier start

• Suggested GSI$_{30}$ values
  – GSI$_{30}$ 23 - 70% of mature fish spawning
  – GSI$_{30}$ 25 - 80%
  – GSI$_{30}$ 28 - 90%
Default Dates

Predicted Default Closure Dates
WM + MANH spawning areas

- **GSI_{50} = 28**
  - **Oct-17**

- **GSI_{50} = 25**
  - **Oct-04**

- **GSI_{50} = 23**
  - **Sep-25**

Dates:
- Sep 15
- Oct 01
- Oct 15
- Nov 01
- Nov 15
# Length of Closure

<table>
<thead>
<tr>
<th>Study</th>
<th>Years</th>
<th>Methods</th>
<th>Area</th>
<th>Average First Spawning</th>
<th>Average Last Spawning</th>
<th>Average Season Length (days)</th>
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</thead>
<tbody>
<tr>
<td>Boyar et al., 1973</td>
<td>1972</td>
<td>Maturity</td>
<td>MA-NH</td>
<td>Sep 10</td>
<td>Oct 20</td>
<td>40</td>
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<tr>
<td>Cooper et al., 1975</td>
<td>1974</td>
<td>Eggs (scuba)</td>
<td>MA-NH</td>
<td>Sep 29</td>
<td>Oct 25</td>
<td>26</td>
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<tr>
<td>McCarthy et al., 1979</td>
<td>1972-1978</td>
<td>Eggs (scuba, sub, grab)</td>
<td>MA-NH</td>
<td>Sep 20</td>
<td>Oct 30</td>
<td>40</td>
</tr>
</tbody>
</table>
1. Process

- **Sampling data:** Analysis of GSI >10 year sampling data
  
  – GSI_{30} of 23, 25, or 28? Lower number = less risk
  
  – *TC recommends proposed forecasting protocol for spawning closures*
Spawning Closures: TC Recommendations

2. Area

– **Western ME/MA-NH**: TC found no significant difference in timing of spawning
  
  • *TC recommends combining spawning closure areas*

– **Eastern Maine**: Minimal literature and data.
  
  • *TC recommends status quo on area and default start date*
3. Default dates for Western ME/MA-NH

- Under proposed methodology reliance on default dates from a lack of samples should diminish

- *TC recommends median values based on the Sections choice of GSI/risk tolerance*
Spawning Closures: TC Recommendations

4. Length of Closure

• Literature and sampling supports a 40 day closure

• *TC recommends 6 week closure*
Potential Benefits

- Sampling
- Cohesive and transparent closure method
- Advanced Public Notice
- Less reliance on default dates
- Accounting for documented inter-annual variability
Amendment 2 Considerations

- Public comments suggested spawning closures should be based on real-time data, fishermen specifically noted spawning closures occurred too early in some instances and were therefore not very effective.
Additional Consideration

• Forecasted spawning closures may be earlier or later which has potential implications for gear conflicts and gear specific access to various spawning areas
Questions?