



# Atlantic States Marine Fisheries Commission

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## Potential issues and considerations with Georges Bank/Nantucket Shoals off shore spawning area

*Report to the Atlantic Herring Section from the Technical Committee*

### Introduction

Recently a number of managers and stakeholders have suggested that Atlantic herring should have spawning protections both offshore and inshore. Currently, spawning restriction only exists for the inshore component of the Atlantic herring resource and are managed and monitored by the States with direction from ASMFC. However, there are a number of concerns and clarifications the Section may want to address prior to initiating management action through an Addendum or Amendment.

Historically, ASMFC has managed three inshore Gulf of Maine spawning areas; Eastern Maine, Western Maine, and MA/NH (Figure 1). During initial plan implantation the Federal government considered similar options for inshore spawning protection, but these were later disapproved by the regional office of NMFS (NMFS, 2000)

Since plan implementation in 1999 (ASMFC, 2006) and until 2007 a 20% tolerance was put in place to prevent removal of spawning adult fish in the inshore. This tolerance was later rescinded, requiring all directed vessels to harvest in areas other than those closed. Closures for each of the inshore areas are determined either by commercial catch sampling or by predefined default dates (see Addendum V). To determine closures:

*(b) Determination of starting dates for spawning areas.*

*Closures in a given area will begin based on a pre-determined spawning condition of Atlantic herring indicated by commercial catch samples. This spawning condition will be defined as: female herring greater than or equal to 28 cm in length having reached a mean gonadosomatic index (GSI) of 20%; or female herring greater than 24 cm and less than 28 cm in length having reached a mean GSI of 15%. Closures in a given area will begin seven (7) days after the GSI determination is made. If sufficient samples are not available, closures will begin on area specific dates as follows: Eastern Maine- August 15, Western Maine- September 1, Massachusetts/New Hampshire- September 21.*

*(c) Duration of spawning area restrictions.*

*The closure will extend for four (4) weeks. If catch sampling after the end of the initial restricted period determines that 25% or more mature herring, by number, have yet to spawn then the spawning restrictions would resume for an additional two weeks.*

To effectively monitor these rolling closures, states collect 100 fresh fish samples from the commercial fishery in each area prior to and again just after spawning. Fresh samples are obligatory for spawning determination as frozen samples make proper ICNAF staging and GSI determination impossible due to ice crystals formation and water retention in the body and gonads. These samples are more arduous to collect and process, as GSI determination and staging takes place in a laboratory setting, and transport from landing facility and processing has to be completed in 24 hours due to sample degradation. Maine DMR routinely collects 50-75, 100 fish samples a year to determine proper closures and possible extensions. MA DMF personnel collect about one half the samples from the MA/NH Area, as most vessels land in Maine when the Western and Eastern closures are effective.

Implementation of spawning area management for the offshore Georges Bank/ Nantucket Shoals component of the Atlantic herring resource presents some challenges similar to the inshore component of the resource. As such, the TC would like to highlight a number of issues.

### *Issue 1: Goals and Objectives*

The Current goals and objectives as outlined in Amendment 2 are:

- *To harvest the U.S. Northwest Atlantic herring resource consistent with the definition of overfishing contained in Amendment 2.*
- ***To prevent the overfishing of discrete spawning units consistent with the national standards.***
- *To avoid patterns of fishing mortality by age which adversely affect age structure of the stock.*
- ***To provide adequate protection for spawning herring and prevent damage to herring egg beds.***
- *To promote U.S. and Canadian cooperation in order to establish complementary and real-time management practices.*
- *To implement management measures in close coordination with other Federal and State FMPs.*
- *To promote research and improve the collection of information in order to better understand herring population dynamics, biology, and ecology, improve science in order to move to real-time management and to improve assessment procedures and cooperation with Canada.*
- *To achieve full utilization from the catch of herring, including minimizing waste from discards in the fishery.*
- *To maximize domestic use, such as lobster bait, sardines, and other products for human consumption, and encourage value-added product utilization.*
- *To promote the utilization of the resource in a manner, which maximizes social and economic benefits to the nation and taking into account the protection of marine ecosystems and its value as a forage species.*

Of these “To provide adequate protection for spawning herring and prevent damage to herring egg beds.” seems most relevant. However inshore spawning restrictions have been effective in meeting another plan objective “To prevent the overfishing of discrete spawning units consistent with the national standards.” During spawning, sub-components of the complex of Atlantic herring are found on their respective spawning grounds. Given that many of the vessels currently harvesting herring from off-shore areas can switch to purse seining, and that inshore and offshore spawning occurs concurrently; it is likely that spawning restrictions in the off-shore area will move effort inshore as noted in Amendment 2.

#### *4.3.2 Spawning Restrictions*

*Landing restrictions on spawn herring are designed to conserve the stock by ensuring recruitment to the stock. Much of the management program is designed to move effort into the offshore areas where the TAC has not been fully harvested and the spawning component is thought to be strong. The inshore component is the most vulnerable component of the stock complex; therefore, management measures are focused on providing the greatest protection to the component that is thought to be most susceptible to overfishing. **Protection to the offshore spawning component would come at the expense of putting more pressure on the inshore component of the stock complex.***

Given that the general consensus that the meta complex for Atlantic herring is above Bmsy, that the off-shore component of the resources is probably not at full utilization, and that the inshore component may be at or near harvesting capacity, managers will have to clearly state goals and

objectives for implementation. Particularly given that such restrictions may inadvertently lead to increased exploitation on the inshore component just prior to or just after spawning.

### *Issue 2: Data gathering*

As stated previously, fresh samples are needed to monitor spawning areas. However, such samples are not currently available for the off-shore component of the resource. Generally, off-shore and inshore components spawn at roughly the same time, and as such, priority for fresh samples has always been given to the inshore due to ASMFC regulations. Further, the current spawning area management relies on estimations of spawning activity as monitored by GSI. While the relationship between GSI and ICNAF spawning stage are well known for the inshore component, it is likely that the off-shore component will have a different relationship due to differences in growth and maturity schedules. Additionally sampling will also be needed to determine if appropriate default closure dates can be applied, similar to inshore spawning management.

While the Georges Bank Nantucket Shoals component most likely spawns continually during the season (Figure 2), it may have spatial and temporal structure similar the inshore component; requiring subarea management. Sampling will determine if structure is present and how to incorporate that into a management scheme if it is.

Because of the lack of fresh samples from that area, the potential differences between inshore and offshore timing and growth, and the potential need for sub area management, a three year study in most likely required prior to implementation.

### *Issue 3: Funding*

Currently the state of Maine dedicates two half-time technicians and one part time (<15%) analyst during the three month spawning season. These personnel gather and process samples, and analyze the results. These personnel costs, coupled with transport, supplies, overhead etc. translate to approximately \$40,000-\$50,000 a year to monitor the current inshore spawning areas. Given the aerial extent of the proposed off-shore spawning area, a similar additional cost would be expected to monitor an off-shore spawning area.

Monitoring of current ASMFC spawning areas is accomplished using ACCSP, IJF, State of Maine, and State of Massachusetts General funds. However, Atlantic herring has not been listed as a priority species for ACCSP funding for 2013. This coupled with the loss of IJF funding, and reductions in general funds among all the states, suggests current spawning area sampling will not continue in the short term. If off-shore spawning area management and the prerequisite sampling program is to be accomplished, a dedicated long term funding source will need to be identified.

## **Conclusions**

Off-shore spawning area management has been considered previously by both the NEFMC and ASMFC. Such measures may provide benefits to the off-shore component, but would be balanced by a number of trade-offs. Overall it would be feasible to implement a management regime similar to what is conducted for the inshore component; but managers should be aware of important tradeoffs as well as other issues associated

with implementation. Prior to implementation the Section may wish to consider the following;

- 1) Goals, objectives, and potential effort relocation
- 2) Implementing a 3-year study to help define effective management measures
- 3) Identification of potential long term funding sources including federal, ACCSP, and state funds

Once considered, these issues could form that back-bone for further management action or to direct further research on off-shore spawning area management.

### **Literature cited**

NMFS. 2000. Magnuson-Stevens Fishery Conservation and Management Act Provisions; Fisheries of the Northeastern United States; Atlantic Herring Fishery; Atlantic Herring Fishery Management Plan Federal Register. 15 CFR Part 902 50 CFR Parts 600 and 648

ASMFC. 2006 Amendment 2 to the Interstate Fishery Management Plan for Atlantic Herring

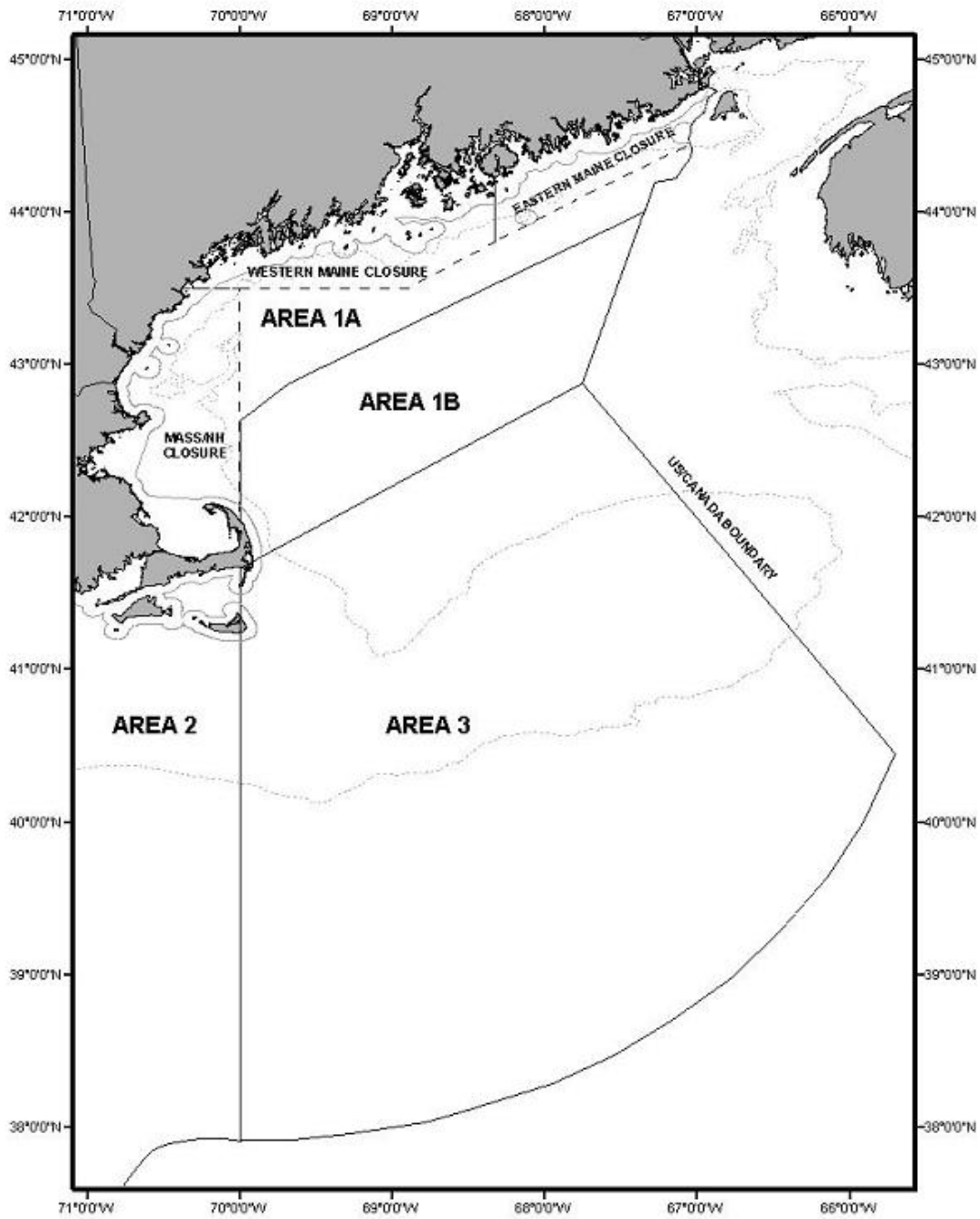


Figure 1: Current Spawning Areas for the Inshore Gulf of Maine

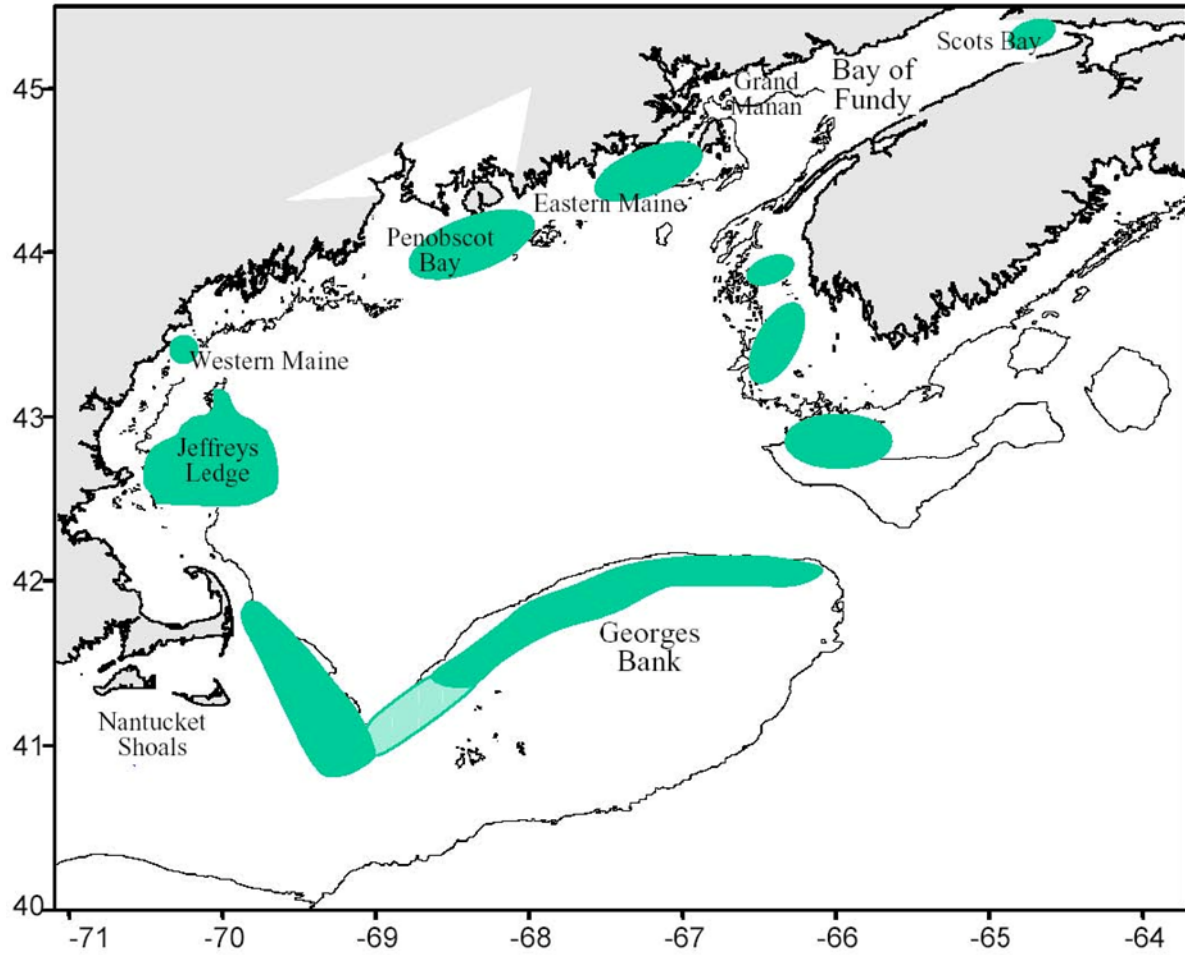


Figure 2: Generalized view of the current major herring spawning areas in the Gulf of Maine and on George Bank (from Overholtz et al. 2004)