

8.0 References

8.1 Public Meetings/Summary of Proceedings

Prior to development of the management plan, a series of scoping hearings was held. After preparation of the DEIS, public hearings were held and a comment period was opened for receipt of written comments. Summaries of all hearings, and written comments (received during the DEIS comment period), are in Appendices VII and VIII. The major comments received, and the Council responses, are summarized below.

1. There is no logical reason to establish a size limit for vessels catching, taking, or harvesting herring in an open access fishery. A large number of vessels less than the size limit can result in over-capacity as easily as the introduction of large factory trawlers. This prohibition targets one vessel that had plans to enter the herring fishery.

The Council believes that the introduction of large factory trawlers would rapidly increase the harvesting capacity in the herring fishery. The introduction of these vessels would also reduce the ability of the herring fishery to serve as an alternative for New England and mid-Atlantic fishermen in other fisheries. Finally, the introduction of such trawlers could have adverse impacts on fishing communities in the area if they displace traditional herring fishermen from the resource or prevent herring processors (such as the sardine canneries) from having ready access to the resource. These potential impacts are discussed in detail in the EIS (section E.7.0). For these reasons, the Council proposes that vessels that exceed the size limits not be allowed into the herring fishery.

The Council's action applies to all large fishing vessels, not just the one vessel that is known to have planned to enter the herring fishery. While the American Fisheries Act makes it more difficult to obtain a fisheries endorsement for the documentation of a new large fishing vessel, the Council believes it does not make it impossible to do so. In addition, this Act does not prevent vessels from other U.S. fisheries from entering the Atlantic herring fishery. The entry of a number of factory trawlers would exacerbate the concerns expressed above.

2. Vessels that exceed the size limit should not be limited to an allocation of herring. These vessels are part of the U.S. processing industry and should have the same access to the resource as shore based processing plants. Herring should not be allocated to foreign joint ventures at the same time that the Council recommends a 0 mt allocation for USAP.

The Council's rationale for specifying the amount of herring that can be processed by large domestic at-sea processing vessels is described in detail in sections E.7.2.5.4, E.1.1.1.1, and E.7.4.2.2.2. The Council believes that large at-sea processing vessels may have adverse impacts on the management of the herring resource that are not clearly understood. There is no history of large domestic processors in any New England fishery, which makes it difficult to evaluate the impacts. As a result, the Council has chosen an approach that will allow the careful introduction of at-sea processing capacity. By creating the USAP specification, the Council can evaluate the impacts of at-sea processors and control their introduction into the fishery.

The decision to recommend that USAP be set at 0 mt for the first year of the management plan will allow the Council to judge the effectiveness of the overall management scheme prior to allowing large domestic at-sea processors into the fishery. The Council does provide an opportunity for foreign joint ventures. This will allow the temporary introduction of processing capacity into the fishery that can be excluded in future years. Unlike the possible impacts of specifying USAP at a level other than 0 mt, foreign joint venture activity will not encourage the development of processing capacity in the U.S. fishery that may be unnecessary.

3. Large factory trawlers should not be allowed into the herring fishery, even as at-sea processors.

The Council's management plan will not allow vessels that exceed the size limits to catch, take, or harvest herring. The plan does provide an opportunity for factory trawlers to enter the fishery by operating as at-sea processors for catcher vessels that meet the size limit. The Council chose this option because there may be a need for large at-sea processors in order to use the offshore herring resource. Recognizing that development of a large vessel offshore processing capability causes concern in local communities that have grown dependent on herring, the Council will control large vessel at-sea processing by specifying the amount of herring that can be processed by these vessels. For the first year of the plan, the Council is taking a cautious approach to the introduction of this processing capacity by recommending this specification be set at 0 mt. The Council believes this balances the concerns of those who oppose large at-sea processors while providing the flexibility to introduce these vessels into the fishery in the future if they will be beneficial.

4. The natural mortality assumed in the herring assessment is inaccurate and the management plan does not adequately account for the importance of herring as a forage species.

The herring assessment is conducted through the peer-reviewed SAW process. Questions on the natural mortality assumptions used in the assessment should be addressed to the SAW.

During development of the FMP, the Council's PDT considered the issue of herring natural mortality (M) and the impact of different estimates of M on stock size. Trial virtual population analyses (VPA) were performed using varying values for M. For M values of 1.0 at age 1, 0.3 at age 2, 0.2 age 3 and 0.1 age 4+, fishing mortality rates increased by 10-15% (compared to the *status quo* M=0.2) in all years between 1967 and 1995, but stock biomass remained the same until 1991-95 when it was slightly lower. For a constant M=0.3 at all ages, F dropped by 5-20% and stock biomass increased over most of the time period, especially during the 1990s. Stock biomass was 33% higher in 1993 for M=0.3, but only 10% higher in 1996. Clearly, fairly small changes in M can have an impact on VPA stock size estimates and fishing mortality rate estimates, but under the most likely scenario (higher M values at younger ages and lower ones at older ages), the results do not change to any significant degree.

Natural mortality rates are an important factor in virtual population analyses (VPA), but

are not required in surplus production models such as the one that is currently being used to estimate maximum sustainable yield (MSY) and fishing mortality and stock biomass at MSY for the Atlantic coast stock complex of herring. Surplus production models incorporate natural mortality, growth, and recruitment into estimates of the intrinsic rate of population increase (r), a population attribute that reflects the balance of all biological factors that cause a population to grow at a certain rate over time. Species interactions are accounted for indirectly in terms of how they affect r , which reflects average population processes over time. Surplus production models do not account for deviations from average conditions, such as would be caused by a very strong year class recruiting to the stock. These models also work in the opposite “direction” as VPA models, i.e., from the oldest years forward to the most recent. Thus, MSY for the herring stock complex is a much more stable parameter than an estimate of the exploitable biomass in the most recent year, or in any given year, and it does not depend on knowing the natural mortality rate.

In addition, the Council has recommended an ABC that is based on B_{MSY} , not the current stock size estimate, which is over twice the size of B_{MSY} . In other words, the Council's recommended OY and TAC is roughly half what could be supported by the estimates of current stock size. The Council chose this precautionary approach because of uncertainty over current stock size estimates and the relative size of spawning components, as well as in recognition of the importance of herring as a forage species.

5. The management plan underestimates DAP and incorrectly allocates herring to JVP. NMFS guidelines require the FMP to include an estimate of DAP. DAP includes "... The amount of U.S. harvest that domestic processors will process. This estimate may be based on historical performance and on surveys of the expressed intention of manufacturers to process, supported by evidence of contracts, plant expansion, or other relevant information." The NMFS guidelines differentiate between capacity of the domestic processing industry, and DAP. The estimate of DAP in this FMP is based primarily on historic processing levels coupled with information obtained during development of the management plan through public hearings and public comment. It is not based on a survey of processing capacity, such as is used in the mackerel fishery. The Council's recommended specification for DAP (184,000 mt, section E.6.4.3.1.1) reflects an 80% increase in recent domestic processing performance. This estimate allows for U.S. processors to nearly double the amount of herring they process from 1997 levels. The Council believes this estimate is sufficient to allow the domestic industry to develop while providing an opportunity for JV and IWP activities.

6. A limited entry or controlled access system should be implemented, particularly in the Gulf of Maine.

One of the management options considered by the Council was a limited entry system. It was not adopted in order to allow the opportunity for some new entrants into the herring fishery. This decision was made in part so that the herring fishery would provide an opportunity for fishermen in other fisheries that are under increasing restrictions. While a limited entry system was not adopted, the Council acknowledged that such a system may be needed in the near future to control fishing effort. In order to implement a limited entry system as quickly as possible, the Council took the unusual step of including a limited

entry system as a possible framework adjustment measure.

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8.3 Glossary

Allowable Biological Catch (ABC) – the amount of fish that can be safely harvested from a stock. It is calculated by applying the target fishing mortality to the estimated biomass size.

Amendment – a formal change to a fishery management plan (FMP). The Council prepares amendments and submits them to the Secretary of Commerce for review and approval. The Council may also change FMPs through a "framework adjustment procedure" (see below). The Commission prepares amendments and submits them to the Commission's Atlantic Herring Section for approval. Implementing regulations are adopted by the states.

Atlantic herring – *Clupea h. harengus*. The species that will be managed by the management plans developed by the Council and the Commission and described in this document. Sometimes referred to as sea herring.

Bycatch - fish that are harvested in a fishery, but which are not sold or kept for personal use. This includes economic discards and regulatory discards. The fish that are being targeted may be bycatch if they are not retained.

Controlled access – a management system that limits the number of participants in a fishery in order to limit the fishing capacity. The system may include entry and exit provisions so that while the total capacity is limited, the actual participants may vary over time. Qualification criteria to enter the fishery may or may not be based on historic participation.

Days –at –sea (DAS) – the total days, including steaming time that a boat spends at sea to fish.

Environmental Impact Statement (EIS) – an analysis of the expected impacts of a fisheries management plan (or some other proposed action) on the environment and on people, initially prepared as a "Draft" (DEIS) for public comment. After an initial EIS is prepared for a plan, subsequent analyses are called "Supplemental".

Exclusive Economic Zone (EEZ) – for the purposes of the Magnuson-Stevens Fishery Conservation and Management Act, the area from the seaward boundary of each of the coastal states to 200 nautical miles from the baseline.

Exploitation rate – the percentage of catchable fish killed by fishing every year. If a fish stock has 1,000,000 fish large enough to be caught by fishing gear and 550,000 are killed by fishing during the year, the annual exploitation rate is 55%.

Fishing effort – the amount of time and fishing power used to harvest fish. Fishing power includes gear size, boat size and horsepower.

Fishing mortality (F) – (see Mortality)

FMP (fishery management plan) – also referred to as a "plan", this is a document that describes a fishery and establishes measures to manage it. The New England Fishery Management Council prepares FMPs and submits them to the Secretary of Commerce for approval and implementation. The Atlantic States Marine Fishery Commission prepares FMPs and implementing regulations are adopted by the states.

Framework adjustments – adjustments within a range of measures previously specified in a fishery management plan (FMP). A change can usually be made more quickly and easily by a framework adjustment than through an amendment. For plans developed by the New England Council, the procedure requires at least two Council meetings including at least one public hearing and an evaluation of environmental impacts not already analyzed as part of the FMP.

Gonadosomatic Index (GSI) – a measure of the stage of spawning condition.

GRT –gross registered tons. Measure of vessel size based on volume.

Internal Waters Processing (IWP) – an operation by a foreign vessel processing fish caught by U. S. vessels. The foreign vessel is located in the internal waters of a state. "IWP" is usually a reference to the fish allocated for these operations.

Joint Venture (JV) - Joint venture means any operation by a foreign vessel assisting fishing by U.S. fishing vessels, including catching, scouting, processing and/or support. (A joint venture generally entails a foreign vessel processing fish received from U.S. fishing vessels and conducting associated support activities.) "JVP" is usually a reference to the fish allocated for joint venture operations.

Limited entry (or access) – a management system that limits the number of participants in a fishery. Usually, qualification for this system is based on historic participation and the participants remain constant over time (with the exception of attrition).

Mortality

Fishing mortality (F) – (see also exploitation rate) a measurement of the rate of removal of fish from a population by fishing. Fishing mortality (F) is that rate at which fish are harvested at any given point in time. ("Exploitation rate" is an annual rate of removal, "F" is an instantaneous rate.)

F_{target} – the fishing mortality that management measures are designed to achieve.

Natural mortality – a measurement of the rate of fish deaths from all other causes other than fishing such as predation, disease, starvation and pollution. The rate of natural mortality may vary from species to species.

Minimum biomass level – the minimum stock size (or biomass) below which there is a significantly lower chance that the stock will produce enough new fish to sustain itself over the long term. If a stock is at this level, fishing mortality must be reduced to as near zero as possible until the stock rebuilds.

Optimum Yield (OY) – the amount of fish which—

(a) will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems;

(b) is prescribed as such on the basis of the maximum sustainable yield from the fishery, as reduced by any relevant economic, social, or ecological factor; and

(c) in the case of an overfished fishery, provides for rebuilding to a level consistent with producing the maximum sustainable yield in such fishery.

Plan Development Team (PDT) – a group of technical experts responsible for developing and analyzing management measures under the direction of the Council or the Commission. Both the Council and the Commission have herring PDTs that usually meet together to discuss the herring plans. The Commission uses the term **Plan Review Team** after a plan is adopted.

Proposed rule – a federal regulation is usually published in the *Federal Register* as a proposed rule with a time period for public comment. After the comment period closes, the proposed regulation may be changed or withdrawn before it is published as a final rule, along with its date of implementation and response to comments.

Rebuilding schedule – a plan to increase the biomass of a fishery stock, based on a target fishing mortality applied over a period of time.

Recruitment – the amount of fish added to the fishery each year due to growth and/or migration into the fishing area. For example, the number of fish that grow to become vulnerable to fishing gear in one year would be recruitment to the fishery.

Regional Administrator – Regional Administrator, NOAA/NMFS Northeast Region, Gloucester, MA.

Secretarial review process – a process which normally takes 140 days from the time the Council submits a plan or amendment to the Secretary of Commerce until its implementation. The Secretary of Commerce reviews and possibly approves the plan or amendment which must meet the National Standards established by the Magnuson Stevens Fishery Conservation and Management Act as well as other federal requirements (the National Environmental Policy Act, the Marine Mammal Protection Act, the Endangered Species Act and other applicable law.)

Spawning component – reference to a group of herring that spawn in a general location. There is evidence herring return to the same areas to spawn. These fish may, in fact,

comprise different "stocks" but the evidence is ambiguous; they are identified as components to allow the development of measures for their protection. A healthy herring resource depends on maintaining spawning in as many areas as possible.

Stock – a grouping of fish usually based on genetic relationship, geographic distribution and movement patterns. A region may have more than one stock of a species.

TAC – the total allowable catch from a stock of fish based on stock size and a specified management objective.

Technical Committee – a group of biologists assembled by the Commission to assess the (herring) resource.

Tolerance – a reference to a management measure used in the original Commission herring management plan. This measure allows fishing in a spawning closure as long as only a certain percentage of the fish caught contain spawn (roe or milt).

VMS – an electronic vessel monitoring system, which may also be used for communications. Previously referred to as a vessel tracking system, or VTS.

9.0 Draft Regulatory Text

Draft regulatory text is contained in Appendix V (Volume II).