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New England Fishery Management Council

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John Pappalardo, *Chairman* | Paul J. Howard, *Executive Director*

**To:** Paul J. Howard, Executive Director  
**From:** Dr. Steve Cadrin, Scientific and Statistical Committee Chairman  
**Date:** October 7, 2008

**Subject: SSC Recommendations on Modified Overfishing Definition Under Consideration in Scallop Amendment 15**

The SSC was asked to review the modified scallop overfishing definition being considered for Scallop Amendment 15. The SSC previously reviewed a similarly modified overfishing definition proposed in Amendment 10 and recommended that the modified overfishing definition “*provides an appropriate scheme for addressing area rotation and protects against the loss of yield due to excessive fishing in open areas. It allows management flexibility both in terms of which areas are opened and the time frame over which the stock is utilized.*”

At their October 6, 2008 meeting, the SSC re-considered a slightly revised definition of overfishing that accounts for spatial and temporal heterogeneity in fishing mortality rate. The SSC reviewed the Council request, an overview presentation, and three background documents:

- 2a. NEFMC memo to SSC, “Review of modified overfishing definition under consideration in Scallop Amendment 15” 25-Sep 2008.
- 2b. D. Hart presentation, “Effects of spatial heterogeneity and area management on fishery reference points, or why the overfishing definition for sea scallops needs to be revised.”
- 2c. Hart, D.H. 2003. Yield- and biomass-per-recruit analysis for rotational fisheries, with an application to the Atlantic sea scallop (*Placopecten magellanicus*). Fish. Bull. 101:44–57.
- 2d. Hoenig, J.M. 2002. Overfishing definitions and control rules for the sea scallop fishery under rotation management. Draft report. 9-May 2002.
- 2e. Hart, D.H. 2001 Individual-based yield-per-recruit analysis, with an application to the Atlantic sea scallop, *Placopecten magellanicus*. Can. J. Fish. Aquat. Sci. 58: 2351-2358.

The SSC was asked to review the modified approach and inform the Council if it should be considered in Amendment 15. In addition, the SSC was asked to identify if there are any modifications or alternatives that should be considered. Based on a technical review of the revised overfishing definition, the SSC developed the following consensus statement.

## SSC Recommendations:

1. The analyses supporting the proposed overfishing definition are scientifically sound and should be considered in Scallop Amendment 15.
2. The spatially adjusted  $F_{\max}$  calculation used in this alternative is more realistic than the conventional  $F_{\max}$  calculation, because it is more compatible with the current area management strategy. For example, there may be an instance under the current overfishing definition in which the overall resource may not be experiencing overfishing, but given the spatial distribution of scallops and the fishery, individual management areas may be experiencing growth overfishing (i.e., producing less than maximum yield-per-recruit), resulting in foregone potential yield.
3. Although  $F_{\max}$  may be a reasonable proxy for  $F_{\text{MSY}}$ , the SSC recommends more explicit consideration of long-term sustainable yield, rather than maximizing yield-per-recruit. For example, aspects of long-term sustainable yield include: non-equilibrium conditions, stock-recruit relationship, conservation of spawning potential, density dependence, and environmental influences; all of which should be monitored as a condition of managing the fishery based on  $F_{\max}$ . Yield-per-recruit is sensitive to changes in the spatial patterns of fishing and the age/size distribution of the catch. Alternatively, an overfishing definition based on spawning-biomass-per-recruit associated with high resource productivity would be less sensitive to changes in the nature of the fishery and would allow flexibility to manage for a variety of management objectives (e.g., optimum yield, economic and social utilities).



New England Fishery Management Council

# Science and Statistical Committee Report

Steve Cadrin, Chair

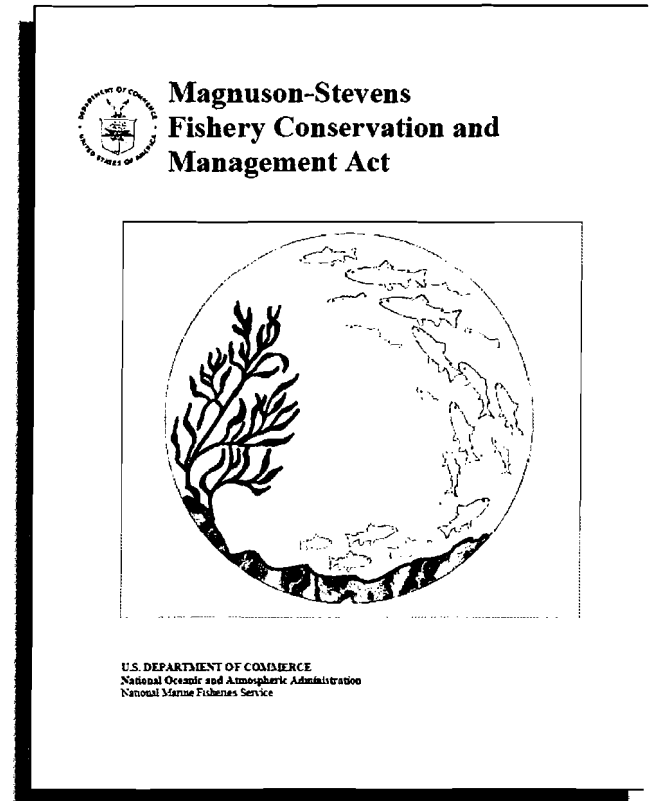
October 2008

# SSC Agenda

- Committee elections
- SSC Process
  - Address committee priorities and workload issues including defining operating procedures for
  - Prepare draft operating procedures in preparation for the national SSC workshop (Nov 12-14)
- Scallop overfishing definition under consideration in Amendment 15 to the Fishery Management Plan
  - Oct 7 memo from SSC to Council
- Amendment 3 to the Skate Fishery Management Plan
- Other requests

# SSC Priorities (draft)

- In the development of annual and monthly agendas:
  - Prioritize Acceptable Biological Catch (ABC) recommendations
  - Prioritize other requests according to:
    - the source of the request (in descending order: from the Council, Executive Committee, Plan Committees, PDTs, other,
    - with the nature of request (consensus, majority, member) explicit in the request.
  - In addition to Council requests, consider larger aspects of the 'spirit of the act' (e.g., ecosystem-based fishery management, socio-economic benefits)



# SSC Procedures (draft)

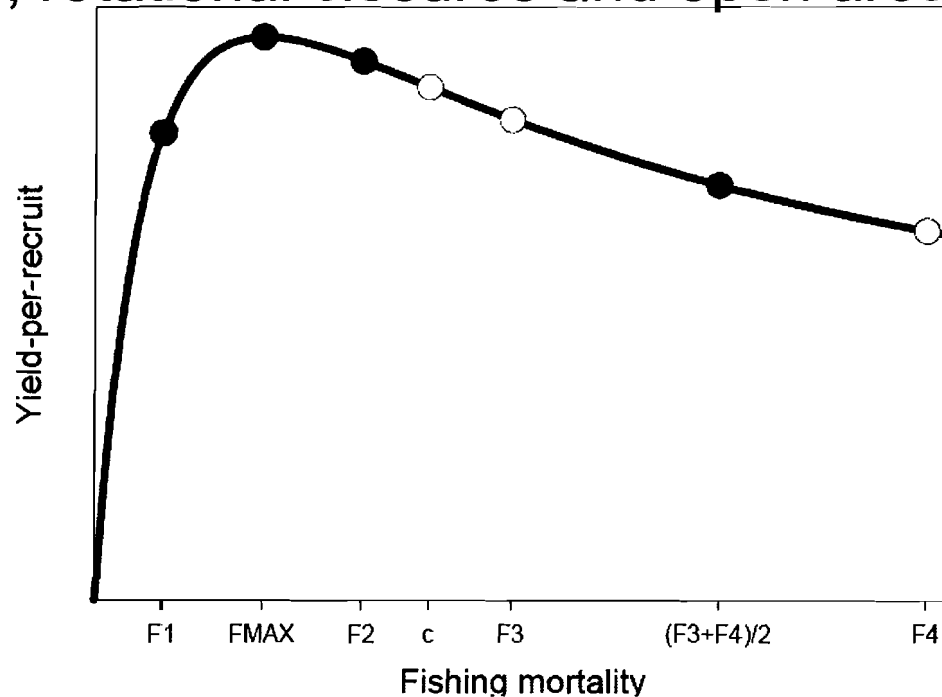
- SSC should meet in conjunction with Council meetings (5/year), others as needed.
- SSC should consider each request one month before the Council deliberates on issue.
- A majority quorum ( $\geq 7/15$ ) should be sought for SSC recommendations.
- SSC recommendations should consensus statements. Consensus statements can identify greatest common perception with caveats.
- As a matter of principle, SSC input in Council decisions is as important as input from Council members. The New England Council should make a statement about compensation for SSC members.

# Scallop Overfishing Definition

- The SSC was asked to review the modified scallop overfishing definition being considered for Scallop Amendment 15.
- The SSC previously reviewed a similarly modified overfishing definition proposed in Amendment 10 and recommended that the modified overfishing definition “*provides an appropriate scheme for addressing area rotation and protects against the loss of yield due to excessive fishing in open areas. It allows management flexibility both in terms of which areas are opened and the time frame over which the stock is utilized.*”
- The SSC re-considered a slightly revised definition of overfishing that accounts for spatial and temporal heterogeneity in fishing mortality rate.
- The SSC reviewed the Council request, an overview presentation, and three background documents.

# Scallop Overfishing Definition

- Maximum yield-per-recruit is produced by fishing the entire resource at a constant rate of  $F_{max}$ .
- Variation in  $F$  produces less than the expected yield-per-recruit for the entire resource.
- Modified calculation considers spatial variation (permanently closed areas, rotational closures and open areas).





# Scallop Overfishing Definition

- Recommendations (Oct 7 SSC memo):
  1. The analyses supporting the proposed overfishing definition are scientifically sound and should be considered in Scallop Amendment 15.
  2. The spatially adjusted  $F_{\max}$  calculation used in this alternative is more realistic than the conventional  $F_{\max}$  calculation, because it is more compatible with the current area management strategy. For example, there may be an instance under the current overfishing definition in which the overall resource may not be experiencing overfishing, but given the spatial distribution of scallops and the fishery, individual management areas may be experiencing growth overfishing (i.e., producing less than maximum yield-per-recruit), resulting in foregone potential yield.

# Scallop Overfishing Definition

- Recommendations (Oct 7 SSC memo):
  3. Although  $F_{\max}$  may be a reasonable proxy for  $F_{\text{MSY}}$ , the SSC recommends more explicit consideration of long-term sustainable yield, rather than maximizing yield-per-recruit.
    - For example, aspects of long-term sustainable yield include: non-equilibrium conditions, stock recruit relationship, conservation of spawning potential, density dependence, and environmental influences; all of which should be monitored as a condition managing the fishery based on  $F_{\max}$ .
    - Yield-per-recruit is sensitive to changes in the spatial patterns of fishing and the age/size distribution of the catch. Alternatively, an overfishing definition based on spawning-biomass-per-recruit associated with high resource productivity would be less sensitive to changes in the nature of the fishery and would allow flexibility to manage for a variety of management objectives (e.g., optimum yield, economic and social utilities).

# Skate FMP Amt 3 (draft)

- Intention of Amt 3:
  - Overfished status of smooth, thorny and winter skates
  - Overfishing of thorny skate
  - Implementation of annual catch limits (ACLs) and accountability measures (AMs)
  - The need to revise the baseline review process
- SSC will report to the Council at the November Council meeting.

