



New England Fishery Management Council

50 WATER STREET | NEWBURYPORT, MASSACHUSETTS 01950 | PHONE 978 465 0492 | FAX 978 465 3116

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

To: Paul J. Howard, Executive Director
From: Dr. Steve Cadrin, Chairman, Scientific and Statistical Committee
Date: September 23, 2009

Subject: Acceptable Biological Catch (ABC) value for the Gulf of Maine / Georges Bank Atlantic herring complex

The Scientific and Statistical Committee (SSC) was asked to review the available information provided by the Herring Plan Development Team (PDT) and develop recommendations regarding the specification of acceptable biological catch (ABC) for the 2010-2012 fishing years, as well as an ABC control rule. On August 11 and September 16 2009, the SSC reviewed several sources of information and associated presentations by the Herring Plan Development Team (PDT):

1. 2006 TRAC Benchmark Assessment Proceedings
2. 2006 TRAC Benchmark Assessment Status Report
3. 2009 Herring TRAC Update Assessment Document
4. 2009 Herring TRAC Update Assessment Status Report
5. July 28, 2009 Memo from Herring PDT: Atlantic Herring Assessment Results and Preliminary Guidance Re. Specification of Allowable Biological Catch (ABC)
6. Herring PDT Discussion Paper: Projected Landings and Stock Biomass Under Different Fishing Mortality Scenarios for Atlantic Herring
7. Herring PDT Memo: Atlantic Herring Overfishing Definition – Proposed Modification to Control Rule
8. Herring PDT Memo: PDT Recommendations for Specifying Atlantic Herring ABC for the 2010-2012 Fishing Years
9. Report of the Retrospective Working Group (NEFSC Reference Document 09-01)

The SSC endorses the 2009 stock assessment produced by the Transboundary Resources Assessment Committee (TRAC) as a basis for projection, derivation of overfishing limit (OFL) and Acceptable Biological Catch (ABC) but recognizes considerable uncertainty in the assessment. Two aspects of the uncertainty in the assessment influence the derivation of OFL and ABC: 1) The assessment has a strong ‘retrospective pattern’ in which estimates of stock size are sequentially revised downward as new data are added to the assessment; and 2) Maximum sustainable yield reference points estimated from the biomass dynamics model are inconsistent with the age-based, stochastic projection; such that fishing at the current estimate of F_{MSY} is expected to maintain equilibrium biomass that is less than the current estimate of B_{MSY} . Given the magnitude of uncertainty in the herring assessment and reference points, an ABC control rule cannot be derived at this time, and the SSC recommends a new benchmark assessment of herring as soon as possible. The SSC suggests that the next benchmark assessment should revise MSY reference points to be consistent with the assessment method and consider including estimates of consumption and spatial structure in the assessment.

The SSC requires further clarification of the PDT's proposed revision to the overfishing definition before it can recommend a revision to the Council. Therefore, the SSC based its OFL calculation on the existing overfishing definition (The maximum fishing mortality threshold is F_{MSY} when stock size is greater than B_{MSY} , and the fishing mortality that allows rebuilding in five years when biomass is less than B_{MSY}). The 2008 estimate of biomass is substantially greater than the biomass expected from long-term stochastic projection at F_{MSY} . Accordingly, the SSC's calculation of OFL is based on F_{MSY} projections.

Given the substantial uncertainty in the assessment, the SSC based its ABC recommendation on two general approaches that produce consistent catch advice: 1) uncertainty in OFL and 2) a magnitude of removals that appears to sustain a relatively abundant stock. National Standard 1 Guidelines suggest that ABC should be less than OFL, and that the 'buffer' between OFL and ABC should account for scientific uncertainty. The average retrospective inconsistency in the estimate of exploitable biomass is approximately 40%, and according to the 2009 TRAC, "uncertainty due to model configuration is dwarfed by uncertainty due to retrospective bias." Therefore, the SSC considers that the magnitude of retrospective inconsistency accounts for the major sources of uncertainty in the assessment, and the buffer between OFL and ABC should be 40% (approximately 90,000 mt in 2010). Alternatively, the stock assessment suggests that recent catches have maintained a relatively abundant stock size (estimates of stock biomass from 1998 to 2008 have been greater than B_{MSY}) and low fishing mortality (estimates 1998 to 2008 fishing mortality have been less than F_{MSY}). Total catch of the Gulf of Maine / Georges Bank herring complex by U.S. and Canada in 2008 was 90,000 mt. Given the consistency in catch advice from these two approaches, the SSC's recommendation is that ABC should be 90,000 mt each year until the stock assessment is revised.

The SSC recommends that:

- 1. The Overfishing Limit (OFL) is 145,000 mt in 2010, 134,000 mt in 2011 and 127,000 mt in 2012 based on projections of fishing at the current estimate of F_{MSY} .**
- 2. Acceptable Biological Catch (ABC) is 90,000 mt each year for 2010 to 2012.**
- 3. Catch recommendations include combined U.S. and Canadian catch of the Gulf of Maine / Georges Bank Atlantic herring complex.**
- 4. A new benchmark assessment should be scheduled as soon as possible to address sources of uncertainty, re-estimate MSY reference points and consider including estimates of consumption and spatial structure in the assessment.**