

## **Section 1**

### **1.1 Introduction**

The Groundfish Assessment Review Meeting (GARM) is a regional peer review process developed in 2002 to provide assessment updates for the stocks managed under the Northeast Multispecies Fishery Management Plan (Multispecies FMP). The first meeting (GARM I) occurred during October 8-11, 2002, in Woods Hole, Massachusetts. The GARM is distinct from the Northeast Stock Assessment Review Committee (SARC) process, which produces “benchmark” stock assessments. The purpose of the GARM is to provide assessment updates, using existing model formulations and data sources. The goals of the GARM are to provide peer review of assessment updates, summarize stock status for individual components and the resource as a whole, and provide estimates of adjustments in fishing mortality rates, as necessary, to achieve biological reference points. The GARM provides comments and recommendations regarding specific stock assessments and generic data collection and analysis procedures.

#### Background and History

In the Northeast region, stock assessments are peer reviewed through the Northeast Regional Stock Assessment Workshop (SAW) process. The SAW provides for a thorough review of new or revised stock assessments. Many stocks are reviewed every two to five years. In addition, the transboundary Georges Bank stocks of cod, haddock and yellowtail flounder are jointly assessed by Canadian and US scientists at regular meetings of the Transboundary Resource Assessment Committee or TRAC. Since the SAW cannot reassess every stock every year, the assessment peer review process also includes more frequent stock assessment updates to ensure that management actions are based on the most recent status information available.

There are 12 species of groundfish, comprising 19 distinct stocks, managed under the New England Fishery Management Council’s Northeast Multispecies Fishery Management Plan (Groundfish FMP). The status of 11 stocks in the complex was updated in 1999 (NEFSC 2000), and the status of 19 stocks was updated in 2000 (NEFSC 2001) to provide current status information relevant to annual management adjustments.

The status of 20 stocks was updated at GARM I (NEFSC 2002a) with the inclusion of Gulf of Maine winter flounder. GARM II reviewed assessments for 19 stocks, one less stock compared to GARM I. Following the completion of the assessment update at GARM I, SAW 36 reviewed a proposed combined Southern New England–Mid Atlantic assessment of yellowtail flounder and concluded that these should be assessed as a single unit stock. SAW 36 also reviewed a revised Cape Cod yellowtail flounder assessment that included additional areas in the Gulf of Maine and concluded that the Gulf of Maine/Cape Cod yellowtail flounder should be assessed as a single unit stock.

SAW 36 also reviewed a Gulf of Maine winter flounder VPA-based assessment developed by the ASMFC Technical Committee, and this assessment approach is included in the present GARM II update.

## **1.2 Terms of Reference**

Terms of reference for the meeting were:

Using models or proxy methods employed at the 2002 Groundfish Assessment Review Meeting (GARM) and subsequent SARC or TRAC meetings for the stocks listed below:

- (a) provide updated catch information (landings and discards, where appropriate) for the stocks to be assessed. Catch-at-age data (based on port sampling) will be estimated, where applicable,
- (b) provide updated research vessel survey indices (through spring 2005) for all appropriate survey series, including NMFS spring and autumn series, Canadian series, and state survey series,
- (c) for stocks where sufficient data are available, estimate 2004 fishing mortality rates and spawning stock biomass, and provide estimates of 2005 stock sizes and associated measures of uncertainty,
- (d) for the remaining stocks where sufficient landings and survey data are available, use proxy methods to estimate the 2004 exploitation ratio and biomass index,
- (e) evaluate stock status relative to applicable Amendment 13 biological reference points ( $F_{MSY}$  and  $B_{MSY}$ ;) and relative to Amendment 13 projected  $F$ , biomass and catches.

### 1.3 Participants

The following individuals participated in some or all of GARM II (August 15-19, 2005):

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## 1.4 Assessed Stocks

The GARM reviewed the status of 19 fishery stocks included as the large mesh species complex in the Northeast Multispecies Fishery Management Plan (FMP). Stocks considered at this meeting (and letter designations of order in the report) are:

- A. Georges Bank Cod
- B. Georges Bank Haddock
- C. Georges Bank Yellowtail Flounder
- D. So. New England/Mid-Atlantic Yellowtail Flounder
- E. Gulf of Maine/Cape Cod Yellowtail Flounder
- F. Gulf of Maine Cod
- G. Witch Flounder
- H. American Plaice
- I. Gulf of Maine Winter Flounder
- J. So. New England/Mid-Atlantic Winter Flounder
- K. Georges Bank Winter Flounder
- L. White Hake
- M. Pollock
- N. Acadian Redfish
- O. Ocean Pout
- P. Gulf of Maine/Georges Bank Windowpane
- Q. So. New England/Mid-Atlantic Windowpane
- R. Gulf of Maine Haddock
- S. Atlantic Halibut

## 1.5 Overview

Most stock assessments reviewed at the GARM were routine updates of assessments previously reviewed in the SAW or elsewhere. Accordingly, the details of the analytical stock assessment modeling are not incorporated herein but are described in relevant references. The results are, however, summarized and input data are presented and evaluated.

The GARM meeting incorporated peer reviews by both regional stock assessment scientists (both NMFS and non-NMFS people) and external experts from the New England Fishery Management Council's Statistical and Scientific Committee.

### Review of Amendment 13 Management Measures

Amendment 13 to the NEFMC Multispecies Fishery Management Plan was implemented in May, 2004. A summary of the numerous changes to management measures during 2002 through 2004 was reviewed. Changes in 2002 and 2003 were the result of interim measures that implemented a court order in the case of *CLF et al. v. Evans*. The major changes included a reduction in allocated days-at-sea (DAS), gear changes (including increases in mesh size and limits on the number of gillnets), changes to possession limits,

and changes to seasonal/rolling closed areas. Amendment 13 to the Northeast Multispecies FMP was implemented May 1, 2004. The major change in this amendment was the categorization of DAS into four different categories with limits on how those DAS can be used. Most of the gear changes of the interim rule were continued, seasonal/rolling closed areas remained the same, additional possession limits were adopted, and a DAS leasing program allowed the exchange of DAS between permits. A program was adopted to target yellowtail flounder in Closed Area II. Over the course of 2004, two framework adjustments created additional opportunities to target GB haddock and other healthy stocks.

Recent management changes have complicated the assessment process. The creation of different categories of DAS, and the programs that allow their use to target healthy stocks, complicate the estimation of the catch-at-age – in particular because of the different levels of discards that may occur in each program. At present, landings in the dealer and VTR databases cannot be directly attributed to a particular program. Panelists recommend that an identifier be created that attributes landing information to a specific management program. The full report is included as Appendix I.

#### Review of Ageing Precision and Accuracy

A report was presented describing evaluations of precision and, when possible, accuracy of age data provided for the GARM assessments. These evaluations were based on exercises in which random sub-samples were re-aged and compared against production ageing samples or reference collections. Results indicated high levels of accuracy and precision in age data for Georges Bank stocks of cod and haddock, high levels of precision for Gulf of Maine cod, and reliable levels of age determination consistency for yellowtail flounder, witch flounder, American plaice, winter flounder, and redfish. The full report is included as Appendix II.

#### Stock Assessment Results

Results of the stock assessment updates are provided as fishing mortality rates and biomasses in 2004, relative to management reference points. The biological reference points (F-MSY and B-MSY) are, in most cases, those developed by the Working Group on Re-Evaluation of Biological Reference Points for New England Groundfish (NEFSC 2002b). In one case (white hake) GARM I rejected the analytical stock assessment results (based on an ASPIC surplus production model) and substituted an index-based assessment evaluation and developed appropriate index-based reference points based on the replacement ratio method (NEFSC 2002b) (section 2L). Reference points for Southern New England/ Mid-Atlantic and Gulf of Maine/Cape Cod yellowtail flounder (section 2D and 2E) and Gulf of Maine winter flounder (section 2I) were derived from the analyses reviewed at SAW 36. A detailed summary of each of the 19 stock assessments reviewed at the 2005 GARM is given in Section 2.

## **1.6 References**

NEFSC 2000. Assessment of 11 Northeast Groundfish Stocks through 1999: a report to the New England Fishery Management Council's Multi-Species Monitoring Committee. Northeast Fisheries Science Center Reference Document 00-05, 175 p.

NEFSC 2001. Assessment of 19 Northeast Groundfish Stocks through 2000: a report to the New England Fishery Management Council's Multi-Species Monitoring Committee. Northeast Fisheries Science Center Reference Document 01-20, 217 p.

NEFSC 2002a. Assessment of 20 Groundfish Stocks through 2001. Northeast Fisheries Science Center Reference Document 02-16.

NEFSC 2002b. Final report of the Working Group on re-evaluation of biological reference points for New England groundfish. Northeast Fisheries Science Center Reference Document 02-04. 123 p.