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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:** Steve Cadrin, Chairman, Scientific and Statistical Committee  
**Date:** September 20, 2010

**Subject: Monkfish Biological Reference Points and Interim Acceptable Biological Catch**

The Scientific and Statistical Committee (SSC) was asked to:

- 1) review the 2010 monkfish (goosefish) assessment from the 50<sup>th</sup> Stock Assessment Review Committee (SARC 50), including the recommendations for updating biomass reference points, and the approach to estimating the maximum sustainable yield (MSY) proxy, for purposes of developing an Acceptable Biological Catch (ABC) recommendation for the monkfish resource;
- 2) review the Monkfish Plan Development Team's updated calculation of overfishing limit (OFL) using SARC 50 results; and
- 3) develop a recommendation to the Council for an updated ABC that accounts for uncertainty in the estimate of OFL, including assessment model uncertainties and projection uncertainties.

In March 2009, the SSC concluded "*that the information currently available for monkfish does not support a conventional approach to determining OFL and ABC as provided in National Standard 1 guidelines*" and made the following recommendation to the Council as the ABC control rule for Amendment 5:

*An interim Acceptable Biological Catch should be derived as the product of the average exploitation rate during the recent period of stable or increasing trend in biomass for each management unit and the most recent estimate of exploitable biomass. Therefore, the method of determining ABC should be considered an interim proxy until Overfishing Level of Catch and its uncertainty can be projected*

On August 24, 2010 the SSC reviewed information and associated presentations developed by SARC 50, the Monkfish PDT and previous SSC reports:

- 1) SARC 50 Monkfish Assessment Summary Report
- 2) SARC 50 Monkfish Assessment Report
- 3) Monkfish PDT calculation of OFL and interim rule based ABC, using updated, SARC 50, results, and discussion of sources of uncertainty
- 4) March 2009 SSC Report to the Council
- 5) May 2009 SSC Report to the Council

The SARC 50 stock assessments of the northern and southern monkfish management units were reviewed and considered as a basis for ABC recommendations. The current biomass reference points for monkfish (developed by the 2007 Data Poor Stocks Working Group) are based on the lowest observed stock size as a proxy for the minimum stock size threshold, and average biomass

during the assessment series as a proxy for a rebuilding target. Advances in monkfish stock assessment methods from a data-poor approach to an analytical assessment (based upon the SCALE model) support the transition to biomass reference points that are consistent with MSY. The SCALE model is superior to the previously used survey-based approach because it allows for the integration of a wide array of information and for the exploration of uncertainties. The SARC 50 Panel recommended revised biomass reference points that are based on long-term  $F_{MSY}$  projections, in which the rebuilding target is  $B_{MSY}$ , and the minimum stock size threshold is  $\frac{1}{2}B_{MSY}$ . The SSC endorses the SARC 50 Panel recommendations, but also recommends further consideration of the recruitment assumptions in long-term projections and alternatives to  $F_{max}$  (e.g.  $F_{40\%MSP}$ ) as a proxy for  $F_{MSY}$ . Using the SARC 50 projection methods at  $F_{MSY}$ , the OFL in 2011 is 19,557 mt for the northern management unit and 36,245 mt for the southern management unit.

The SSC also endorses the SARC 50 stock assessment as a basis for status determination. It is important to note that the monkfish management units are not overfished, as determined from either the current biomass reference points or those recommended by SARC 50. Therefore, rebuilding plans are not needed in either area, the ABCs do not need to meet rebuilding objectives, and the biomass reference points do not affect the SSC's recommendations.

Notwithstanding the assessment advances made, the SSC shares the SARC 50 Review Panel's "*serious concerns regarding the high levels of uncertainty throughout the assessment.*" These uncertainties include poor understanding of some important aspects of monkfish biology as well as model uncertainty which results in a large retrospective pattern, particularly in the northern management unit. These same uncertainties affect estimates of the proposed biomass reference points and in turn the calculated values of the OFLs. SARC 50 provided statistical estimates of uncertainty, evaluations of model sensitivity, retrospective inconsistency, and consideration of potential sources of bias. Much of the uncertainty in the assessment appears to result from model specification error, which can be diagnosed but not quantified by statistical measures of uncertainty in the OFL estimates.

The SSC considered ABC recommendations that are based on uncertainty in the OFLs. Although this approach was ultimately rejected by the SSC, all example ABCs that were considered demonstrate the difficulties in adopting the approach. Unfortunately, major sources of uncertainty are not represented in the projected distribution of the OFLs, so ABC cannot be derived from a percentile of the OFL distribution. When a probabilistic approach to ABC is not possible, ABC recommendations could be based on  $75\%F_{MSY}$ . If monkfish ABCs were based on  $75\%F_{MSY}$ , ABC in 2011 would be 15,400 mt for the northern management unit and 28,600mt for the southern management unit, which is near the maximum catch recorded in the northern area and substantially greater than the maximum catch recorded in the southern area. If the retrospective pattern in the northern area continues, an ABC of 15,400 mt in 2011 would produce a fishing mortality that is nearly two times greater than  $F_{MSY}$ . Similarly, a catch based on 75% of the OFL from the 2007 assessment would have produced a fishing mortality in the northern area that was much greater than  $F_{MSY}$ . If stock biomass estimates were adjusted for retrospective inconsistency, ABCs would be reduced by approximately half. These calculations imply that the OFL – ABC buffer needs to be considerably larger than 25% to take account of scientific uncertainties in the monkfish assessments.

The SSC also considered recommendations based upon the current interim ABC control rule developed by the PDT. Using average exploitation rates during the most recent periods of biomass increase (2006-2009 in the northern area; 2002-2009 in the southern area) and the most recent



estimate of exploitable biomass from SARC 50, 2010 ABC is 7,592 mt in the northern area and 12,316 mt in the southern area. These are about 40% and 34% of the OFLs for the northern and southern areas NMA and SMA respectively and highlight the large uncertainties in the assessments.

Given continued concerns about the monkfish assessment and the difficulties in evaluating uncertainty in the OFLs, the SSC repeats its previous conclusion that *“the information currently available for monkfish does not support a conventional approach to determining OFL and ABC as provided in National Standard 1 guidelines.”* Furthermore, the SSC concludes that the current ABC control rule, updated to reflect recent average exploitation rates and stock sizes, is a more appropriate basis for ABC recommendations than the OFL projections.

The SSC notes that the recommended ABCs are approximately twice the 2009 catch. The SSC thus recommends that the Council consider Annual Catch Targets that allow incremental increases in catch while monitoring stock response. Improvements are needed in the scientific basis of fishery management for monkfish to support catch advice that is based on estimates of scientific uncertainty and the Council’s desired risk tolerance.

**The SSC recommends:**

- 1. Biomass reference points for monkfish should be based on maximum sustainable yield expectations (i.e., a rebuilding target of  $B_{MSY}$  and a minimum stock size threshold of  $\frac{1}{2}B_{MSY}$ ) in the next framework adjustment or amendment to the fishery management plan.**
- 2. Based on projections from the most recent peer reviewed stock assessments, the overfishing limit (OFL) is 19,557 mt for the northern management unit and 36,245 mt for the southern management unit. However, the calculated values of OFL are highly uncertain, and are affected by major sources of uncertainty in the assessment that currently cannot be quantified.**
- 3. Acceptable Biological Catch (ABC) cannot be derived from uncertainty in OFL estimates. Using the currently accepted ABC control rule, ABC is 7,592 mt in the northern area and 12,316 mt in the southern area.**
- 4. Annual Catch Targets should allow incremental increases in catch above 2009 levels while monitoring stock response.**





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**To:** Paul J. Howard, Executive Director  
**From:** Steve Cadrin, Chairman, Scientific and Statistical Committee  
**Date:** September 20, 2010

**Subject: Acceptable Biological Catch for Framework 22 to the Scallop Fishery Management Plan**

The Scientific and Statistical Committee (SSC) was asked to:

- 1) Review relevant aspects of the recent scallop assessment as they pertain to setting Acceptable Biological Catch (ABC) in the Scallop Fishery Management Plan.
- 2) Provide the Council with an ABC recommendation, based on the previously approved ABC control rule, for inclusion in Framework 22 (fishing years 2011 and 2012).

Based on the previous SSC recommendation for an ABC control rule, Amendment 15 states that *“the specific ABC control rule that will be used for the Scallop FMP will be based on setting ABC equivalent to the fishing rate that has a 25% probability of overfishing. These analyses will be based on a stochastic estimate of  $F_{max}$  that will be prepared by the Scallop PDT prior to each specifications package.”*

On August 25, 2010 the SSC reviewed information and associated presentations developed by the 50<sup>th</sup> Stock Assessment Workshop (SAW), the Scallop Plan Development Team (PDT) and previous SSC reports:

- 1) Scallop Terms of Reference memo
- 2) September 23, 2009 Report from the SSC
- 3) Quantifying the tradeoff between precaution and yield in the U.S. sea scallop fishery (D. Hart)
- 4) Sea Scallop Assessment Summary for 2010 (SAW50)
- 5) Draft Framework 22 measures under consideration
- 6) Scallop PDT recommendations for 2011 and 2012 ABCs

The SSC reviewed the SAW50 and PDT analyses and concluded that they provide the information needed for ABC recommendations. The SSC endorses the SAW50 Review Panel recommendation to define overfishing on the basis direct estimates of  $F_{MSY}$ , as intended in the Magnuson-Stevens Fishery Conservation and Management Act. The transition from using  $F_{max}$  as a proxy for  $F_{MSY}$  is consistent with the October 2008 advice from the SSC: *“Although  $F_{max}$  may be a reasonable proxy for  $F_{MSY}$ , the SSC recommends more explicit consideration of long-term sustainable yield, rather than maximizing yield-per-recruit.”* The SSC considers the SAW50 estimate of  $F_{MSY}$  to be based upon best scientific information available for management of the scallop fishery.

While some uncertainties are not accounted for in the stochastic analysis (e.g. spatial heterogeneity in fishing mortality, uncertainty in the magnitude of total 2010 catch, spatial population structure,

uncertainty in projected biomass, and minor retrospective inconsistencies) , the SSC concludes that the PDT's stochastic evaluation of current fishing mortality and  $F_{MSY}$  is a sufficient basis to derive ABC using the accepted control rule (i.e., 25% probability of overfishing). Note that the 'yield' in the PDT's calculations and the ABC recommendation includes dead discards and incidental mortality. Therefore, the realized frequency of overfishing may be more or less than expected from the risk analysis.

**The SSC recommends:**

- 1. The 50<sup>th</sup> Stock Assessment Workshop and Plan Development Team analyses provide the information needed for Acceptable Biological Catch recommendations. The new estimate of  $F_{MSY}$  is based upon the best scientific information available for management of the scallop fishery**
- 2. Acceptable Biological Catch for the scallop fishery is 31,279 mt in 2011 and 33,234 in 2012.**





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**To:** Paul J. Howard, Executive Director  
**From:** Steve Cadrin, Chairman, Scientific and Statistical Committee  
**Date:** September 20, 2010

**Subject: Technical Review of the Analyses to Support Essential Fish Habitat (EFH) Omnibus Amendment 2**

The Scientific and Statistical Committee (SSC) was asked to:

- 1) Evaluate the appropriateness of the Local Indicators of Spatial Association (LISA) analysis methods for defining clusters of habitats that are vulnerable to fishing effort (' $Z_{\infty}$ ').
- 2) Evaluate the appropriateness of analyses for comparing practicability among management alternatives (the 'Z Net Stock Model').

The Council is currently developing Essential Fish Habitat (EFH) Omnibus Amendment 2. Phase 1 of the Amendment described and identified EFH for each managed species, reviewed the prey species consumed by each managed species, and reviewed non-fishing impacts to EFH. Phase 2 is being developed and includes alternatives to minimize, to the extent practicable, the alteration of habitat from fishing effort.

In order to better inform the alternatives development process and more objectively and analytically compare between alternatives, the Council's Habitat Plan Development Team (PDT) created the Swept Area Seabed Impact (SASI) model. The SSC reviewed the structure and data inputs of the SASI model at two meetings on 18 March 2009 and 9 December 2009 and concluded that "*the Swept Area Seabed Impact model is a technically sound basis for evaluating relative effects of alternative management decisions on habitat impact. However, the data used by the model does not currently have adequate resolution for the model to detect subtle differences in habitat impact among different types of fishing gear... Given the SSC's involvement in providing the Council with recommendations on ecosystem-approaches to fishery management, it would be appropriate for the SSC to review applications of the SASI model for management decisions.*"

On August 25, 2010 the SSC reviewed information and associated presentations developed by the Habitat Plan Development Team (PDT):

- 1) Terms of Reference memo
- 2) SASI Model document Part 1
- 3) SASI Model document Part 2
- 4) Sensitivity analyses
- 5) Spatial analyses Local Indicators of Spatial Associations (LISA) statistics
- 6) Z Net Stock Opportunity Cost Analysis

Two types of spatial analyses have been developed to 1) evaluate status quo management areas and 2) determine which grid cells within the model domain have significantly higher than average  $Z_{\infty}$  scores (an estimate of the habitat alteration that would result from a uniform application of area swept fishing effort data across the model domain) using Local Indicators of Spatial Association (LISA) analysis. A variation of the model was developed to assess the practicability of spatial management measures. This tool, called the Z Net Stock model, incorporates economic value data in addition to area swept data and vulnerability estimates.

The Habitat PDT's analyses may be the most technically advanced attempt to evaluate fishing impacts on habitat, and could be the basis for a broader research and monitoring program. As the SSC recommended in 2009, "*The next stage of development for the SASI model is to ground truth some of the model assumptions. For example, susceptibility of different habitats to different fishing gears should be field tested. Similarly, recovery rates of different energy environments should also be ground truthed. The model is flexible enough to allow for revised susceptibility and recovery information.*" The SSC reviewed the PDT's methods and results at several stages, and no major technical flaws were identified. However, the process would benefit from a more formal peer review of the methodology. Alternative methods, perhaps simpler methods, might perform better for meeting the Council's objectives. Performance of alternative models could be evaluated using simulation.

The alteration of habitat from fishing can be reduced by effort reduction or area closures to protect particularly vulnerable habitats. The PDT's analyses of major fishing gears indicate that effort reductions in the northeast U.S. since 1996 reduced habitat impact by 60%. Under the current management system, regional fishing effort will be constrained by annual catch limits. The alteration of habitat from fishing could be further reduced via time-area management.

The PDT's analyses are useful for identifying areas of habitat that are vulnerable to alteration from fishing and for evaluating area closures. The SASI model identifies locations with habitats that are altered by fishing effort, and the LISA analysis evaluates contiguous areas of these habitats. The SSC concludes that the PDT's methods are valid, and the reported results are realistic. For example, most of the current habitat closures had relatively high  $Z_{\infty}$ . The analysis can be expanded to evaluate the ecological value and role of different habitats in ecosystem and fishery production, but the SSC agrees that the PDT's current analysis is the most appropriate approach for the data that is available at this time. Although alternative spatial methods could be considered, the PDT's analyses appear to be appropriate for the spatial properties of information that is available. The SSC recognizes that habitat data are limited, and data availability varies geographically. Therefore, the PDT's existing measures of data support should be routine diagnostics for determining the information content of spatial results.

The PDT's comparisons of practicability among management alternatives are promising, but can be improved in several areas. The economics of multispecies tradeoffs and utilities are complicated, and anticipating changes in fishing behavior is difficult. Alternative approaches to modeling the effects of closed areas on redistribution of fishing effort for area closure scenarios should be explored. The PDT's methods may help to inform some specific management decisions but are not adequately developed for general application.



**SSC recommendations:**

- 1. The PDT's methods are the most appropriate measure of habitat alteration for the information available to support fishery management decisions.**
- 2. Evaluation of data support should continue to be routinely considered for interpreting results of spatial analyses.**
- 3. Economic analysis for comparing practicability among management alternatives needs more extensive consideration of redistribution of fishing effort.**





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**To:** Paul J. Howard, Executive Director  
**From:** Steve Cadrin, Chairman, Scientific and Statistical Committee  
**Date:** September 20, 2010

**Subject:** **Acceptable Biological Catch Recommendations for Pollock, Georges Bank Yellowtail Flounder, Southern Windowpane Flounder, Northern Windowpane Flounder, Ocean Pout and Gulf of Maine Winter Flounder**

The Scientific and Statistical Committee (SSC) was asked to:

- 1) Consider the pollock assessment results of the 50<sup>th</sup> Stock Assessment Workshop (SAW50) and provide the Council FY 2011 – 2014 Acceptable Biological Catch (ABC) recommendations consistent with the interim control rules adopted in Amendment 16 and the following levels of risk:
  - a. An ABC that has approximately a 40 percent probability of overfishing (i.e. less than a median risk of overfishing) in any single year for FY 2011 – FY 2014.
  - b. An ABC that has approximately a 10 percent probability of overfishing in any single year for FY 2011 – FY 2014.
  - c. Low risk that the stock will be overfished during FY 2011 – FY 2014.
- 2) Review Gulf of Maine winter flounder catches for 2009 and additional survey information collected since the 3<sup>rd</sup> Groundfish Assessment Review Meeting (GARM III) and evaluate whether this information affects the current ABC recommendation. If so, provide an updated ABC recommendation for fishing years 2011 – 2012.
- 3) Review the 2010 assessment of Georges Bank yellowtail flounder from the 2010 Transboundary Resources Assessment Committee (TRAC) and recommend ABCs for the fishing mortality that is consistent with the following rebuilding strategies under Council consideration:
  - a. Rebuild by 2014 with a 75 percent probability of success (this is current approved rebuilding strategy and must be considered as the No Action alternative).
  - b. Rebuild by 2016 with a 50 percent probability of success.
  - c. Rebuild by 2016 with a 60 percent probability of success.
  - d. Rebuild by 2016 with a 75 percent probability of success.
- 4) Review additional survey information, if available, and recommend revised 2011-2012 ABCs for ocean pout, as well as northern and southern windowpane flounder, as appropriate.

On August 25-26, 2010 the SSC reviewed the following information and associated presentations developed by the Groundfish Plan Development Team (PDT), SAW50, GARM III, and the 2010 TRAC for groundfish species:

1. Terms of Reference Memo to the SSC from Paul Howard.
2. Groundfish PDT memo dated August 6, 2010 (with attachments): Multispecies ABCs for 2011-2014
3. Northeast Fisheries Science Center. 2010. 50th Northeast Regional Stock Assessment Workshop (50th SAW): Assessment Summary Report. NEFSC Ref. Do. 10-09.



4. NEFSC 2010. 50th Northeast Regional Stock Assessment Workshop: (50th SAW) Assessment Report.
5. O'Boyle, Robert. 2010. SARC 50 Panel Summary Report.
6. Bell, Michael C. 2010. 50th Northeast Regional Stock Assessment Workshop (50th SAW): reviewer comments.
7. Sullivan, Patrick J. 2010. 50th Northeast Regional Stock Assessment Workshop (50th SAW): reviewer comments.
8. Trzcinski, M. Kurtis. 2010. 50th Northeast Regional Stock Assessment Workshop (50th SAW): reviewer comments.
9. Wheeler, John P. 50th Northeast Regional Stock Assessment Workshop (50th SAW): reviewer comments.
10. Northeast Fisheries Science Center. 2008. Report of the 3rd Groundfish Assessment Review Meeting (GARM III): I. Gulf of Maine Winter Flounder. NEFSC Ref. Doc. 08-16.
11. Transboundary Resource Assessment Committee. 2010. Georges Bank Yellowtail Flounder: TRAC Status Report 2010/03.
12. Assessment of GB Yellowtail Flounder for 2010. TRAC Ref. Doc. XX-XX. When published, will be available at: <http://www2.mar.dfo-mpo.gc.ca/science/TRAC/rd.html>
13. Northeast Fisheries Science Center. 2008. Report of the 3d Groundfish Assessment Review Meeting (GARM III): O.: Ocean Pout. NEFSC Ref. Doc. 08-16.
14. Northeast Fisheries Science Center. 2008. Report of the 3d Groundfish Assessment Review Meeting (GARM III): P.: Gulf of Maine/Georges Bank Windowpane Flounder. NEFSC Ref. Doc. 08-16.
15. Northeast Fisheries Science Center. 2008. Report of the 3d Groundfish Assessment Review Meeting (GARM III): Q.: Southern New England/Mid-Atlantic Bight Windowpane Flounder. Gulf of Maine Winter Flounder. NEFSC Ref. Doc. 08-16.
16. Groundfish PDT memo dated July 13, 2009: Groundfish ABCs/OFLs
17. Groundfish PDT memo dated August 7, 2009: Groundfish ABCs/OFLs

### Pollock

A new benchmark stock assessment was developed for pollock by SAW50. Pollock was previously assessed using a survey index method by GARM III in 2008 and was determined to be overfished and subject to overfishing. In 2009, the SSC established the ABC for fishing years 2010–2012 by applying  $75\%F_{MSY}$  to the most recent 3-year average survey estimate of exploitable stock biomass. The SAW50 assessment is based on an age-structured model, and stock status was revised to not overfished and overfishing not occurring.

The SSC endorses the SAW50 Review Panel's recommendation to accept the revised assessment of pollock as a basis for revising ABC recommendations. However, there were considerable uncertainties in the assessment, an important one being the apparent partial selection of larger and older pollock by the fisheries and surveys (termed 'dome-shaped selectivity'). A domed-shaped selectivity implies that there are fish in the population that are not available to either the fishery or the survey. This could be due to larger Pollock out swimming the survey and fishing gears or to them being in untrawlable or untrawled areas. As a result of the domed - shaped selectivity, only 39% of total stock biomass in 2009 is exploitable, and 61% of total stock biomass is not vulnerable to the fishery. A sensitivity analysis that assumed complete survey retention of large, old pollock (termed 'flat-topped selectivity') resulted in lower biomass estimates and suggests that uncertainty associated with selectivity is greater than statistical estimates of imprecision. However the sensitivity analysis also indicated that the stock is not overfished.

Although sensitivity analyses provide a crude evaluation of uncertainty, they cannot be used to quantify probability of overfishing, as requested in the terms of reference. In June 2009, the SSC concluded that “*in the absence of better information on what an appropriate buffer should be between the OFL and the ABC, a relatively simple ABC and robust specification could be applied to all groundfish stocks, in all stages of rebuilding or long-term maintenance of optimum yield... ABC should be determined as the catch associated with 75% of  $F_{MSY}$ .*” The SSC noted that despite the major changes in stock assessment methods and the change in perception of stock status, the revised estimate of maximum sustainable yield (MSY) is similar to previous estimates.

Using projections from the SAW50 assessment at 75% $F_{MSY}$ , the ABC recommendations are 16,900 mt in 2011; 15,400 mt in 2012; 15,600 mt in 2013; and 16,000 mt in 2014. Scenario analyses indicate that ABCs based on 75% $F_{MSY}$  have low risk of overfishing and low risk of leading to an overfished stock by 2015 if the domed survey selectivity estimated by the SAW50 assessment is true. However, if selectivity is actually flat-topped, ABCs based on the SAW50 assessment and 75% $F_{MSY}$  have high risk of overfishing (risk > 50%) and a moderate risk of leading to an overfished stock by 2015 (risk between 25% and 50%).

**1. The SSC recommends that Acceptable Biological Catch of pollock is 16,900 mt in 2011; 15,400 mt in 2012; 15,600 mt in 2013; and 16,000 mt in 2014.**

Gulf of Maine Winter Flounder

In 2008, GARM III attempted to assess Gulf of Maine winter flounder but none of the alternative assessment models was accepted by the review panel. Panelists concluded that “*...it is highly likely that biomass is below  $B_{MSY}$ , and that there is a substantial probability that it is below  $\frac{1}{2} B_{MSY}$ .*” In 2009, the SSC recommended ABC based on 75% of the most recent three-year average catch (238 mt). In June 2010, the Council approved a motion to ask the SSC to examine any recent fisheries independent and fisheries dependent data collected since GARM III for Gulf of Maine winter flounder and to evaluate whether this new information would affect their current ABC recommendation for Gulf of Maine winter flounder.

Conflicting signals persist in the updated information provided by the PDT which continue to confound attempts to assess the Gulf of Maine winter flounder stock. The PDT developed an alternative approach to deriving ABC that is consistent with the ABC control rule for groundfish and which is based on survey data that have been used to assess Gulf of Maine winter flounder. Area-swept survey estimates of exploitable biomass suggest that the current ABC (238 mt) represents a more conservative exploitation rate than 75% $F_{MSY}$ . The SSC concluded that an area-swept survey approach to deriving ABC may provide a better scientific basis for ABC than the current approach, which is based on recent average catch, and is appropriate for the uncertainties in the data and the possibility that the stock is overfished.

The SSC requested an evaluation by the PDT of candidate ABCs for 2011 based on area-swept survey biomass estimates, including a 75% $F_{MSY}$  option and further exploration of survey data properties (e.g., confidence intervals, geographic distributions, inter-annual variability, trawl mensuration) to be considered by the SSC in November 2010. A benchmark assessment is scheduled for spring 2011, so any revision for ABC would be an interim until a peer-review assessment is developed.



**2. The SSC recommends that a revised interim Acceptable Biological Catch of Gulf of Maine winter flounder in 2011 that is based on area-swept survey biomass be considered.**

Georges Bank Yellowtail Flounder

Georges Bank yellowtail flounder was assessed by the TRAC in July 2010. Based on the new assessment and the rebuilding alternatives under consideration by the Council, the SSC was asked to review the ABC for this stock and recommend new ABCs consistent with the assessment and the fishing mortality that is consistent with the rebuilding strategies under consideration.

The 2010 TRAC assessment has a retrospective inconsistency in which recent estimates of stock size were revised downward approximately 40% when the analysis was updated with new data. Despite considerable uncertainties in the assessment and the systematic overestimation of stock size, the SSC endorses the 2010 TRAC estimates as the basis for ABC recommendations. The accepted assessment method for Georges Bank yellowtail flounder does not adjust for retrospective inconsistency. Using the 2010 TRAC assessment and projection methods, the stock cannot rebuild to  $B_{MSY}$  by 2014 with a 75% probability of success, even if  $ABC=0$ . An ABC of 1,998 would allow rebuilding to  $B_{MSY}$  by 2016 with 50% probability. Probability of successful rebuilding by 2016 is expected to increase to 60% if ABC is 1,486 mt and to 75% if ABC is 590 mt.

The inconsistency in estimates of recent stock size primarily results from over-estimating the abundance of the 2005 yearclass. The catches associated with rebuilding options have low probability of overfishing, even if recent overestimation of abundance continues. However, the expected rebuilding under these catch options may not be realized if overestimation continues. Similarly, if future recruitment is less than that assumed in the projections, then the expected rebuilding will not be realized. Estimates of recruitment for the last 30 years have been less than the median recruitment assumed in projections and the  $B_{MSY}$  estimate. Although there are uncertainties in the stock assessment and stock projections, the SSC concludes that these are insufficient to modify catch advice based on rebuilding scenarios. Although recent retrospective inconsistency is substantial, it may not continue if it was indeed associated with the 2005 year class. Concerns about recent recruitment affect both the short-term projections and the rebuilding target ( $B_{MSY}$ ), so alternative assumptions of future recruitment would require re-estimation of  $B_{MSY}$ . Therefore the SSC recommends consideration of a revised estimate of  $B_{MSY}$  at the next benchmark assessment that accounts for lower recruitment in the last 30 years.

The Transboundary Management Guidance Committee (TMGC) concluded that the most appropriate Total Allowable Catch for the combined Canadian and USA fishery for Georges Bank yellowtail for the 2011 fishing year is 1,900 mt. This catch is expected to allow rebuilding in the short-term (10% increase in 2011), and result in a low risk of overfishing, even if the retrospective inconsistency persists.

**3. The SSC recommends that Acceptable Biological Catch for Georges Bank yellowtail in 2011 depends on the Council's desired rebuilding objectives:**

- a. The current rebuilding strategy (rebuild by 2014 with a 75% probability of) requires that  $ABC=0$  mt;**
  - b. rebuilding by 2016 with a 50% probability of success requires that  $ABC=1,998$  mt;**
  - c. rebuilding by 2016 with a 60% probability of success requires that  $ABC=1,486$  mt;**
- and**



- d. rebuilding by 2016 with a 75% probability of success requires that  $ABC=590\text{mt}$ .**
- e. The rebuilding target,  $B_{MSY}$ , should be reconsidered by the next benchmark assessment to account for lower recruitment in the last 30 years.**

#### Index-Based Stocks

Ocean pout and the two windowpane flounder stocks are assessed using a trawl survey index. In 2009, the SSC recommended ABCs for 2010 to 2012 fishing years based on 75% of the  $F_{MSY}$  proxy applied to the most recent three-year average estimate of stock size and agreed to review these ABCs as new survey information became available. Updated surveys indicate approximately a 5% reduction in ocean pout and greater reductions for windowpane stocks. However, updated survey data are from the new Bigelow survey system, and conversions between the Albatross survey and the Bigelow survey are considered to be preliminary. More extensive evaluation of other flatfish species (e.g., Georges Bank yellowtail flounder) indicate that survey conversion factors should vary by fish length. Therefore the SSC does not recommend revising ABCs for index-based groundfish stocks.

- 4. The SSC recommendations that Acceptable Biological Catch for index-based groundfish stocks should not be revised.**

