



New England Fishery Management Council

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TO: Paul J. Howard, Executive Director
FROM: Science and Statistical Committee
DATE: April 26, 2011

SUBJECT: Calibration Methods for Setting ABCs for the Northeast Skate Complex

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

1. Approve a FSV Bigelow calibration method to be used to set Skate ABC specifications and to determine stock status.
2. Approve calibration of FSV Bigelow catches to FSV Albatross equivalents, rather than the reverse which would make it easier to directly apply future survey data.
3. Approve the use of a consistent set of FSV Bigelow strata to adjust biological reference points and adjust the catch/biomass medians as a basis for setting ABC.

On April 12, 2011 the SSC reviewed the following information and presentations developed by the Skate Plan Development Team (PDT) and others:

1. An Evaluation of Calibration Options – Skate PDT report
2. Model 2 and Model 3 length based calibration analyses – March 16, 2011
3. A hierarchical model for relative catch efficiency from gear selectivity and calibration studies, submitted manuscript by Timothy Miller.
4. Estimation of (aggregate) calibration factors – Miller et al. 2010
5. Vessel calibration review – Consensus report – August 2009
6. 2009 vessel calibration peer review document – August 2009
7. Skate rebuilding catch limit re-analysis - January 2009
8. SSC ABC and overfishing definition update approval – September 2009
9. SSC Review of Skate Acceptable Biological Catch (ABC) - April 2010
10. Abundance estimates of skates using a video survey - MacDonald et al 2010
11. Skate distribution and abundance on Georges Bank and the Mid-Atlantic Bight – Thesis by SMAST student Alyssa MacDonald
12. NEAMAP Trawl Manual

Term of Reference 1 “Approve a FSV Bigelow calibration method to be used to set Skate ABC specifications and to determine stock status.”

The SSC recommends that model 1 be used to estimate calibration coefficients and set the skate ABC specifications and to determine stock status for 2012 and 2013. This is based on the following:

1. Model 1 treats the individual species separately and is well suited for winter and little skates which drive the fishery and were well represented in calibration experiments.

2. When comparing the advantages and disadvantages of the 3 candidate models as shown in Table 7 of the PDT report, Model 1 displayed two distinct advantages:
 - It is species specific and accounts for species specific behavior
 - It is easier to apply than more complicated models
3. The estimates of the 2009 and 2010 ABC shown in Table 29 of the PDT report are similar for all three models and thus robust to model choice.

The SSC requests that the PDT provide the following information for the June 2011 SSC meeting to help evaluate the performance of model 1 with respect to changes in size distribution that might have occurred since the calibration experiment and with respect to the possible influence of size selectivity on the calibration uncertainty:

- Length frequency data for little and winter skates from the Bigelow surveys from 2008 to the latest year available.
- Length frequency data for little and winter skates from the 2008 Albatross survey

The SSC recommends that the PDT conduct additional work to evaluate the performance of the alternative calibration models. Such work might include:

- Investigation of the various factors that might influence the calibration models for the various species of skates, such as species, area, length, day-night differences, etc.
- Determine the drivers of long term change in size composition (e.g., changes in relative species composition, changes in the size composition within a species, or some combination of factors).

Term of Reference 2 “Approve calibration of FSV Bigelow catches to FSV Albatross equivalents, rather than the reverse which would make it easier to directly apply future survey data.”

The SSC approves calibration of FSV Bigelow catches to FSV Albatross equivalents for use in ABC determination. The SSC discussed the advantages and disadvantages of FSV Bigelow catches to FSV Albatross equivalents and concluded that while it is very appealing to use Bigelow catches directly, it will require an adjustment to reference points through the conversion of Albatross time series to Bigelow scale. Such conversion will introduce additional error arising from uncertainty in the calibration coefficients, particularly if the conversion is applied to individual lengths as required for calibration Models 2 and 3. In addition, there is a problem of converting zero values observed in Albatross time series to an FSV Bigelow equivalent because there are observations where the FSV Bigelow would catch skates where the FSV Albatross did not.

The SSC also notes that additional error introduced during calibration may affect both reference points (overfished and overfishing definitions). It is important to determine whether additional variance component is substantial enough to affect the overfishing reference point. The current overfishing BRP is designed to distinguish the signal (true decline in abundance) from the noise, but the conversion adds new noise that the filter could mistake as signal (this problem applies to conversion in both directions), and it is unclear if there is directionality in that problem (i.e., more likely to falsely detect overfishing, or more likely to miss overfishing?).

The SSC also recommends that any consideration of changes in skate management in the future should also involve consideration of the calibration procedure.

Term of Reference 3 “Approve the use of a consistent set of FSV Bigelow strata to adjust biological reference points and adjust the catch/biomass medians as a basis for setting ABC.”

The SSC approves the use of a consistent set of FSV Bigelow strata to adjust biological reference points and adjust the catch/biomass medians as a basis for setting ABC. The transition to use of the FSV Henry B. Bigelow in NEFSC bottom trawl surveys since 2009 and other considerations has required modifications to the areal coverage of the survey. Operating characteristics of the Bigelow related to vessel draft have prevented full coverage of shallow water strata. In addition, certain areas in Canadian waters are not consistently covered by NEFSC, specifically in the German Bank region. For these reasons, the SSC was asked to provide recommendations concerning the choice of survey strata to adjust biological reference points and for setting ABCs.

The SSC agreed that reconstruction of the entire time series to conform to current sampling practices is necessary to provide a consistent view of time series trends.

It was further recommended that evaluation of using both spring and fall survey series for status determination and for setting specifications should be explored.

It was noted that the loss of information as a result of having to discard data in the pre-Bigelow survey period is unavoidable when using the index-based approach in order to ensure consistency. However, if the skate assessments evolve to use an analytical modeling approach, it will be possible to retain the information from the areas that were dropped from the Bigelow survey as a separate index and integrated with other survey index values.