New England Fishery Management Council

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

MEMORANDUM

DATE: April 16, 2011

TO: Groundfish Oversight Committee

FROM: Augmented Groundfish Plan Development Team (APDT)

SUBJECT: **Groundfish ABCs, 2012 – 2014**

1. The APDT held a conference call to begin planning for setting 2012-2014 groundfish ABCs and ACLs. Participating in the call were Tom Nies, Anne Hawkins, and Jess Melgey (NEFMC), Tom Warren, Doug Christel, and Sara Heil (NMFS NERO), Steve Correia (Mass DMF/SSC), Steve Cadrin (SMAST Dartmouth/SSC), Chris Legault (NMFS NEFSC/SSC), Liz Brooks, Mike Palmer, and Paul Nitschke (NMFS NEFSC), and Sally Roman (SMAST Dartmouth).

2. The APDT developed additional details for the ABC-setting process approved by the Executive Committee. For stocks with an analytic assessment, the ABCs will be based on projections from the most recent assessment. Survey information will be examined to determine if stock size trends differ from the projection results. During this call the PDT focused on identifying data needs, investigating whether projections are consistent with assessment results, investigating whether survey trends are consistent with assessment results, and timing. The two attached documents provide additional details but the discussions are briefly summarized below. The overall plan is in attachment (1).

Data

3. Needed catch and survey data were identified. NEFSC personnel will coordinate obtaining the catch and NMFS survey data; Steve Correia will obtain the Massachusetts survey data. Most catch data is not expected to be available until late May, as some state catches have not yet been provided for inclusion in the area allocation tables. In addition, the group agreed to wait until the end of May when updated recreational harvest data are expected to be released.

4. With respect to discard estimation, the group agreed to use observations from the NEFO and ASM program to determine discard to kept ratios. This decision was based on NEFSC advice

that only minor differences have been noted between the two data sources. The strata used will be the ones used in the most recent assessment. This means that discards will be based on fishing mode strata, and will not be calculated down to the individual sector level as is done for monitoring sector ACE.

5. With respect to calibration of the R/V Bigelow surveys, the APDT agreed to use peer-reviewed calibrations. For cod, haddock, and yellowtail flounder, length-based calibration factors for numbers per tow are available, but length-based calibrations for biomass per tow are not. For all other species, the constant calibrations developed during the survey calibration review will be used. Two additional points were discussed:

> a. The SSC is scheduled to review several length-based calibration approaches for skates. The APDT discussed briefly whether the results of this meeting might prove informative for developing similar calibrations for groundfish stocks. Most members in the group do not expect the skate results will be informative but the SSC report will be considered when it is released.

> b. Diagnostics from the constant calibration meeting will be provided as an indication of the reliability of the constant calibration factors.

Projections

6. The APDT discussed a proposal to test the performance of projections against the GARM III assessments. Additional details of the analyses are provided in enclosure (2). The APDT agreed that this would be a useful step. One issue is timing. Because of other commitments, NEFSC personnel will be unable to complete these analyses until after June.

Survey/Biomass Relationship

7. The APDT agreed to compare survey biomass to assessment biomass using a linear regression approach. There were several technical issues to address. A similar analysis for SAW-21 developed a survey index for mature fish and compared that to SSB for GB and GOM cod. The APDT decided to use to the total biomass index rather than develop an index for mature biomass. The group also noted the timing of the surveys differs from the time of the biomass estimates from the assessments and discussed adjusting biomass for the survey time. The decision was made not to adjust based on the belief that given the variability in the survey it was unlikely to improve model fit. Dr. Cadrin agreed to arrange for this work to be completed.

Future Plans

8. The APDT agreed that further development of the criteria to use to determine if the survey trends differ from projected biomass should be delayed until the survey/biomass relationship and projection reliability were determined. Members agreed to brief the SSC at the June SSC

meeting on the planned course of action. Another conference call was tentatively planned for early May.

Draft Multispecies ABC Process Worklist/Timeline
2011

Stocks Requiring ABCs

Age-based Assessments
GB Cod (VPA)
GB Haddock (VPA)
GOM Haddock (VPA)
CC/GOM Yellowtail Flounder (VPA)
SNE/MA Yellowtail Flounder (VPA)
Witch Flounder (VPA)
Plaice (VPA)
White Hake (SCAA – Butterworth)
Redfish (ASAP)
GOM Cod (to be assessed December 2011; uncertain if we can wait
for this assessment) (VPA)
GOM Winter Flounder (to be assessed June 2011)
GB Winter Flounder (to be assessed June 2011)
SNE/MA Winter Flounder (to be assessed June 2011)
GB Yellowtail Flounder (to be assessed June 2011)

Index- or Other Assessments
GOM/GB Windowpane Flounder (AIM)
Ocean Pout (Index)
SNE/MA Windowpane Flounder (AIM)
Atlantic Wolffish (SCALE)
Atlantic Halibut (SRA)

(No update needed for pollock)

Tentative Timeline

April – May: Steps 1 through 4 (see next page below)
June 1:   Mail documents to SSC for June 15 meeting to review process
July – mid-August: Assuming SSC approval of method, steps 2 through 3
Late August/early September: Date TBD for SSC meeting to approve ABCs

Draft Process Steps

1. Data Needs

      Obtain Catch Data
          Landings
          Discards (how will discards be estimated for 2010: fishery or sector specific?)
          Recreational Harvest
          Canadian catch where appropriate

      Obtain Survey Data
          NMFS Spring and Fall
          Mass DMF spring and fall

      Obtain GARM II Projection Input Files

      Obtain GARM III Projection Input Files

      Obtain .rdat files from VPA model runs

      Obtain ASAP input file for redfish

      Expected: June 2011

2. Do projections match assessment results?
      Using GARM III assessments, perform projections from earlier starting points (retrospective peels) and evaluate performance of these projections relative to the GARM III assessment results
      Determine if possible causes for divergence between projection and assessment and propose approaches to reduce biases if possible

Expected completion: July 2011

3. Can surveys reliably detect when stock growth differs from projected stock growth?

      Regress GARM III biomass to surveys
      Compare stock size trends projected from GARM II to surveys from 2005-2007 and GARM III actual stock size
      Determine whether to use survey numbers or weights (or both)
      Develop metric to use to evaluate if survey trend differs from projected stock size
      Establish criteria that determine if an adjustment is necessary: when do we throw the "red flag"?

Expected completion: June /July 2011

4. Develop approach to use when survey suggests stock growth differs from the projection

     Test approach using GARM II data?

Expected completion: July 2011

Future Issues For PDT

5. Reconsider management uncertainty adjustments (i.e. difference between ABC and ACL) based on first year of A16

Enclosure (2)
**Proposed method to evaluate projection methodology
and proposed projection adjustment**

Before moving forward with comparing GARM-III projections with recent survey observations, we might first consider evaluating past performance as follows. The advantages of doing this on years preceding GARM-III are that we "know" what the VPA estimated through 2008, and the data do not have any HB Bigelow observations (one less source of uncertainty). If the projections perform poorly on data in this era, we should investigate whether we can trace the main source of misspecification between projected values and VPA-estimates. If we are unable to identify reasons for poor projection performance, then is there any value in attempting this on projections made from the GARM-III models?

Example algorithm for evaluating historic performance of projections:

1. Take GARM-III model input file
2. Perform bootstrapped retrospective run with X-year peel
3. For each year of the retrospective VPA, use current projection methods and compare to realized VPA results
4. Example:
    a. VPA input file has data through 2008
    b. Perform retro-bootstrap back to 2000
    c. Take each bootstrapped VPA Retro file for Y=2000 and project forward to Y=2008 from each of the N(t+1) bootstraps; repeat process using VPA Retro file for Y=2001, Y=2002, …, Y=2007 with projections to Y=2008 in all cases
        i. Assume catch and SSB weights, selectivity, and maturity at age vectors are equal to *recent*[*] 5 year average ([*]*recent*=relative to the year of each VPA Retro file)
        ii. There are 2 cases to deal with for stocks that have retrospective patterns
            1. Stocks that used the split series for GARM-III will continue with the split series formulation for each of the VPA peels
            2. Stocks that used a retrospective adjustment instead of the split-series (Redfish and American plaice) will need to perform the retrospective analysis again for the VPA model at Y=2000 (peeling back 7 years) to estimate the ρ adjustment factor for NAA(t+1); this will be repeated for each of the VPA Retro files
        iii. Sample from observed recruitments according to stock-specific GARM-III model choice (entire cdf or 2-stanza cdf seem to be most common)
        iv. Project from each NAA(t+1) by removing known total Catch (mt) in projection years, allowing AGEPRO to solve for the realized F
    d. Evaluate projection performance
        i. Compare F estimate from AGEPRO with 'realized' F from VPA output in each projection year
        ii. Evaluate how well the assumed projection inputs matched realized vectors for weight, maturity, selectivity at age
        iii. Evaluate how well projected recruitment matched VPA estimated recruitment

iv. Evaluate how well initial population abundance (or SSB) matched the GARM III estimates for that year.

Step 2: To be determined, based on evaluation of historic projection performance