UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northeast Fisheries Science Center
166 Water Street
Woods Hole, MA 02543-1026

27 December 2010

Paul Howard
Chairman, New England Fishery Management Council
50 Water Street
Newburyport, MA 01950

Dear Paul,
In your 15 December 2010 letter, you requested that NOAA Fisheries consider four options for providing biennial assessment advice to the NEFMC for groundfish stocks:

1. Project forward from the last assessment based on mortality targets without updating any data other than landings and discards.
2. Project forward from the last assessment using actual catch in recent years (e.g. 2008 – 2010). Update survey indices and qualitatively evaluate survey trends to see if there are any obvious red flags raised. No changes to projection methodology would be made: as an example, if GARM III used a Rho adjustment, use the same one this time.
3. Project forward from the last assessment using actual catch in recent years. Somehow input a recruitment estimate into the projection for recent years (I don't know if this is possible). Update survey indices and qualitatively evaluate survey trends to see if there are any obvious red flags raised. There may be other technical refinements that could be used here.
4. Update the most recent approved assessment model with recent catch and survey indices. Do not revise ALKs, selectivity, etc.

Center staff evaluated the four options and provide the attached summary of the advantages and disadvantages of each. In summary, Option 2 is the alternative we propose to pursue. Option 1 is doable but provides less information. Options 3 or 4 cannot be exercised if the Center is to fulfill its existing commitments for FY11 assessment advice to the NEFMC, MAFMC, and TRAC.

I plan to attend the Executive Committee on 4 January to present these findings.

Sincerely,

Nancy B. Thompson, Ph.D.
Science and Research Director

cc: P. Kurkul F. Serchuk R. Merrick
J. Weinberg P. Rago T.Nies (NEFMC)

Summary of Costs and Benefits of Four Assessment Alternatives for 2012-14 Multispecies Groundfish

Option	Advantage	Disadvantage	Consequences
1--Project forward from the last assessment based on mortality targets without updating any data other than landings and discards by stock.	--Only requires update of landings and discards for 2010. --Builds on analyses prepared previously by PDT and delivered to the SSC.	--Based entirely on assumptions from GARM III. --Model results are dependent on assumed recruitment and the stock recruitment model defined in the GARM. For some stocks the projection results are dominated by assumed recruitment. No new information on recruitment patterns since 2007. --Unlikely to be accepted by SSC	--No major externalities for other assessment activities. --Will create demand for a more thorough report
2--Project forward from the last assessment using actual catch in recent years (e.g. 2008 – 2010). Update survey indices and qualitatively evaluate survey trends to see if there are any obvious red flags raised. No changes to projection methodology would be made: as an example, if GARM III used a Rho adjustment, use the same one this time.	--Incorporates effects of realizes catches on expected population size for 2011 status. --Compares model predictions with fishery independent measures of total stock size.	--Requires development of methods to compare model predictions with survey abundances. --Does not incorporate information related to recruitment --Model results are dependent on assumed recruitment and the stock recruitment model defined in the GARM. For some stocks the projection results are dominated by assumed recruitment. No new information on recruitment patterns since 2007. --Projections depend on persistence of catchability and selectivity patterns from GARM	--Staff time necessary to update landings, discards and surveys.
3--Project forward from the last assessment using actual catch in recent years. Somehow input a recruitment estimate into the projection for recent years Update survey indices and qualitatively evaluate survey trends to see if there are any obvious red flags raised. Other technical refinements as appropriate..	--Incorporates effects of realizes catches on expected population size for 2011 status. --Compares model predictions with fishery independent measures of total stock size AND recruitment. Does not require changes to ALK	--All of those listed for Option #2. --Mechanisms to identify recruitment include use of historical ALK and/or cohort slicing. These may be problematic if growth rates change rapidly. --Extracting the indices by age begs the question of why wasn't a new assessment updated since all the data are available.	--Staff time necessary to update landings, discards and surveys. --Staff time to estimate survey age or stage specific indices of recruitment and to determine methods for statistical comparisons **--Unable to provide at least some previously committed assessment advice**
4--Update the most recent approved assessment model with recent catch and survey indices. Do not revise ALKs, selectivity, etc.	--Would incorporate as much recent information as possible. --Would not require updates to ALK --Relies on peer-reviewed stock assessment model; does not require new methods to interpret indices.	--Major costs in terms of staff time. --Results may be unacceptable if major changes in stock status occur or if retrospective patterns change. --Difficult to restrict potential changes in model formulation.	--Drop SARC 52. --Drop TRAC. --Drop or reduce # of updates for MAFMC

More detailed notes on Alternative Approaches follows:

1) ***Project forward from the last assessment based on mortality targets without updating any data other than landings and discards***
   a) Key assumptions
      i) No changes in underlying parameters from GARM including growth, partial recruitment etc
      ii) Initial conditions from GARM are appropriate
      iii) No changes in discard patterns and potential sources of bias.
      iv) All fishing mortality targets were met
      v) Increases in F are directly proportional to increases in total catch.
   b) Advantages
      i) Relatively straightforward to accomplish
      ii) Creates a predicted sampling distribution of fishing mortality rates based on
      iii) No changes to existing schedule for SARC, TRAC or Mid Atlantic updates
   c) Disadvantages
      i) Relies heavily on the assumption of no change in underlying parameters
      ii) Emphasizes the terminal year estimate of stock size and validity of it's sampling distribution.
      iii) Results are highly dependent on assumed recruitment.
      iv) Unlikely to be accepted by SSC since it is built primarily on assumptions.
   d) Requirements
      i) Review of previous predictions of stock size and landings under target fishing mortality rates.
      ii) Timely update of landings information for 2010, including state data so that proration can be completed.

2) ***Project forward from the last assessment using actual catch in recent years (e.g. 2008 – 2010). Update survey indices and qualitatively evaluate survey trends to see if there are any obvious red flags raised. No changes to projection methodology would be made: as an example, if GARM III used a Rho adjustment, use the same one this time.***
   a) Key Assumptions
      i) Assumes that increases in total weight of catch produce proportional changes in F
      ii) Requires update of landings and discards for 2010. Timing of this depends on completion of audits for landings, receipt of state landings data, application of Area Allocation (AA) procedures to total year.
      iii) No changes in underlying parameters from GARM including growth, partial recruitment etc
      iv) Initial conditions from GARM are appropriate
   b) Advantages
      i) Incorporates realized catches to inform projection and to update distribution of stock sizes accordingly
      ii) Minimal effects on SARC, TRAC and Updates.

c) Disadvantages
   i) Relies heavily on the assumption of no change in underlying parameters
   ii) Does not incorporate any new information on recruitment; therefore implies that average recruitment has been achieved. Results are highly dependent on assumed recruitment.
   iii) Emphasizes the terminal year estimate of stock size and it's sampling distribution.
   iv) Assumes that retrospective pattern evident in 2008 has not changed
   v) Qualitative comparison of model predictions with survey trends may not be easy to develop and could be perceived as arbitrary, particularly when conflicting trends are observed.

d) Requirements
   i) Update of landings and discards for 2010. Timing of this depends on completion of audits for landings, receipt of state landings data, application of Area Allocation (AA) procedures to total year.
   ii) Updates of Surveys in terms of numbers and weights
   iii) Application of survey calibration coefficients
   iv) AGEPRO updates with new catch data
   v) Develop appropriate scalar adjustments of survey indices to allow comparisons with aggregated model predictions of stock abundance. Example—compare survey biomass to predicted biomass from projection model.

3) ***Project forward from the last assessment using actual catch in recent years. Somehow input a recruitment estimate into the projection for recent years (I don't know if this is possible). Update survey indices and qualitatively evaluate survey trends to see if there are any obvious red flags raised. There may be other technical refinements that could be used here.***

a) Key Assumptions
   i) Assumes that increases in total weight of catch produce proportional changes in F
   ii) Requires update of landings and discards for 2010. Timing of this depends on completion of audits for landings, receipt of state landings data, application of Area Allocation (AA) procedures to total year.
   iii) No changes in underlying parameters from GARM including growth, partial recruitment etc
   iv) Initial conditions from GARM are appropriate
   v) Use one of two methods to estimate recruitment from survey indices
      (1) Assume that all observations below a cutoff length are recruits
      (2) Apply previous Age Length Key to current estimate of size frequency

b) Advantages
   i) Incorporates realized catches to inform projection and to update distribution of stock sizes accordingly
   ii) Attempts to improve forecast by illustrating effects of recruitment deviations

c) Disadvantages
   i) Relies heavily on the assumption of no change in underlying parameters

ii) Does not incorporate any new information on recruitment; therefore implies that average recruitment has been achieved.
iii) Emphasizes the terminal year estimate of stock size and it's sampling distribution.
iv) Assumes that any retrospective pattern evident in 2008 has not changed
v) Qualitative comparison of model predictions with survey trends may not be easy to develop and could be perceived as arbitrary, particularly when conflicting trends are observed.
vi) Estimating recruitment trends in surveys may be difficult as this is often when model based estimates are most uncertain.
vii) Major changes in previously scheduled events including:
(1) Cancel SARC
(2) Reduce participation in TRAC
(3) Reduce or eliminate updates for MAFMC (fluke, scup, sea bass, bluefish, dogfish)

d) Requirements
i) Update of landings and discards for 2010. Timing of this depends on completion of audits for landings, receipt of state landings data, application of Area Allocation (AA) procedures to total year.
ii) Updates of Surveys in terms of numbers and weights
iii) Application of survey calibration coefficients
iv) AGEPRO updates with new catch data
v) Develop appropriate scalar adjustments of survey indices to allow comparisons with aggregated model predictions of stock abundance. Example—compare survey biomass to predicted biomass from projection model.
vi) Recruitment Estimates
(1) Develop estimates of recruitment from survey data
(2) Compare recruitment estimates with recruitments predicted by model or with previous survey-based values.
(3) Agree on a methodology to compare with model based estimates

4) ***Update the most recent approved assessment model with recent catch and survey indices. Do not revise ALKs, selectivity, etc.***

a) Key Assumptions
i) No changes in underlying parameters from GARM including growth, partial recruitment etc
ii) Initial conditions from GARM are appropriate
iii) Historical or average ALK are appropriate for deriving landings and discards at age, and age-specific survey indices.

b) Advantages
i) Uses models to improve understanding of surveys and catches
ii) Does not require the development of new procedures to compare model predictions with observed trends
iii) Does not require updates to all age-length data

c) Disadvantages

i) No change in model formulations may preclude ability to better understand dynamics
ii) Implications of using ALKs have not been investigated for all stocks.
iii) If retrospective patterns are not investigated, then adjustment factors from 2008 would be criticized
iv) Would likely need a large peer review
v) Major writing requirements could delay timeliness.
vi) If adverse findings then the most likely recommendation would be a full benchmark. Criticism would be that shortcuts were inappropriate and need full review.
vii) No SARC 52
viii) No TRAC
ix) No Mid Atlantic Updates

d) Requirements
i) Update of landings and discards for 2010. Timing of this depends on completion of audits for landings, receipt of state landings data, application of Area Allocation (AA) procedures to total year.
ii) Agree on appropriate age-length key or function of historical ALKs to derive age based estimates of landings, discards, and survey indices.
iii) Update landings, discards and survey estimates at age for all stocks from 2008 to 2010
iv) Investigate retrospective patterns and recomputed adjustment factors.
v) Major writing requirements
vi) Peer review panel in addition to SSC.

5) ***Option 4 plus use recent ALKs for some stocks. This would involve a bit of triage with a focus on the most important stocks, notably GOM cod.***
a) Key Assumptions
b) Advantages
i) Greater scientific credibility for process
c) Disadvantages
i) No SARC 52
ii) No TRAC
iii) No Mid Atlantic Updates
iv) If adverse findings then the most likely recommendation would be a full benchmark.
d) Requirements
i) All as in option 4 plus many others