

SCIENTIFIC AND STATISTICAL COMMITTEE REPORT ON  
GROUND FISH STOCK ASSESSMENT REVIEW PROCESS FOR 2005 THROUGH 2006

Dr. Elizabeth Clarke (National Marine Fisheries Service) presented an overview of issues related to the stock assessment review process for 2005 and 2006. After discussion of the key issues, it was agreed that:

1. Dr. Clarke will prepare a draft list of stocks to be assessed in the next stock assessment cycle prior to the September 2003 Scientific and Statistical Committee (SSC) meeting. For each stock, candidate assessment authors will be identified, and a determination will be made whether a full assessment or expedited assessment is appropriate.
2. The SSC will update its "Terms of Reference for Groundfish Rebuilding Analysis" to include all output needed by the Groundfish Management Team (GMT) as well as to reflect variables of interest from the rebuilding analysis software.
3. The SSC will continue to review rebuilding analyses. In a normal three-Council-meeting process, these reviews should be completed earlier than that experienced in this year's two-meeting process.
4. The Northwest Fisheries Science Center (NWFSC) will prepare an outline for an electronic assessment archive, including elements for all input data, output data, intermediate results, diagnostics, and full document in PDF format.
5. The SSC will schedule a methods workshop in 2004 and other "off" years (with logistical support from NWFSC) to address methodology issues common to multiple stock assessments, e.g. methods to derive indices of abundance from recreational catch-effort data; spatially explicit models for stock assessment; dealing with conflicting indices of abundance; etc.
6. The SSC will provide modifications to the stock assessment review (STAR) Terms of Reference needed to incorporate all of the points outlined in the following sections of this statement.

**GENERAL SSC COMMENTS ON THE STAR PROCESS**

SSC members participated in all of the Council's STAR Panels this year. Namely, the traditional STAR Panels for Pacific ocean perch (POP) and widow rockfish (STAR 1) and for bocaccio and black rockfish (STAR 2); and the new expedited review process for cowcod, darkblotched, and yellowtail rockfish (STAR-lite). Based on this experience, as well as feedback from other reviewers and Stock Assessment Team (STAT) members, the SSC compiled two lists of comments and recommendations for the STAR process in future years – one list for the traditional STAR process, and a separate list for the newly created STAR-lite process.

**Traditional STAR Process**

Although the Council's STAR process has been in place for more than five years, it has been an evolving process with year-to-year modifications based on the experience and "lessons learned" from earlier years.

While the process is generally working well and has reached a mature level, continued fine tuning will be necessary to meet the challenge of providing thorough review of increasingly complex stock assessments.

Recent stock assessment research has focused on more fully incorporating uncertainty into management-related model outputs. This is important work that has been encouraged by the SSC. The resulting methodology (e.g., as used in the POP assessment) is considerably more complex than methods generally used presently. The large number of parameters estimated coupled with a variety of priors, penalty functions, and constraints tax the ability of reviewers to fully understand the nuances of model behavior using only the traditional tables and figures provided in stock assessment documents. Further, the use of numerically intensive Monte Carlo Markov Chain (MCMC) analysis for estimation of posterior distributions (used for quantifying uncertainty and central tendency) further exacerbates the problem. While the SSC encourages this type of "cutting edge" modelling, there is concomitant responsibility for assessment authors to provide a broader suite of intermediate results and model diagnostics in addition to those provided when less complex models are used for assessment. Because the volume of these data can be quite large, providing them in electronic form is more practical than via traditional hard copy, e.g., creating a data CD to accompany and to be referenced from the assessment document. Appendix A of

the POP STAR Panel Report provides a partial list of intermediate results and diagnostics that should be provided. Assessment authors with experience using these more complex models are encouraged to augment this list.

The lack of consistency among stock assessments – reviewed by different STAR Panels – is becoming an issue. Several examples are:

1. Discards estimates based on the new observer program data were used in the bocaccio assessment, but not for any of the other assessments conducted this year.
2. The NWFSC trawl survey has been used in the assessments for POP, sablefish, thornyheads, and Dover sole, but not for other species assessed recently.
3. Catchability for logbook and whiting bycatch indices of abundance has been assumed constant over time in most assessments; but in the yellowtail assessment, catchability was allowed to vary annually.
4. Selectivity is handled in a myriad of ways in the various stock assessments, e.g., constant over time, estimated as annual vectors, varying annually with random walk, etc.

While some variation is to be expected, standardization guidelines are needed to prevent further drift from consistent application of data and concepts.

For the Council to optimize the benefits derived from the appreciable resources dedicated to the STAR process, it is critically important for assessment authors to carefully review STAR Panel reports associated with previous assessments. The recommendations from these STAR reports should be foremost in planning for new stock assessments.

The process of selecting the reviewers who will sit on a STAR Panel should strive to balance the tension between providing institutional memory regarding the species being assessed and providing new views and insights. The former is generally accomplished by selecting reviewers from within the Council family, while the latter is handled via outside reviewers, such as those provided by the Center for Independent Experts (CIE). With the increased complexity of groundfish assessments (discussed above), another important consideration to ensure each panel has one or more members well versed in the use of these "cutting edge" models. The STAR Panel member selection process would benefit from SSC review of the composition of each panel before the (bi)annual assessment cycle begins.

Reports of the CIE reviewers regarding the pros and cons of the STAR process should be provided, at least to the SSC. These outside views of our process are critical in the Council's annual review of its STAR process.

### **STAR-lite Process**

The STAR-lite process differs from the traditional STAR process in two fundamental ways, (1) the review is much abbreviated, providing less than one day per stock (compared to 2.5 days per stock in the traditional process); and (2) the review is conducted by the SSC Groundfish Subcommittee rather than by an *ad-hoc* panel composed of Council-family scientists and at least one "outside reviewer." The recent STAR-lite (May 2003) worked well generally, but several steps will be needed to ensure that future STAR-lite processes are equally successful. Namely,

1. As a rule of thumb, the meeting length should be one day per stock.
2. Face-to-face meetings – not conference calls – are required to communicate stock assessment results and panel feedback within the abbreviated time period.
3. Local area network (LAN) support – including file sharing and printer access – is critical for the expedited process.
4. Documents that are distributed electronically should be in PDF format to maintain consistent pagination. Additionally, page numbers should appear on each page.

These items should be added to the Terms of Reference for the STAR-lite process. Items 3 and 4, above, should also be added to the Terms of Reference for the full STAR process.

Probably due to the newness of the STAR-lite process, STAR members are sometimes puzzled about

aspects of the previous stock assessment that can be modified while staying within the guidelines of an "updated assessment." For example, should the catch time series be updated to reflect only newly available years since the last assessment or alternatively, should the entire catch time series be updated to reflect all database revisions since the last assessment? The SSC strongly prefers the latter, and in general, the principle that updated assessments should use best available data from all sources. Additionally, all model parameters should be re-estimated in the update. However, other issues (e.g., modifying objective function weights within the same stock assessment model) fall more into a gray area. The SSC recommends that this type of change should not be routine, but should be allowable in some cases, if strong justification is provided by the STAT.

Considerable effort is required by STAT members to prepare and document the assessment updates reviewed by a STAR-lite panel. In addition, the cumulative time and effort of the reviewers (SSC Groundfish Subcommittee plus GMT and GAP representatives) is substantial. In some cases – such as this year's yellowtail assessment – a large proportion of the resources that would be required to conduct a full assessment was dedicated to carrying out and reviewing the assessment update. Further, assessment updates typically will have a shorter "shelf life" than full assessments. Consequently in such cases, it may be more efficient to allow STAT members in consultation with the SSC to move these assessment updates to the full assessment status.

Finally, while the STAR-lite process worked well this year, it should be fully recognized that many issues which would have been explored in a full assessment were not possible to explore within the STAR-lite. These issues were tabled for the next full assessment.

PFMC  
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