



NOAA FISHERIES

Northwest Fisheries Science Center

Stock Assessment Science Program Review

Northwest Fisheries Science Center Summary and Response – October 2014

Introduction

On June 10-13, 2014, the Northwest Fisheries Science Center (NWFSC) hosted a panel of experts to conduct a programmatic review of the stock assessment science conducted under the auspices of the Magnuson-Stevens Act.

This review was the second in a series of annual reviews, conducted on a different theme each year over a five-year cycle, designed to maximize the transparency and effectiveness of major science programs located at the six Science Centers as well as those located in or coordinated through NOAA Fisheries' Office of Science and Technology. Fishery stock assessment science is a major endeavor for NOAA Fisheries and the science supporting it is extensive. Therefore, the review of the process was split between 2013's focus of data collection and management and 2014's focus on the modeling approaches, review processes, and responsiveness to Magnuson-Stevens Act mandates.

This was not a review of any particular stock assessment but rather a review of the overall program, centered on the following seven themes from Terms of Reference agreed on by the NOAA Fisheries Science Board:

- 1) Does the NWFSC apply a suitable scientific/technical approach to fishery stock assessment modeling?
- 2) Is the assessment process efficient, effective and clearly described, including terms of reference for assessment reports?
- 3) Does the NWFSC, in conjunction with other entities such as the Pacific Fishery Management Council's (PFMC) Scientific and Statistical Committee (SSC), have an adequate peer review process?
- 4) Is the NWFSC's program organization effective at accomplishing needed assessments according to a set of assessment priorities?
- 5) Does the NWFSC achieve adequate assessment accomplishments relative to mandates particularly with respect to the number of Fishery Management Plan (FMP) species assessed?
- 6) Does the assessment program adequately communicate their results, needs, and research?
- 7) Are there opportunities for improving stock assessments and the stock assessment process?

To conduct the review, we selected experts in the topic area who were not associated with the NWFSC. The panel was provided with presentations covering the state of NWFSC's stock assessment program. Panelists were also provided with background material for more in-depth information and had time to discuss the state of the NWFSC's stock assessment program, and its utility, with NWFSC management and staff during the review. The panelists also considered comments and responses to questions from the public participants who attended the review.

More information regarding the NWFSC review may be found at:

http://www.nwfsc.noaa.gov/news/events/program_reviews/2014/index.cfm.

The results from this year's review, along with those being conducted at each of the other five fishery science centers and the Office of Science and Technology, will be used to prepare a national summary, to highlight best practices and to inform decisions on opportunities for improving stock assessment

science programs across NOAA Fisheries. The full suite of these reports will be found at: <http://www.st.nmfs.noaa.gov/science-program-review/>

Acknowledgements

We would like to thank the review panelists who devoted a significant amount of time to prepare for, and participate, in this review. Their observations and recommendations provide valuable feedback on how our stock assessment program is performing relative to our stated goals and objectives. We also greatly appreciate the time and thought that participating stakeholders put into this review; their questions and comments sparked many conversations and their perspective was invaluable particularly when addressing the issues of priority setting and communications.

The panelists for this review were:

- Richard Ferrero (Chair), U.S. Geological Survey
- Louis Botsford, University of California, Davis
- Andrew Cooper, Simon Fraser University
- James Ianelli, NOAA Fisheries, Alaska Fisheries Science Center
- Genevieve Nesslage, Atlantic States Marine Fisheries Commission
- Ian Stewart, International Pacific Halibut Commission

Finally, we would like to express our appreciation to the NWFSC staff for their contributions, insights, and candor during this weeklong review. Overall, the reviewers provided overwhelmingly positive comments on the NWFSC's stock assessment program, and particularly on its cutting-edge work on assessment development. We anticipate that the results of this review will encourage and motivate staff and leadership to continue their excellent work and to improve key aspects of assessment science.

Response to Recommendations and Other Observations

The panelists' reports applauded the NWFSC's internationally and nationally recognized assessment work. They also highlighted the challenges the division has in maintaining this program with constrained resources. In addition, the panel provided many valuable recommendations.

Here, we provide our response to the substantive points identified in the summary report. A number of additional issues were included within the individual reports, and although these are not addressed here, they will be taken into consideration as we respond to the recommendations that encompass these other issues.

- ❖ *Increasing transparency and formality in our stock assessment prioritization protocols will help improve our ability to meet national and regional goals, as well support better planning.*
 - The NWFSC will continue to participate in the national effort for stock assessment prioritization. This effort is ongoing and the NWFSC is assisting in the testing of the proposed approach. We will continue to work with the senior scientist for stock assessments to complete this prioritization in a timely manner. Several panel members noted that national priorities may not align well with regional priorities; our strong involvement in this process will help ensure that West Coast ground fish issues are considered.
 - The NWFSC, with collaboration from the Southwest Fisheries Science Center (SWFSC), will also develop by April 2015 a proposal for regional prioritization for discussion with stakeholders. This will be finalized by Nov. 2015. When finalized and implemented, it will form the basis for future discussions with the Pacific Fishery Management Council (PFMC) about ground fish stocks to be assessed in each assessment cycle.
 - We will work with NMFS headquarters, when these efforts are complete, to consider revisions to the Fish Stock Sustainability Index to align more closely with these priorities, if practical.
- ❖ *The panel noted that the late availability of trawl survey data hinders the flexibility of stock assessment scientists.*

- A Data Manager was recently hired to overhaul the data sets relevant for the West Coast ground fish fishery. Primary among these efforts is reducing the time for data processing and delivery of the trawl survey data, as well as making those data publicly accessible in a timely manner. We expect to release trawl data for subsequent analysis and reporting within 3 months of the completion of the surveys by September 2015, and to have data publicly available in fiscal year 2016.
- ❖ *The panelists noted that for nearly all West Coast Ground fish species, stock structure is not well-known. Failure to assess appropriate demographic units (defined by stock structure) can result in missed opportunities for harvest and inadvertent or naïve impacts on species of conservation concern.*
 - This is a critical issue and one that the NWFSC is uniquely poised to address. In January 2015, we will convene an internal meeting to identify the objectives, priorities and requirements for a genetic sampling plan. This information would be used to develop a resource and staffing plan to evaluate stock structure for Ground fish Fishery Management Plan species.
 - We will develop initial sampling plans by December 2015 for use by observers and fishery-independent surveys to support stock structure evaluation, as resources permit.
- ❖ *The panelists noted that the NWFSC assessment venture is constrained by resources. In particular, assessment scientist staffing is minimal for its needs, and travel restrictions challenge the group's ability to meet with stakeholders.*
 - We will develop short and long-term staffing plans, including succession planning, for the assessment group by February 2015. As several panelists suggested, this plan will consider the option of increasing staffing to support the routine update of full assessments already developed and the use of students to augment staff while providing them with valuable experience.
 - NWFSC Leadership will also evaluate travel needs for assessment years, including FY 2015, and will ensure, by December 2014 that travel cap is distributed, to the extent practical, to minimize limitations on assessment-related travel needs.
- ❖ *The stock assessment scientists were commended on their development of assessment tools and techniques, including those developed for species that are not data-rich. The panel encouraged the continuation of these developments. However, panelists expressed concern that while standardization may improve assessment processes, it may also stifle innovation. There was also concern that the apparently 'rigid' categorization of assessments might prevent alternative approaches from being pursued by restricting 'allowable' methods or the types of data that might be included.*
 - The stock assessment scientists and their collaborators are world leaders in the development of data-poor and data-moderate stock assessment techniques, as well as in developing and implementing standardized methodologies for stock assessment. We will continue to pursue this area of research and development. We will also ensure that NMFS leadership is aware of the many recommendations to make the Stock Synthesis platform open-source.
 - To ensure that innovation is fostered, the NW Center will work actively with other Centers on the development of new techniques including improving methods for estimating and reporting uncertainty. In particular, in Seattle we are in close proximity to the Alaska Fisheries Science Center (AFSC). We will work actively with the AFSC to increase interactions in the coming year.
 - Finally, the categorization of assessment types is, in part, an outgrowth of PFMC policy and review processes. In FY15, we will engage PFMC leadership in a discussion of potential alternative approaches to assessments proposed in this review.
- ❖ *The Panel noted that two components of the PFMC process appear to constrain the efficiency and throughput of assessments. The first of these is the rigorous review required for nearly all*

stock assessments under the PFMC process; the second is its reliance on a biennial process in which all assessments occur in a single year.

- The PFMC stock assessment review process is arguably the most rigorous in the country, and coordinating the week-long review panels with the relatively small number of experts in ground fish assessments does limit the throughput of assessments the agency can achieve. The biennial process was developed to provide time for the Council to work on large-scale policy efforts, such as the IFQ program. In FY15, we will engage PFMC leadership and staff in a discussion of alternative approaches to the assessment process that were raised in this review.
- ❖ *The center was encouraged to use Management Strategy Evaluations (MSEs) as an approach to identify key data needs, and to better address ecosystem issues for stock assessments.*
 - We agree that MSEs are a key approach for improving our understanding of our systems, and for identifying data areas that are most important to improve or refine. As panelists noted, we are currently engaged in an MSE for hake, which we will continue. In addition, we intend to use the 2015 assessment cycle to begin to explore options for additional species on which to conduct sensitivity analyses and MSEs.

Conclusion:

This review was the second in a series of annual reviews at the NWFSC and was focused on the Center's stock assessment program. The observations and recommendations of the panel members provided valuable feedback on how the Center's stock assessment program is performing relative to our stated goals and objectives, and how it can be improved. Overall, panel members were overwhelmingly positive in their comments. The following key recommendations were made:

- 1) The Center should develop a formal and articulated approach to assessment prioritization to aid with staff, resource and other planning as well as to ensure that fishery and conservation needs are met.
- 2) It will be important to reduce the time needed to deliver data for assessment uses.
- 3) The Center should continue to develop novel and improved approaches to stock assessment, but should also seek to make standardized tools more widely available (*i.e.*, not dependent upon a single person).
- 4) The Center will engage in strategic human resource planning for the assessment program and explore opportunities to increase available resources for ground fish assessment.
- 5) The Center should work to improve our understanding of the west coast ground fish assemblage, including stock structure and ecosystem interactions.
- 6) The Center should pursue one or more MSEs to inform some of these areas.
- 7) The Center should prioritize, when practical, opportunities for face-to-face meetings and venues that encourage increased collaborations.

NWFSC leadership agrees with these recommendations and is committed to implementing the necessary changes in existing protocols at the Center to realize significant benefits and efficiencies.

Table 1: Summary of Action Items and Schedules

| Action Item | Schedule |
|---|---|
| Contribute to national stock assessment prioritization process | Ongoing |
| Develop regional prioritization scheme for assessments | Draft: April 2015 Final: November 2015 |
| Work with HQ to adjust FSSI stocks to reflect regional needs as needed and possible | Ongoing |
| Trawl survey data delivery processes improved | September 2015 |
| Develop genetic sampling plans for west coast ground fish | Initiate effort: January 2015 Sampling plan developed: December 2015 |
| Pursue data-limited assessment methods | Ongoing |
| Engage PFMC leadership and staff on issues raised in this review | Fall 2015 |
| Begin exploration of species for sensitivity analyses and MSEs | 2015 stock assessment cycle |
| Conduct hake MSE | Ongoing |