
NATIONAL STANDARD 2 IN DETERMINING BEST SCIENTIFIC INFORMATION AVAILABLE

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SUBTHEME: Implementation of National Standard 2 in the face of uncertainty

BIO

Dr. Richard Methot serves as NOAA’s Senior Scientist for Stock Assessments. Previously during his 32-year career with NOAA Fisheries he has worked in the Southwest, Alaska, and Northwest Fisheries Science Centers and Office of Science & Technology. Throughout his career, he has focused on development and application of fishery assessment models and communication of assessment results to the fishery management process. In 2008, he was awarded the Department of Commerce Gold Medal for his development of the Stock Synthesis assessment approach. Dr. Methot has a prominent role in several national and international committees related to marine fish stock assessment and management including National Stock Assessment Workshops, National Scientific and Statistical Committee, Stock Assessment Improvement Plan and the Working Group for Revision of National Standards 1 and 2. In his new role as national Science Advisor for Stock Assessments, he strives to improve assessment methods, including bringing more ecosystem and environmental information into the assessments, and to improve communication of the role that assessments serve in supporting sustainable fisheries.

Dr. Methot's educational background includes a B.S. in Fisheries (1975) from the University of Washington; Ph.D. in Biological Oceanography from Scripps Institution of Oceanography, University of California at San Diego (1981); and a post-doctoral position at the Bodega Marine Laboratory, University of California.

ABSTRACT

National Standard 2 (NS2) of the Magnuson-Stevens Act (MSA) states that “conservation and management measures shall be based upon the best scientific information available.” New explicit requirements for peer reviews and for SSC recommendations were put in place in the 2006 reauthorization of the MSA. NMFS subsequently updated NS2 (Federal Register, July 2013, <http://www.gpo.gov/fdsys/pkg/FR-2013-07-19/pdf/2013-17422.pdf>) to provide guidance for implementing these changes. This update to the NS2 Guidelines also incorporated requirements and ideas from the Information Quality Act (June 16, 2005), the Office of Management & Budget’s Peer Review Guidelines for all federal actions, and the National Research Council’s report in 2004 on good practices for quality assurance. The NS2 Guidelines cover 4 key topics regarding quality assurance:

- Description of Best Scientific Information Available (BSIA)
- Scientific peer review standards
- Role of Science and Statistical Committees (SSCs) in the review of scientific information
- Purpose, contents, and availability of Stock Assessment and Fishery Evaluation (SAFE) reports.

Subsequent to publishing the NS2 Guidelines, NMFS initiated an effort to assure that each NMFS Science Center – Regional Fishery Management Council pair has a peer review process that follows the updated NS2 Guidelines. Peer review processes such as the SAW/SARC in the Northeast, SEDAR in the Southeast, STAR on the Pacific coast, SSCs and Plan Teams in the North Pacific, WPSAR in the Pacific Islands are already in place to provide quality assurance for stock assessments. Although these processes have the same intent as the NS2 Guidelines, there may have been some aspects that diverged from the guidance. The effort by NMFS provided an opportunity for the Science Centers and Councils to review, tweak, document and affirm that their peer review process meets the expectations of the NS2 Guidelines. A Federal Register notice will document the results.

While it is important to have in place a process to determine that the BSIA is being used, it also is necessary to document this finding adequately as federal regulations are promulgated. This involves NMFS Science Centers, NMFS Regional Offices, Councils, and Council SSCs acting in a coordinated manner to conduct assessments, review these assessments, make status determinations, make fishing level recommendations (e.g. Acceptable Biological Catch), develop management recommendations (Annual Catch Limits and associated Accountability Measures and fishery controls), affirm that the BSIA has been used in arriving at these recommendations, and document all for the public record. A description of the steps involved is under development and SSC input to this description will be sought. The capability of the NMFS Species Information System has been enhanced to store uploaded assessment documents, SSC minutes and other memos and reports needed to document the process.

Many challenges to the determination of BSIA remain. One is in data-limited situations where clear-cut scientific advice is difficult to derive from available information. While various methods involving catch time series and/or life history information have been developed, all such methods place great reliance on various proxies and information derived from expert opinion rather than measurable quantities. In such situations, it is not feasible to quantify well the degree of uncertainty; consequently the appropriate degree of precautionary buffer remains difficult to determine. Which of these data-limited stocks are at risk of overfishing and hence in need of more complete assessments is a key step in efforts to prioritize assessment research and data collection.

Another challenge occurs even in the most data-rich situations where alternative hypotheses regarding stock productivity, reliability of data sources, model configurations and other factors leads to an ensemble of results. Traditionally, fishery scientists have tended towards using this diversity of possibilities as sensitivity analyses that characterize

the degree of structural uncertainty in the assessment result and the management advice is derived from a model configuration determined by the review process to represent the “base case” or “best” configuration. Sometimes, a subset of alternatives are used in a decision analysis framework to evaluate trade-offs among various possible management options. Even here, it is not uncommon for there to be one model run, with all its associated technical outputs, that characterizes the final management determination. Protocols are vague or nonexistent in fisheries to arrive at a conclusion that an ensemble of results collectively represents the BSIA and that management can be based on this ensemble without needing to have a single best-case result. Protocols will need to be carefully crafted so they still meet the MSA requirement that the Council cannot set the ACL above the ABC determined by the SSC.