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# TERMS OF REFERENCE

FOR THE

METHODOLOGY REVIEW PROCESS  
FOR GROUND FISH AND COASTAL  
PELAGIC SPECIES

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## **Introduction**

This document lays out general procedures for methodology and data reviews related to the assessment and management of coastal pelagic species (CPS) and groundfish by the Pacific Fishery Management Council (Council). It clarifies the responsibilities of the proponents of new methods or data sets proposed for use in CPS or groundfish stock assessment and the responsibilities of participants in the review process. Each review is likely to have additional requirements that will be defined in a set of Specific Terms of Reference (TOR), which should conform to the general terms defined in this document. Although these General Terms of Reference focus on methodology and data reviews for CPS and groundfish stock assessments, they may be applied to methods in other areas, including economic analyses and ecosystem-based fishery management. In the text below the term “methodology review” should be understood to mean “methodology and data review”.

The methodology review process provides for peer review as referenced in the 2006 Reauthorization of the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act (MSRA), which states that “the Secretary and each Regional Fishery Management Council may establish a peer review process for that Regional Fishery Management Council for scientific information used to advise the Regional Fishery Management Council about the conservation and management of the fishery” (MSRA section 302(g)(1)(E)). The peer review process is not a substitute for the Council’s Scientific and Statistical Committee (SSC), and should work in conjunction with the SSC. This document will be included in the Council’s Statement of Organization, Practices and Procedures as documentation of part of the review process that underpins the SSC’s scientific advice.

Parties involved in implementing the peer review process described here are the Council; Council staff; members of Council Advisory Bodies, including the SSC; the relevant Management Team and Advisory Panel (CPSMT and CPSAS for CPS, and GMT and GAP for groundfish); the National Marine Fisheries Service (NMFS); state agencies; and interested persons (including external reviewers).

Unlike Stock Assessment Review (STAR) Panels, methodology review panels do not occur on a regular timetable but are instead established by the Council to provide peer and in-depth review of major changes to the methodology on which stock assessments are based. Consequently, the outcomes from a methodology review are recommendations regarding whether a particular methodology should be applied in future stock assessments, and on recommended (or required) improvements and modifications. Existing methodologies could be reviewed, particularly if they are key to stock assessments and have not been reviewed for many years or if incremental changes in how the methodology is applied have occurred.

Methodology reviews may be appropriate when a major new data source is introduced or when a major change in the stock assessment modeling is contemplated. In both cases, a methodology review is needed when the change(s) from how assessments have been conducted in the past are deemed to be more than what a STAR Panel can reasonably be expected to handle. The introduction of a new survey will generally require a methodology review, as will a change to a new stock assessment modeling platform. However, changes to the structure of a previously reviewed assessment model (e.g., changes in selectivity year-blocking) fall within the scope of a standard STAR Panel review.

No explicit guidelines for what topics can be covered in a methodology review are provided here, but typical examples would be evaluation of: (a) proposed major new data types which

if included in an assessment could change its outcomes markedly (e.g., the aerial survey for Pacific sardine), (b) proposed changes to the design of existing surveys, (c) existing data inputs to assessments which have not been reviewed in depth by a Council-sponsored peer-review panel for many years (e.g., the egg production method for Pacific sardine), (d) data or model results that contribute to ecosystem-based management of CPS and groundfish stocks, and (e) proposed major changes to stock assessment methods that fall outside the scope of a normal STAR Panel review (for example, a change to the stock assessment modelling platform).

Changes to harvest control rules could also be considered by a methodological review. Care must be taken to separate the scientific analysis supporting the change (e.g. the structure and technical aspects of simulation studies used to compare a revised control rule against the *status quo*) and the management objectives used to measure performance (e.g. minimize year-to-year catch variance, maximize long-term average catch, etc.). The former are amenable to methodological review (provided adequate background analyses have been completed), but the latter are management decisions – not well suited to a methodological review.

These TOR reflect how previous methodology reviews have been undertaken. Nevertheless, no set of guidelines can be expected to deal with every contingency, and all participants should anticipate the need to be flexible and address new issues as they arise.

### ***Methodology Review Goals and Objectives***

The general goals and objectives for the methodology review process are to:

1. Ensure that research surveys, data collection, data analyses and other scientific techniques in support of CPS and groundfish stock assessments are the best available scientific information and facilitate the use of information by the Council.
2. Provide recommendations regarding whether, and if so, how a particular methodology can be applied in future stock assessments.
3. Meet the MSRA and other legal requirements.
4. Follow a detailed calendar and fulfil explicit responsibilities for all participants to produce required outcomes and reports.
5. Provide an independent external review of survey and analytical methods used to develop data to inform CPS and groundfish stock assessments.
6. Increase understanding and acceptance of CPS and groundfish research methodologies and review by all members of the Council family.
7. Identify research needed to improve assessments, reviews, surveys, analyses, and fishery management in the future.

## **Responsibilities of Methodology Review Participants**

### ***Shared Responsibilities***

All parties have a stake in ensuring adequate technical review of stock assessments and the information on which they are based. The National Marine Fisheries Service (NMFS), as the designee of the Secretary of Commerce, must determine that the best scientific advice has been used when it approves fishery management recommendations made by the Council. The Council uses statements from the SSC to determine whether the information on which it will base its recommendation represents the "best available" science. Fishery managers and scientists providing technical documents to the Council for use in management need to ensure their work is technically correct.

The Council, NMFS, and the Secretary of Commerce share primary responsibility to create and foster a successful peer review process. The Council will oversee the process and involve its standing advisory committees, especially the SSC. The SSC will designate a member to coordinate, oversee, and facilitate each methodology review. Together, NMFS and the Council will consult with all interested parties to plan, prepare terms of reference, and develop a calendar of events for each methodology review and a list of deliverables for final approval by the Council. NMFS and the Council will share fiscal and logistical responsibilities and both should ensure that there are no conflicts of interest in the process<sup>1</sup>.

The peer-review process is sponsored by the Council, because the Federal Advisory Committee Act (FACA) limits the ability of NMFS to establish advisory committees. FACA specifies a procedure for convening advisory committees that provide consensus recommendations to the federal government. The intent of FACA was to limit the number of advisory committees; ensure that advisory committees fairly represent affected parties; and ensure that advisory committee meetings, discussions, and reports are carried out and prepared in full public view. Under FACA, advisory committees must be chartered by the Department of Commerce through a rather cumbersome process. However, the Sustainable Fisheries Act exempts the Council from FACA per se, but requires public notice and open meetings similar to those under FACA.

### ***Management Team Responsibilities***

The Management Team (MT) is responsible for identifying and evaluating potential management actions based on the best available scientific information. In particular, the MT makes Annual Catch Limit (ACL) and Annual Catch Target (ACT) recommendations to the Council.

A representative of the relevant MT may be appointed by the MT chair and, if appointed, will serve as a liaison to the methodology review panel meeting and will participate in discussions. The MT representative will not serve as a member of the Panel. The MT representative should be prepared to advise the Panel on fishing regulations or practices that may influence data used in assessments and the nature of the fishery in the future (this will be more relevant for some of the topics which are considered by methodology reviews than others).

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<sup>1</sup>The proposed NS2 guidelines state: "Peer reviewers who are federal employees must comply with all applicable federal ethics requirements. Peer reviewers who are not federal employees must comply with the following provisions. Peer reviewers must not have any real or perceived conflicts of interest with the scientific information, subject matter, or work product under review, or any aspect of the statement of work for the peer review. For purposes of this section, a conflict of interest is any financial or other interest which conflicts with the service of the individual on a review Panel because it: (A) Could significantly impair the reviewer's objectivity; or (B) Could create an unfair competitive advantage for a person or organization. (C) Except for those situations in which a conflict of interest is unavoidable, and the conflict is promptly and publicly disclosed, no individual can be appointed to a review Panel if that individual has a conflict of interest that is relevant to the functions to be performed. Conflicts of interest include, but are not limited to, the personal financial interests and investments, employer affiliations, and consulting arrangements, grants, or contracts of the individual and of others with whom the individual has substantial common financial interests, if these interests are relevant to the functions to be performed. Potential reviewers must be screened for conflicts of interest in accordance with the procedures set forth in the NOAA Policy on Conflicts of Interest for Peer Review subject to OMB's Peer Review Bulletin."

### ***Advisory Panel Responsibilities***

It is the responsibility of the AP representative to ensure that AP concerns regarding the issue being reviewed are conveyed to the Panel. The chair of the AP may appoint a representative to participate in a methodology review. If appointed, the AP representative will serve as an advisor to the review meeting. The AP representative will participate in review discussions as an advisor to the Panel, in the same capacity as the MT advisor. The AP representative may provide appropriate data and advice to the review meeting and will report to the AP on the meeting.

### ***Scientific and Statistical Committee Responsibilities***

The SSC will assign at least one member to each methodology review. This member will chair the review meeting, and present the report of the meeting to the SSC and the Council. The SSC will review any additional analytical work arising from the review meeting, will serve as arbitrator to resolve disagreements that arose during the review meeting, and will make recommendations to the Council (e.g. whether the reviewed methodology provides the “best available science”, and hence could be used for stock assessment and developing conservation and management measures).

### ***Council Staff Responsibilities***

Council staff will be assigned to coordinate, monitor and document the review process. Council staff will be responsible for timely issuance of meeting notices and distribution of appropriate documents. Council staff will coordinate with the panel chair and NMFS to assure that all documents are received on time, and are complete. Council staff will coordinate materials and presentations for Council meetings relevant to Council decision making. Council staff will also collect and maintain file copies of reports from each methodology review, the documents considered during the review, SSC, Management Team, and Advisory Panel comments and reports, letters from the public, and any other relevant information.

A primary role for Council staff assigned to each methodology review will be to monitor review meetings and SSC activities to ensure compliance with these TOR. Council staff will identify inconsistencies with the TOR that occur during review meetings and work with the panel chair to develop solutions and to correct them. Council staff will work with the panel chair to finalize the panel report and provide it to the Council.

### ***National Marine Fisheries Service Responsibilities***

NMFS will assign a coordinator to work with the Council, other agencies, groups, or interested persons that carry out assessment work to assist in organizing methodology reviews. The NMFS coordinator will identify independent panellists following criteria for reviewer qualifications. The costs associated with these reviewers will be borne by NMFS. The NMFS coordinator will work with methodology proponents to facilitate delivery of materials by scheduled deadlines and in compliance with other requirements of these terms of reference, to the extent possible and with the assistance of the assigned Council staff officer and the panel chair.

### ***General Review Panel Responsibilities***

The objective of a methodology review panel is to complete a detailed evaluation of a topic selected by the Council which could have a major impact on stock assessments or the provision of scientific advice and to make a recommendation regarding whether the

methodology represents the best available scientific information for the Council. The general responsibilities of the Panel are to:

1. review documents pertinent to the topic under consideration;
2. evaluate the technical merits and deficiencies of the proposed method(s) during the panel meeting and work with the proponents to correct deficiencies;
3. provide recommendations for alternative methods or modifications to proposed methods, or both, as appropriate during the panel meeting;
4. provide recommendations on application of the methods to the stock assessment and/or management process;
5. document meeting discussions;
6. provide complete panel reports.

The panel chair has, in addition, the responsibility to:

7. review revised documents and panel reports before they are forwarded to the SSC.

Review panels may have additional responsibilities that are defined in the Specific Terms of Reference for the review.

### *Panel Composition*

Methodology review panels normally include a chair, at least one "external" member (i.e., who is outside the Council family and not involved in management or assessment of West Coast fisheries, often designated by the Center for Independent Experts [CIE]), and at least two additional members. Selection of the external and independent panellists should aim for balance between outside expertise of the topic being reviewed and in-depth knowledge of West Coast fisheries, data sets available for those fisheries, and relevant modelling approaches. Reviewers should not have financial or personal conflicts of interest, either current to the meeting, within the previous year (at minimum), or anticipated. Panellists should be knowledgeable about the specific approaches being reviewed. In addition to panel members, methodology review meetings will include Council staff to help advise the Panel and assist in recording meeting discussions and results, and may include MT and AP representatives with responsibilities as laid out above. The length of a methodology review meeting will be selected by the SSC and could range one to five days.

The panel chair is responsible for: 1) developing an agenda, 2) ensuring that the Panel follows the TOR, 3) guiding the participants in the review (proponents and Panel) to mutually agreeable solutions, 4) coordinating review of documents, and 5) providing Council staff with a camera ready and suitable electronic version of the panel report. The Panel, those proposing the methodology, the MT and AP representatives, and the public are legitimate meeting participants that should be accommodated during discussions. It is the panel chair's responsibility to manage discussions and public comment so that work can be completed.

### *Conduct of a Review*

The Panel's review solely concern technical aspects of the method. It is therefore important that the Panel strive for a risk neutral perspective in its reports and deliberations. Methods or results that have a flawed technical basis, or are questionable on other grounds, should be identified by the Panel and a recommendation made that they should be excluded from consideration in developing management advice. The Panel should comment on the degree to which the uncertainty associated with the method being reviewed is quantified (e.g. through

confidence or prediction intervals) because uncertainty is taken into account during the management process.

Recommendations and requests to the proponents for additional or revised analyses must be clear, explicit, and in writing. Panel recommendations and requests to the proponents should reflect the consensus opinion of the entire Panel and not the minority view of a single individual or individuals on the Panel. A written summary of discussion on significant technical points and lists of all panel requests and recommendations and requests to the proponents are required in the panel report, which should be completed (at least in draft form) prior to the end of the review meeting. It is the chair and Panel's responsibility to carry out any follow-up review of work that is required.

The Panel's primary duty is to conduct a peer review of the proposed methodology. Methodology panel meetings are not workshops, although the involvement of the Panel in shaping the methodology is greater during methodology reviews than during STAR Panels. This is particularly the case when the outside reviewers have considerably more experience with a given methodology than the proponents and the reviewers from within the Council family. In the course of this review, the Panel may ask for a reasonable number of additional analyses, as well as for additional details of the proposed methodology. It would not be unusual for this evaluation to result in a change to the initial methodology, provided both the Panel and the proponents agree. Panels are expected to be judicious in their requests of the proponents, recognizing that some issues uncovered during a review are best flagged as research priorities (and use of the methodology possibly deferred until those issues are resolved). The Panel should not impose as a requirement their preferred methodologies when such is a matter of professional opinion. Rather, if the Panel finds that a method is inadequate, it should document and report that opinion.

Panels and proponents are required to make an honest attempt to resolve any areas of disagreement during the review meeting. Occasionally, fundamental differences of opinion remain between the Panel and the proponents that cannot be resolved by discussion. In such cases, the Panel must document the areas of disagreement in its report. In exceptional circumstances, the proponents may choose to submit a supplemental report supporting its view, but in the event that such a step is taken, an opportunity must be given to the Panel to prepare a rebuttal. These documents will then be appended to panel report as part of the record of the review meeting. Panel members may have fundamental disagreements that cannot be resolved during the meeting. In such cases, panel members may prepare a minority report that will become part of the record of the review meeting. The SSC will then review all information pertaining to Panel or Panel/proponent disputes, and issue a recommendation.

Additional analyses required by the Panel should be completed by the proponents during the review meeting. It is the obligation of the panel chair, in consultation with other panel members, to prioritize requests for additional analyses. If follow-up work by the proponents is required after the review meeting, then it is the Panel's responsibility to track progress. In particular, the chair is responsible for communicating with proponents (by phone, e-mail, or any other convenient means) to determine if the revised analyses and documents are complete and ready to be presented to the SSC.



### *Review Panel Report*

The panel chair is responsible for preparing the final draft of the panel report, obtaining the Panel's approval, and providing the report to the Council for inclusion in the Briefing Book. The chair will appoint members of the Panel (the "external" members and other members) to act as rapporteurs who will draft the report according to guidance by the panel chair on format and level of detail. The aim of the report is to provide information to the SSC on whether it should recommend the methodology for use in Council assessments and, if necessary, what additional work must be completed before the methodology can be used. The report is not meant as a detailed summary of the methodology, nor is it meant to be the minutes of the meeting. The report may include Appendices which summarize work presented to the Panel in response to requests. The chair will solicit comment on the draft report from the proponents and the MT and AP advisors. The purpose of this review is limited to ensuring that the report is technically accurate, and reflects the discussion that occurred at the meeting, and should not be viewed as an opportunity to reopen debate on issues. The chair will be the final arbiter on wording changes suggested by proponents and the MT and AP advisors—i.e., the report is the Panel's report of the meeting. Any detailed commentary by MT and AP advisors should be drafted separately, reviewed by full advisory body, and included in the Briefing Book.

### Suggested Template for Methodology Review Panel Report

- Summary of the Methodology Review Panel meeting, containing:
  - names and affiliations of panel members;
  - topic(s) being reviewed; and
  - list of analyses requested by the Panel, the rationale for each request, and a brief summary the responses to each request.
- Comments on the technical merits and/or deficiencies of the methodology and recommendations for remedies. Comments should address each of the following issues:
  - What are the data requirements of the methodology?
  - What are the situations/stocks for which the methodology is applicable?
  - What are the assumptions of the methodology?
  - Is the methodology correct from a technical perspective?
  - How robust are results to departures from the assumptions of the methodology?
  - Does the methodology provide estimates of uncertainty? How comprehensive are those estimates?
  - Will the new methodology or data set result in improved stock assessments or management advice?
- Areas of disagreement regarding panel recommendations:
  - among panel members (including concerns raised by the MT and AP representatives); and
  - between the panel and proponents.
- Unresolved problems and major uncertainties, e.g., any issues that could preclude use of the methodology.
- Management, data or fishery issues raised by the public and MT and AP representatives during the panel review.
- Prioritized recommendations for future research and data collection.

### ***General Responsibilities Proponents of New Methodology or Data Sets***

New methods or data sets will be used in producing CPS or groundfish stock assessments (or in providing management advice) if there is a reasonable expectation that doing so will result in an improved assessment relative to a status quo assessment that did not use the new method or data set.

#### *Proposing a New Methodology for Review*

The proponents of new methods or data sets for use in CPS or groundfish stock assessments will submit a 1-2 page proposal for consideration by the SSC and the Council. The proposal should be submitted by the briefing book deadline of the appropriate Council meeting, and should address the following:

- Title
- Name of proposers (including the researchers who will participate at the methodology review and will be expected to conduct analyses during that review).
- How the proposed methodology will improve assessment and management for the stock(s) in question.
- Outline of methods (field and analytical).

Proponents of methods to be reviewed should be prepared to present their proposal to the SSC, the relevant MT, and the full Council. Proponents should also include a description of the funding, logistics, or other factors that would indicate the likelihood of success of the proposed methodology

The proposed methodology should be field tested, and preferably there will be available data for one or more years. Untested or experimental methods are typically not appropriate for this type of review.

Methodology reviews are intended for methods or data sets that apply to a range of stocks. A STAR Panel would be more appropriate for reviewing methods or data sets that apply to only one or to a small number of related stocks.

#### *Responsibilities of Methodology Proponents*

If the Council recommends review of the methodology, the proponents will appoint a representative to coordinate work with the Panel and attend the panel meeting. A representative of the proponents should attend the SSC meeting at which the outcomes from the panel review are discussed.

The proponents are responsible for preparing two versions of the methodology review document:

- 1) a "draft", including an executive summary, for discussion during the review meeting; and
- 2) a "final" version for presentation to the SSC, the Council, and the relevant Management Team and Advisory Panel.

The proponents will distribute "draft" documents fully describing the methodology to the Panel, Council staff, and the MT and AP representatives at least two weeks prior to the review meeting. The proponents are responsible for bringing analysis methods and relevant data (in digital format) to the review meeting so that data can be analyzed on site and sensitivity analyses conducted. In most cases, the proponents should produce a revised document outlining the methodology (and preliminary results / responses to the panel

recommendations) three weeks after the end of the panel meeting (including any internal agency review).

The proponents and the Panel may disagree on technical issues, but “final” documents must include a point-by-point response by the proponents to each of the panel recommendations.

The draft and final reports on the methodology should include information that addresses the following:

- Data requirements of a new methodology or documentation of how information in a new data set was collected.
- The situations/stocks for which the methodology or data are applicable.
- The assumptions of the methodology and whether those assumptions are likely to be satisfied by data sets to which the method would be applied.
- An evaluation of robustness of the methodology to departures from the underlying assumptions.
- An application of a new methodology to real or simulated data, including an evaluation of the bias and accuracy of the results.
- An evaluation of how the new method(s) or data set(s) would improve stock assessments or the provision of management advice.