

# **Pacific Scientific Advice Review Committee (PSARC)**

## **Terms of Reference**

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## EXECUTIVE SUMMARY

The Pacific Scientific Advice Review Committee (PSARC) is the Pacific Regional body responsible for review and evaluation of all scientific information on the status of living aquatic resources, their ecosystems, and on biological aspects of stock management.

PSARC provides internal and external clients with scientific information and advice that is reliable, relevant, timely and comprehensive.

PSARC advises the Resource Management Executive Committee (RMEC) and the Regional Management Committee (RMC) of Fisheries and Oceans Canada and other bodies on stock and habitat status and potential biological consequences of fisheries management actions and natural events.

Five subcommittees (Groundfish, Pelagic, Invertebrates, Salmon, and Habitat) review species and habitat issues. In addition, special PSARC meetings are convened to review high priority and cross-cutting issues independent of the subcommittee structure. PSARC serves as the primary Pacific Region forum for peer review and evaluation of scientific research and literature.

PSARC provides the scientific basis for advice on salmon, herring, invertebrate and groundfish stocks in the Pacific Region harvested currently, or with potential to be harvested, and on fish habitats and fisheries ecosystems.

### ***Steps in the Review Process***

1. The PSARC Chair, in consultation with internal clients (Science Branch, Fisheries Management and Oceans/Habitat Management), identifies annual science advice priorities by sector.
2. The objectives and rationale for requests are formally developed by the initiating client group using the Request-For-Working-Paper (RFP) form.
3. Science Branch determines the capacity to conduct the assessments and provide science advice.
4. Assessment priorities are approved annually by RMEC to ensure cross-sector and National priorities are considered as a final step in priority setting.
5. Authorship of PSARC papers is assigned by Science. Authors need to ensure that all relevant information is considered by consulting with internal and external clients as required.
6. Prepare Working Papers and Scientific Advisory Reports for PSARC meetings. Working Papers should be comprehensive, analytically rigorous, and explicitly address uncertainty.

7. Obtain written reviews of Working Papers before meetings by internal and/or external professionals in the field.
8. Review Working Papers at PSARC meetings to ensure they are technically sound and meet explicit standards for content and form. The review should resolve unclear points of data or analyses and consider ancillary information or analyses from clients if available.
9. Develop best possible scientific assessment of stock and/or habitat status or state of knowledge on science issues. Where consensus is not achieved, the merits and shortcomings of alternative interpretations of the data are specified in Advisory Documents.
10. Present Advisory Documents containing scientific information on resource status and recommended conservation measures to RMEC and sector management. Release of Science Advisory Reports follows sign-off of the appropriate Regional Director.

### **Organizational Structure**

PSARC includes a Chairpersons Committee, a Secretariat and the following five standing Subcommittees:

- Groundfish
- Pelagic
- Invertebrates
- Salmon
- Habitat

Special PSARC meetings, independent of the subcommittees, are convened to address issues of special interest as requested by RMEC.

Working Groups can be established by RMEC on an as-needed basis. Additional *ad hoc* Working Groups address issues assigned by RMEC.

PSARC provides the scientific basis for advice on salmon, pelagic, invertebrate and groundfish stocks currently harvested in the Pacific Region, or with potential to be harvested, and on fish habitats and fisheries ecosystems. PSARC serves as the primary Pacific Region forum for peer review and evaluation of scientific research and literature as well as traditional ecological knowledge.

Fisheries and Oceans Canada is committed to open and transparent peer review and advisory processes, including participation of individuals from outside the department. PSARC meeting participants are invited to PSARC meetings based on their level of expertise, knowledge and objectivity. All invited participants, including individuals employed by the department, academia, First Nations, stakeholders, other government or private institutions and the general public have full participatory rights. Observers interested in “observing” the process but wish to attend as representatives of special

interest groups rather than as impartial and objective experts can also be invited to PSARC meetings.

**Documents**

Two categories of documents are prepared for PSARC:

Draft Working Papers — A PSARC document that is the basis for peer review and advice formulation.

Draft Scientific Advisory Reports — A summary document based on a previously approved Working Paper that contains clear and jargon-free information on the status of stocks and habitats.

PSARC produces an Advisory Document after each PSARC meeting. Advisory Documents are provided to RMEC members and affected sector managers and become the Region's official records of scientific opinion.

## 1. INTRODUCTION

Fisheries and Oceans Canada is responsible for the management and conservation of Canada's fisheries resources and their habitat in marine and inland waters. This mandate requires providing scientific knowledge and advice to clients, partners and the operational Branches of Fisheries and Oceans to support their activities. The objective of the Pacific Scientific Advice Review Committee (PSARC) is to provide peer reviewed information and advice on the status of stocks, their habitats and ecosystems in the Pacific Region.

In delivering this objective, PSARC also:

- advises on resource assessment needs and reviews data collection and analytical methods employed in the stock assessment process;
- reviews information on habitat, ocean environment, fisheries, and other factors which may affect the status or trajectory of stocks, and;
- presents advice to senior management on stock and ecosystem status and on biological aspects of management, including biological objectives for management and biological consequences of management alternatives.

The principles that guide the PSARC process are:

- to provide reliable advice on the status of fish stocks and their habitat;
- to be timely, responsive and flexible to clients needs;
- to employ the most appropriate and credible scientific methods;
- to provide scientific review on the full range of regional resource management issues;
- to involve First Nations, stakeholders, other government departments, and outside scientific experts in the review process consistent with SAGE – Science Advice for Government Effectiveness – including the imperatives of openness and transparency;
- to provide a visible and public document trail, and;
- to foster interaction with other regional advisory processes, as well as facilitate the advancement of resource assessment science through the organization and participation in national meetings and workshops.

PSARC consists of a Secretariat, a Chairpersons Committee, five Subcommittees, special PSARC meetings independent of the standing subcommittees, and *ad hoc* Working Groups. The Chairperson of PSARC is appointed by and reports to the Regional Director-General and the Regional Director of Science. Subcommittee chairs are approved by RMEC, and report in their PSARC role to the Chair of PSARC.

PSARC works in consultation with the Canadian Science Advisory Secretariat (CSAS), which has a national co-ordinating role for:

- policy direction on the process of assessment and review;

- policy direction on the process for liaison with clients;
- production of reports and documents;
- interregional compatibility and exchange of information and approaches to assessment;
- identification of emergent stock and habitat assessment issues.

## **2. RESPONSIBILITIES OF THE PSARC REVIEW AND ADVISORY PROCESS**

1. PSARC is the Pacific Regional body responsible for review and evaluation of all scientific information on the status of living aquatic resources, their ecosystems, and biological aspects of stock management.
2. PSARC is the Pacific Regional body responsible for provision of advice on stock status and potential biological consequences of fisheries management actions and natural events to RMEC and other bodies.
3. PSARC reviews scientific information and knowledge, and provides advice on various fisheries, habitat, and ecosystem issues relevant to assessing status and trajectories of stocks, or otherwise referred to it by RMEC or other competent bodies.
4. PSARC provides recommendations for co-ordination of resource assessment and related projects among Divisions and Branches.

## **3. PSARC ORGANIZATIONAL STRUCTURE AND FUNCTION**

PSARC includes a Secretariat, a Chairpersons Committee, five standing Subcommittees (Groundfish, Pelagic, Invertebrates, Salmon and Habitat), and Working Groups established by the RMEC on an as needed basis. Special PSARC meetings, independent of the subcommittees, will be convened at the direction of RMEC to address high-priority and/or cross-cutting assessment issues.

### ***3.1 Responsibilities of the PSARC Chair***

The responsibilities of the Chair of PSARC are to:

- communicate proposed agendas to members;
- distribute documents in advance of meetings;
- co-ordinate preparation of the Advisory Documents;
- prepare RMEC minutes;
- co-ordinate the presentation of PSARC documents to RMEC and sector managers;
- communicate with RMEC regarding upcoming PSARC activities;
- ensure that appropriate sector managers receive feedback on decisions and actions on PSARC items;
- serve as primary contact between CSAS and PSARC; and
- participate in the annual workplanning process.



The role in workplanning is met through interacting with fisheries, oceans and habitat managers to determine the full range of Regional requests for advice to be met by PSARC, and with Science line managers to ensure the working papers required for PSARC meetings are included in annual workplans. The liaison is primarily with Regional Directors and Division Heads or their designates.

The Chair is supported in these tasks by a Secretariat, which consists of support assigned by the Regional Director of Science and supervised by the Chair of PSARC.

## 4. PSARC MEETINGS

### 4.1 *General Responsibilities of PSARC participants*

PSARC meetings serve as the primary Pacific Region forum for peer review and evaluation of scientific assessments, literature, and traditional ecological knowledge necessary for the discharge of PSARC responsibilities within their specific subject areas.

Responsibilities of PSARC participants are to:

- deliberate agenda items in ways which are rigorous, thorough, impartial, and professional;
- review all documents and traditional ecological knowledge contributed by participants, within an appropriate context for each type of contribution;
- provide a consensus interpretation of each agenda item wherever possible. Where a consensus cannot be reached, the merits and short comings of alternative interpretations are specified in the Advisory Document;
- present a clear and focused summary of the discussion of the state of knowledge and information relevant to each specific request for advice;
- provide documentation of the basis for their deliberations and discussions, in the form of Advisory Documents.

### 4.2 *Composition*

The following five Subcommittees deal with the specialized areas indicated:

PSARC Salmon Subcommittee  
PSARC Pelagic Subcommittee  
PSARC Groundfish Subcommittee  
PSARC Invertebrate Subcommittee  
PSARC Habitat Subcommittee

Additional special PSARC meetings and *ad hoc* Working Groups address issues assigned by RMEC.

Participation at PSARC meetings shall be open to all Fisheries and Oceans Canada staff interested in the scientific review of stock and habitat assessments, and provision of advice on status or other matters. Meetings are open to public participation upon invitation by PSARC meeting Chairs in consultation with the PSARC Chair (see Policy Governing Public Participation in PSARC). All participants must agree to adhere to accepted scientific standards of impartiality and objectivity on matters of fact and interpretation, and

to comply with requirements for confidentiality prior to release of documents. All external participants must also comply with such procedures as are necessary to ensure no conflicts of interest occur. The specific procedures will vary with fisheries, stocks and habitats being reviewed, but will be specified to participants.

Subcommittee Meeting Chairpersons consist of Science Section Heads or Resource Management Coordinators and Managers or designates. They are appointed on a rotational basis by RMEC for a term of two years. Chairs of special PSARC meetings held independent of the subcommittees will be identified by RMEC as required.

#### ***4.3 Responsibilities of PSARC Meeting Chairs***

Responsibilities of Chairpersons are to:

- Select appropriate external participants for PSARC meetings. External participants are selected based on their expertise, objectivity and professional judgement. Meeting Chairs should consider the degree of balance among client groups.
- communicate proposed agendas to participants and reviewers;
- co-ordinate preparations for PSARC meetings;
- review Working Papers in order to:
  - identify assessments where line management may need to establish an assessment team;
  - alert the PSARC Chairperson to possible changes in advice on stocks or other issues;
  - schedule meeting times efficiently; and
  - select appropriate reviewers;
- track the status of Working Papers in advance of meetings, and communicate with line managers or non-departmental staff to ensure compliance with deadlines;
- select internal and external reviewers of Working Papers, provide them with guidelines for their reviews, and transmit documents among authors and reviewers;
- provide the PSARC office with two copies of all Working Papers tabled at meetings, written reviews, and final approved Working Papers;
- process all PSARC documents;
- chair PSARC meetings;
- present Advisory Documents to RMEC members and sector managers as required;
- communicate to authors changes in Working Papers required to rectify deficiencies identified during the review process;
- approve Working Papers for inclusion in the CSAS Research Document and Scientific Advisory Report series once authors have made revisions as specified at PSARC meetings.

PSARC meeting Chairperson approval only recognizes that the revisions requested by PSARC have been completed. Line managers may have additional approval mechanisms required before documents are transmitted to the CSAS office.

#### **4.4 General Responsibilities of PSARC Meeting Participants**

The responsibilities of participants are as follows:

- read any distributed documents before the meetings;
- ensure that oral and written contributions comply with accepted scientific standards of objectivity and impartiality;
- ensure that Working Papers or reviews of Working Papers are not distributed except according to the approval procedures specified in the Terms of Reference of PSARC or CSAS;
- ensure all matters discussed in PSARC meetings or included in Working Papers are treated as completely confidential until release of the corresponding Advisory Document.

Written material presented by external participants will be retained and made available on request to the PSARC office. Revised Working Papers by non-departmental employees can be included in the CSAS Research Document or Scientific Advisory Report series, as long as they are accepted by the meeting participants and comply with the standards of the series.

Approved Advisory Documents become the Region's official record of scientific opinion of the topics included. Communications by individual participants on these topics should ensure that this record is presented.

The scientific basis for advice formulated by PSARC will include the status of stocks, habitats and ecosystems as well as potential consequences of specific management actions where appropriate, and will address environmental or other influences on the stocks, habitats or their aquatic ecosystems.

PSARC develops the scientific basis for advice by:

- responding to requests from RMEC directed through the Chair of PSARC;
- reviewing all pertinent information and analyses, and conducting such analyses as may be required to establish the status and trajectories of stocks, habitats or ecosystems including estimates of uncertainty;
- providing estimates of biologically-based limit reference points with an explanation of how the reference points were selected and estimated;
- providing estimates of biological consequences for specific management measures under consideration, taking into account uncertainties in analyses and underlying

biological/environmental relationships, and indicate the probability of the stock falling or remaining below a limit reference point;

- reviewing programs for assessment of stocks, habitats and ecosystems and commenting on their relevance and efficiency;
- reviewing requirements for assessment of stocks, habitats and ecosystems, and recommending to RMEC and Sector Managers programs which may be required;
- maintaining a written record of the proceedings of each meeting, documenting the recommendations and the scientific basis for such recommendations.

## 5. DOCUMENTS

### 5.1 Documents submitted to PSARC

Documents prepared for PSARC shall be in one of two categories:

- (a) Draft Working Paper - A PSARC document for review by at least one individual prior to presentation and review at a PSARC meeting.
- (b) Draft Scientific Advisory Report - A document that contains clear, concise and jargon-free information on the status of stocks and habitats or other appropriate topics.

**Working Papers** are due three weeks before the scheduled meetings. Written comments on PSARC Working Papers are required one week prior to meetings. This lead-time is required to permit authors to make appropriate changes to their Working Paper or prepare constructive responses to reviewers' comments.

Working Papers can be developed as Assessment Frameworks that document the methods, data inputs and benchmarks of biologically-based reference points for stocks and habitats. Assessment Frameworks have multi-year standing and can be updated and reviewed about 2-3 times a decade, depending on the issue. They do not contain recommendations for management *per se* but provide the basis for subsequent advice formulation as additional years of data are acquired.

Reviews of PSARC Working Papers, like other scientific reviews, are released only to meeting participants. Reviews are not distributed to participants before meetings, but are considered in meeting deliberations and Advisory Documents.

If a Working Paper is not accepted during the course of a PSARC meeting, the participants may decide not to include the summary and recommendations from the Working Paper in the Advisory Document, and/or suggest that the Working Paper be revised and re-submitted. Participants may accept only portions of Working Papers and specify revisions which must be made. Participants may also accept only some or none of the

recommendations suggested in a Working Paper, regardless of the status of the Working Paper itself, and may include additional recommendations in its Advisory Document.

PSARC Working Papers are to be marked **DRAFT** until they are accepted. Revisions to Working Papers must be completed and accepted within 45 days of review by PSARC. PSARC Working Papers cannot be cited, except within other PSARC documents.

The cover page of all Working Papers must have the following footnote: "**NOT CITABLE:** PSARC Working Papers document the scientific basis for fisheries management advice in the Pacific Region of Fisheries and Oceans Canada. As such, they provide one component of the assessment process and are not intended as comprehensive treatments of stock or habitat management."

**Science Advisory Reports** replace the CSAS Status Report Series as of April 2005. These documents summarize assessments based on previously approved Working Papers and can include updated data inputs for assessment and advice formulation. The documents must contain sufficient information to verify that the methodology is consistent with approved Working Papers. Approved Science Advisory Reports become public documents. They contain clear, concise, and jargon-free information on the status of stocks, habitat, or other appropriate topics.

Authors of Working Papers or other staff assigned by line managers prepare drafts of Science Advisory Reports. Templates for Scientific Advisory Reports are available from the PSARC Secretariat and/or the Canadian Science Advisory Secretariat. The draft reports are submitted by authors to the meeting Chair for review at the PSARC meeting. Science Advisory Reports are edited for readability and format. After the editing has been completed, the appropriate Branch Director signs off the reports. If there are sensitive issues, a briefing note will be prepared and transmitted with the documents to the affected Branch ADM(s). The Chair of PSARC prepares the letter of transmittal for the Branch Director's signature.

The PSARC Secretariat publishes and distributes the Science Advisory Reports, and the electronic form is entered on the Fisheries and Oceans Canada, Pacific Region Science Internet site, as part of the national series co-ordinated by CSAS.

## ***5.2 Documents Prepared by PSARC***

An **Advisory Document** is produced after each meeting. The Advisory Document contains an executive summary, summaries of Working Papers and other documents presented at the meeting, summaries of reviewers' comments and relevant authors' clarifications, summaries of ancillary information contributed at the meeting, and the

discussions including recommendations. Meeting Chairs are responsible for preparation of Advisory Documents. Meeting Chairs are instructed to consider formulating an Editorial Board comprised of a subset of meeting participants. The function of an Editorial Board is to complete Advisory Documents in an efficient manner should the number of meeting participants exceed a manageable number. In cases where an Editorial Board is struck, the Meeting Chairperson should solicit members of the Board to achieve a balance between internal and external meeting participants.

Following completion of Advisory Documents, the PSARC Secretariat distributes PSARC Advisory Documents to RMEC and Sector Managers as appropriate.

## **6. PSARC OPERATIONAL GUIDELINES**

Each step outlined in the overview involves a number of activities.

### ***6.1 Consultation regarding schedules and agendas***

Each year the Chair of PSARC and PSARC Meeting Chairs must have a full grasp of the range of information and advisory requirements of Fisheries and Oceans Regional fisheries managers and other groups to which PSARC provides advice. This understanding is used to develop the agendas for PSARC meetings and the list of Working Papers which must be tabled. Workplanning in the Region must accommodate these Working Papers. Also, national initiatives in the review and advisory process must be reflected in Regional activities. These needs require close consultation and exchange among PSARC, regional managers in Science, Operations, Habitat and Enhancement, Oceans, and CSAS. Science Branch is responsible for consolidating client requests and linking priorities with the capacity to deliver. RMEC will approve assessment priorities for PSARC review.

### ***6.2 Requests for Working Papers***

A formal, written Request-for-Working-Paper (RFP) is required as part of the Region priority setting exercise. The RFP includes the rationale, objectives and timeliness of science advice for proposed working papers. Development of the RFP is to be initiated by the sector seeking advice and requires input from Science Branch to ensure the objectives are achievable and the appropriate scientific standards are identified. The RFP must be signed off by line management. The RFP template is available from the PSARC website.

### **6.3 Review of data with clients**

Client groups, both internal and external, should have confidence that assessments have considered all information relevant to the stocks or issues assessed. This means that Fisheries and Oceans Canada must note and address client concerns about data to be used. If data considered relevant by client groups are not used in the assessments, then Working Papers should comment on the relevance of those data.

The review of data is best done by the scientists and biologists responsible for subsequent analyses. Opportunities for efficiencies in coverage of many stocks with a client group should be taken. The most conspicuous data consultations would be with fishers regarding data on fish. However, discussions with professionals in management, habitat, and environmental fields (marine, freshwater, climate and public interest groups) are also important.

### **6.4 Preparation of Working Papers in advance of the assessment review meeting**

Working papers should:

1. be complete in coverage of data and model structure for the models employed. Sampling and analytic methodology should be documented.
2. Environmental and habitat considerations should be covered, as well as traditional fisheries knowledge;
3. include performance statistics of models and sensitivity to alternative parameter values;
4. describe uncertainty in parameter estimates;
5. present results of alternative plausible models or incompatible data sets when they exist. Selection among models should usually be made on the basis of model performance and rationale for selection should be explained clearly. If selections are based on biological arguments, this rationale should also be explained fully;
6. not include recommendations on management actions, but include results or implications of management actions as specified by managers or RMEC if relevant;
7. be developed as an Assessment Framework, where appropriate, that includes comprehensive documentation of the methodology, data inputs and biologically-based limit reference points.
8. be developed as a Scientific Advisory Report, where appropriate, and where a previously approved and revised Working Paper exists.

### **6.5 PSARC Stock Assessment Review**

1. On receipt of a Working Paper, the Meeting Chair will send the paper to one to three reviewers, who shall return written reviews within the time specified in the Terms of Reference. The reviews will be provided to Working Paper authors in



- advance of the PSARC meeting, and authors will have the opportunity to revise the Working Paper or otherwise respond to reviewers' comments.
2. For each stock or issue being assessed there will be a presentation of data, models, and analytical content of Working Paper(s), and of reviewers' comments and authors' responses.
  3. PSARC will review Working Papers pertaining to stocks, habitats or ecosystems of interest submitted by client groups. Client group authors will participate fully in presentation and review. The same standards, deadlines, and review procedures will be applied to all Working Papers.
  4. The written reviews and PSARC meeting discussion by participants should highlight any serious problems with data, models, or the resource. The review should cover all aspects of the assessment (or other type of activity), including:
    - (i) Sampling design of all data sources.
    - (ii) Intermediate data processing steps (pooling, interpolating, smoothing, weighting, "correction factors").
    - (iii) Model algorithms.
    - (iv) Model assumptions about both processes and error structure.
    - (v) Estimation methods.
    - (vi) Measurements of uncertainty and its propagation in the analysis.
    - (vii) Sensitivity testing of model assumptions and parameters.
    - (viii) Consideration of plausible alternative models.
    - (ix) Presentation of results in a form that assures that management advice needs are addressed.
  5. Working Papers will be rejected by PSARC and may not be included in the Advisory Document if the participants conclude that the Working Paper does not meet suitable scientific standards and cannot be revised in a timely manner. Where there is a specific request for advice and the relevant Working Paper has been rejected, summaries of the Working Paper, reviewers' comments, and PSARC discussion should be included in the Advisory Document. The report should state clearly the reasons for rejecting the Working Paper and the basis for whatever advice is provided in response to the request.
  6. PSARC review can consider ancillary information and traditional ecological knowledge. Critical discussion of other types of knowledge will depend on the type and form of information or data tabled, but is kept within a scientific framework. Inclusion of the information in the Advisory Document will depend on the degree to which PSARC meeting discussions and conclusions are affected by the information. Where such information is included in the Advisory Document, the contributors of the information shall be identified.

## **6.6 Development of consensus on stock status**

1. Where possible, a consensus among all participants in the PSARC review will be developed. Where consensus is not possible, evaluations of the alternative

interpretations should be recorded. These evaluations should present the evidence supporting or contradicting each alternative, highlight the consequences of the alternatives to the interpretation of stock, habitat or ecosystem status, and, where relevant, identify the proponents of alternative interpretations.

2. The estimated uncertainty of each option or estimates which PSARC participants considers plausible should be included in the report.
3. Clear directions for the content of Science Advisory Reports or comparable communications products should be specified, including necessary figures and tables to be included.

#### **6.7 Preparation and release of scientific information, advice, and documents**

1. PSARC Advisory Documents are prepared as quickly as possible following each meeting. The Advisory Document will contain the results of PSARC deliberations and both internal and public contributions.
2. Advisory Documents are posted on the public PSARC Internet site following distribution to RMEC and affected sector managers. The PSARC Secretariat is responsible for other distribution of these documents.
3. Science Advisory Reports will be prepared for all major stocks assessed by PSARC. These reports should be brief, factual, and written for an informed public audience. They should adhere to the style and processes of CSAS and contain the material directed by PSARC meeting participants and Chairperson of PSARC. Science Advisory Reports are maintained on the Internet by CSAS in pdf format. The CSAS Research Document series will be the vehicle for releasing and archiving approved Working Papers.