

GROUND FISH STOCK ASSESSMENT AND REVIEW PROCESS DURING 1998

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Goals and Objectives

The goals and objectives for the 1998 groundfish assessment and review process* are:

- a) Ensure that groundfish stock assessments provide the kinds and quality of information required by all members of the Council family.
- b) Satisfy the MSFCMA and other legal requirements.
- c) Provide a well defined Council oriented process that helps make groundfish stock assessments the "best available" scientific information and facilitates use of the information by the Council. In this context, "well defined" means with a detailed calendar, explicit responsibilities for all participants, and specified outcomes and reports.
- d) Emphasize external, independent review of groundfish stock assessment work.
- e) Increase understanding and acceptance of groundfish stock assessment and review work by all members of the Council family.
- f) Identify research needed to improve assessments, reviews and fishery management in the future.
- g) Use assessment and review resources effectively and efficiently.

* In this document, the term "stock assessment" includes activities, analyses and management recommendations, beginning with data collection and continuing through to the development of management recommendations by the Groundfish Management Team (GMT) and information presented to the Council as a basis for management decisions.

Shared Responsibilities

The purpose of this discussion document is to help planners and the Council family understand responsibilities for the groundfish stock assessment review process during 1998. Parties involved are the National Marine Fisheries Service (NMFS), state agencies, the Council and its advisors which include the Scientific and Statistical Committee (SSC), GMT, Groundfish Advisory Panel (GAP), Council staff and interested persons. Background information and a strawman proposal are given below.

Leadership, in the context of the stock assessment review process for groundfish, means consulting with all interested parties to plan, prepare terms of reference, and develop a calendar of events and a list of deliverables. Coordination means organizing and carrying out review meetings, distributing documents in a timely fashion, and making sure that assessments and reviews are completed according to plan. Leadership and coordination both involve costs, both monetary and time, which have not been calculated but are likely substantial.

All parties have a stake in assuring adequate technical review. The NMFS must determine that the best scientific advice has been used when it approves fishery management recommendations made by the Council. The Council uses advice from its SSC to determine whether the information on which it will base its recommendation is technically sound. Agencies and scientists providing technical documents to the Council for use in management need to assure that the work is technically correct. Program reviews, in-depth external reviews, and peer-reviewed scientific publications are used by the agencies to provide quality assurance for the basic scientific methods used to produce stock assessments. However, the time-frame for this sort of review is not suited to the routine examination of assessments that will shortly become the primary basis for a harvest recommendation. Review of current stock assessments requires a routine, dedicated effort that simultaneously meets the needs of NMFS, the Council, and others.

History

In 1995 and earlier years, stock assessments were examined at a very early stage during ad-hoc stock assessment review meetings (one per year). SSC and GMT members often participated in the ad-hoc review meetings and provided additional review of completed stock assessments during regular Council meetings. There were no terms of reference or meeting reports from the informal ad-hoc review meetings. NMFS provided leadership and coordination by setting up meetings. Each agency or Council paid their own travel costs. Council staff distributed meeting announcements and some background documents. Council paid for publication of assessments as appendices to the annual SAFE document.

A key event occurred in July 1995 when NMFS convened an independent external review of west coast groundfish assessments.¹ The review report included advice that: 1) uncertainties associated with assessment advice were understated; 2) technical review of groundfish assessments should be more structured and involve more outside peers; and 3) the distinction between scientific advice and management decisions was blurred. Work to develop a process for reviewing groundfish stock assessments was aimed at resolving these problems.

For 1996, the groundfish stock assessment review process was expanded to include: 1) terms of reference for the review meeting; 2) an outline for the contents of stock assessments; 3) external anonymous reviews of previous assessments; and 4) a review meeting report.² Plans were drawn up during March and April Council meetings and NMFS convened a week long review meeting in Newport, OR where preliminary groundfish stock assessments were discussed. The expanded process itself was reviewed by the Council family at a special "post-mortem" meeting at the end of the year. Leadership and planning at this stage was probably distributed among the SSC Groundfish Subcommittee, NMFS, GMT and persons who participated in planning discussions during the March and April Council meetings. There was no formal coordination except for the review meeting terms of reference, organization of the review meeting by NMFS, and as provided by Council staff for publication of documents. Costs were shared as in previous years.

The review process for 1997 was further expanded based on a planning meeting in December, 1996.³ It was agreed that agencies, including NMFS and state agencies, conducting stock assessments had responsibility to make sure assessments were technically sound and adequately reviewed. A *Council-oriented* review process was developed that included agencies, the GMT, GAP and other interested members in the Council family. The process was jointly funded by the Council and NMFS, with NMFS hosting the STAR Panel meetings and paying the travel expenses of the external reviewers, and the Council paying for travel expenses of the GAP and non-federal GMT and SSC members.

The expanded process for 1997 included: 1) goals and objectives; 2) three Stock Assessment Review (STAR) Panels that included external membership; 3) terms of reference for STAR Panels; 4) terms of reference for Stock Assessment (STAT) Teams; 5) a refined outline for stock assessments; 6) external anonymous reviews; 7) a clearer distinction between science and management; and 8) a calendar of events with clear deliverables, dates and well defined responsibilities. For the first time, STAR Panels and STAT Teams were asked to provide "decision table" analyses of the effects of uncertain management actions and to provide information required by the GMT in choosing harvest strategies. In addition, STAR Panels were asked to prepare "Stock Summaries" that described the essential elements of stock assessment results in a concise, simple format.

¹Anon. 1995. West coast groundfish assessments review, August 4, 1995. Pacific Fishery Management Council. Portland, OR.

²Brodziak, J., R. Conser, L. Jacobson, T. Jagielo, and G. Sylvia. 1996. Groundfish stock assessment review meeting - June 3-7, 1996 in Newport, Oregon. *In: Status of the Pacific coast groundfish fishery through 1996 and recommended acceptable biological catches for 1997.* Pacific Fisheries Management Council. Portland, OR.

³Meeting Report, Proposals and Plans for Groundfish Stock Assessment and Reviews During 1997 (May 8, 1997). Pacific Fishery Management Council, 2130 SW Fifth Avenue, Suite 224, Portland, OR 97201.

At the end of 1997, a post-mortem review meeting was convened to discuss events and to make recommendations for 1998.⁴ Discussants concluded that objectives were, to varying degrees, achieved during 1997. Least progress was made in the area of "increasing acceptance and understanding by all members of the Council family." The most significant issues seemed to be the nature of the STAR Panels' responsibilities, communicating uncertainty to decision makers, workload and inexperience in conducting the review process.

In retrospect, there was no formal coordination and leadership except for the terms of reference and the calendar. As in previous years, Council staff coordinated distribution of meeting announcements and distribution of documents. Costs increased substantially due to travel for external experts, increased number of review meetings (three instead of one), and distribution of larger and additional reports. NMFS paid travel and other costs for external members of STAR Panels. Other costs were distributed as in 1996. It was not possible for Council to copy and distribute all of the stock assessments because of limited funds.

FACA

Sponsorship of the review process will remain with the Council in 1998 because the Federal Advisory Committee Act (FACA) controls NMFS' ability to set up new advisory committees. FACA specifies a process and constraints for setting up advisory committees, particularly when the committee will provide *consensus* recommendations to the federal government. Under FACA, advisory committees must be chartered by the Department of Commerce through a process which is difficult and slow. The intent of FACA was to limit the number of advisory committees, ensure that advisory committees fairly represent affected parties, and insure that advisory committee meetings, discussions and reports are carried out and prepared in full public view.

Under the Magnuson-Stevens Act the Council is exempt from FACA, however the Act provides protections similar to those under FACA in its requirements for public notice and open meetings.

Strawman

All parties share responsibilities in the stock assessment and review process for 1998. The Council will continue to sponsor the process and involve its standing advisory committees, but it has little additional resources to contribute to coordination or costs. Funding will be shared by NMFS and the Council. The following strawman was prepared based on these facts and constraints.

Draft Statement of Shared Responsibilities

The Council has responsibility to make decisions and make policy choices about groundfish management based on the Fishery Management Plan for Pacific Coast Groundfish, the Magnuson-Stevens Act and other applicable law.

The Pacific Fishery Management Council will sponsor a review of groundfish stock assessments prepared in 1998 according to the interim protocols identified below. Sponsorship will involve consulting with all interested parties to plan, prepare terms of reference, and develop a calendar of events and a list of deliverables. NMFS and the Council will share fiscal and logistical responsibilities.

NMFS will work with the Council, other agencies, groups or interested persons that carry out assessment work to organize STAT Teams and STAR Panels, and make sure that work is carried out in a timely fashion according to the calendar and terms of reference. NMFS will provide a senior scientist to coordinate these tasks with assistance from the PFMC staff. NMFS will convene a pre-assessment meeting where STAT Teams, GAP representatives, and interested parties meet to discuss upcoming stock assessments, external reviews, and data.

⁴Jacobson, L.D. (ed.). 1997. Comments, issues and suggestions arising from the groundfish stock assessment and review process during 1997. Report to the Pacific Fishery Management Council (Revised Supplemental Attachment B.9.b, November 1997).

The SA coordinator, in consultation with the SSC, will select STAR Panel chairs, and will coordinate the selection of external reviewers with panel chairs following criteria for reviewer qualifications, nomination and selection. The public is welcome to nominate qualified reviewers.

NMFS, state agencies or others that carry out assessments or technical work in connection with groundfish assessments have the responsibility to ensure that they are technically sound and complete. The Council's review process is the principal means for review of complete stock assessments, although additional in-depth technical review of methods and data is desirable.

Council staff will publish and distribute meeting notices, stock assessment documents, stock summaries, meeting minutes and other appropriate documents. Council staff will help NMFS and agencies coordinate meetings and events.

The Council's Statistical and Scientific Committee (SSC) will participate in the stock assessment review process and provide the Council with technical advice related to the stock assessments and the review process.

The Council's Groundfish Management Team (GMT) will appoint representatives to track each stock assessment, who will attend STAR Panel meetings, and participate in review discussions. The GMT will provide the Council with advice on management of groundfish stocks based on stock assessments and other available information.

The Council's Groundfish Advisory Subpanel (GAP) will appoint representatives to track each stock assessment, who will attend STAR Panel meetings and participate in review discussions

Stock Assessment Priorities

Periodic stock assessments for west coast groundfish are conducted to determine appropriate harvest levels. Assessments rely upon a combination of NMFS survey data and state fishery monitoring data. To the extent possible, other fishery dependent data are also used.

Under the new stock assessment process begun in 1997, the time involved in soliciting data and preparing and reviewing stock assessments has increased substantially. Using STAT Teams and STAR Panels has also required participation by a larger number of people. In order to provide more thorough assessments and more complete reviews, the Council needs to establish priorities for conducting stock assessments. These priorities should be discussed at the Council's June meeting in order to allow sufficient time to begin data gathering for the species to be assessed. The following general principles will be used in setting priorities each year:

- 1) No more than 2 assessments will be reviewed by a STAR Panel;
- 2) Until more fiscal and personnel support is obtained, assessments (except for Pacific whiting) normally will be conducted only once every three years;
- 3) Assessments will be scheduled to take advantage of new data, including especially survey data;
- 4) Assessments may be conducted more frequently than once every three years if --
 - A) new data, including fishery dependent and anecdotal data, which indicate unforeseen increases or decreases in stock size, are brought to the attention of the Council,
 - B) the Council believes that the results of a stock assessment are sufficiently in dispute to warrant a re-assessment the following year, or
 - C) A fishery for a species, stock, or stock complex has rapidly developed and that species, stock, or stock complex has not been assessed recently;
- 5) An update or report that falls short of a full assessment may be prepared for a species, stock, or stock complex to provide information helpful to the Council in making management decisions.
- 6) Any stock assessment submitted by the public should be submitted through the normal Council channels and reviewed at Stock Assessment Review (STAR) Panel meetings.

Based on these general principles, and taking into account testimony presented at the November, 1997 Council meeting, the following list of stock assessments for 1998 and the preliminary list for 1999 are recommended for adoption by the Council:

1998 Stock Assessments

Sablefish
Shortspine thornyhead
Chilipepper rockfish
Blackgill rockfish
Pacific Ocean perch
Black rockfish

In addition, Pacific whiting will be assessed, but the timing will be offset (late 1998 - early 1999) in order to take advantage of the 1998 hydro-acoustic survey data. Along with the full assessments, a preview report will be prepared for grenadier and some California rockfish species for which new data is available.

1999 Stock Assessments (Preliminary)

Ling cod (may be limited to southern area only)
Petrale sole
Grenadier
Bocaccio
Canary rockfish
English sole
Near shore rockfish (with emphasis on California species)
Pacific whiting
Sablefish

Because the 1999 preliminary list is likely to exceed the time, money, and personnel resources available, this list will be further refined in 1998, based on the priorities adopted by the Council.

Terms of Reference for Groundfish STAR Panels and Review Meetings

Composition: STAR Panels normally include a chair, at least one "external" member (outside the Council family and not involved in management or assessment of west coast groundfish), and one SSC member. The total number of STAR members should be at least "n+2" where n is the number of stock assessments and "2" counts the chair and external reviewer. In addition to official members, STAR meetings will include GMT and GAP advisory with responsibilities laid out in their terms of reference. STAR Panels normally meet for one week. The number of assessments reviewed should not exceed two.

The STAR Panel and chair's main responsibility is to carry out these terms of reference according to the calendar for groundfish assessments.

The goal of the STAR Panel meeting is to review assessments for stocks according to these terms of reference. This work (described in detail below) includes reviewing draft stock assessment documents and any other pertinent information (e.g.; external anonymous reviews of the previous assessment, STAR Panel reviews of previous assessments and previous assessments, if available), working with STAT Teams to make sure necessary revisions are made to stock assessment documents, documenting meeting discussions, and reviewing summaries of stock status (prepared by STAT Teams) for inclusion in the SAFE document.

Most groundfish stocks are assessed infrequently (every three years) and each assessment and review should result in useful advice to the Council. It is the STAR Panel's responsibility to identify assessments that cannot be reviewed or completed for any reason.

The STAR Panel's terms of reference concern technical aspects of stock assessment work. The STAR Panel should strive for a risk neutral approach in its reports and deliberations. The full range of uncertainty should be reflected in complete stock assessments and the reports prepared by STAR Panels. The STAR Panel should identify scenarios that are unlikely or have a flawed technical basis.

The STAR Panel, STAT Team and all interested parties are legitimate meeting participants that must be accommodated in discussions. It is the STAR Panel chair's responsibility to manage discussions and public comment so that work can be completed.

Panel members are responsible for determining if a stock assessment document is sufficiently complete according to the "Outline for Groundfish Stock Assessments."

A STAT Team and STAR Panel may disagree on technical issues. If the STAR Panel and STAT Team disagree, the STAR Panel must document the areas of disagreement in its report. The STAR Panel may request additional analysis based on alternative approaches. It is expected that the STAT Team will make a good faith effort to complete these analyses.

The STAR Panel's decision that a stock assessment is complete should be made by consensus. If panel cannot reach agreement, then the nature of the disagreement must be described in the panel's report.

Recommendations and requests to the STAT Team for additional or revised analyses must be clear, explicit and in writing. All recommendations and requests to the STAT Team should be preserved in the meeting report.

A written summary of discussion on significant technical points and a lists of all STAR Panel recommendations and requests to the STAT panel are required in the STAR Panel's report. This should be completed (at least in draft form) prior to the end of the meeting. It is the chair and panel's responsibility to carry out any follow-up review work that is required.

Additional analyses required in the stock assessment should be completed during the STAR Panel meeting. If follow-up work by the STAT Team is required after the review meeting, then it is the chair and panel's responsibility to track the STAT Team's progress. In particular, the chair is responsible for meeting with all panel members (by phone, e-mail or any convenient means) to determine if the revised stock assessment and documents are complete and ready to be used by managers in the Council family. If stock assessments and reviews are not complete at the end of the STAR Panel meeting, then the work must be completed prior to the GMT meeting where the assessments and preliminary ABC levels are discussed.

A panel representative is expected to attend meetings where stock assessments and harvest projections are discussed to explain the reviews and provide other technical information and advice.

The chair is responsible for providing Council staff with a camera ready and suitable electronic version of the panel's report for inclusion in the annual "Status of the Pacific Coast Groundfish Fishery" report.

The STAT Team and the STAR Panel may disagree on technical issues regarding an assessment, but a complete stock assessment must include a point by point response by the STAT Team to each of the STAR Panel recommendations. Estimates and projections representing all sides of the disagreement need to be presented, reviewed, and commented on by the SSC.

Suggested Template for STAR Panel Report

Minutes of the STAR Panel meeting containing:

Name and affiliation of STAR Panel members

List of analyses requested by the STAR Panel

Comments on the technical merits or deficiencies in the assessment and recommendations for remedies

Explanation of areas of disagreement regarding STAR Panel recommendations (1 among STAR Panel members (majority and minority reports), 2) between the STAR Panel and STAT Team

Unresolved problems and major uncertainties: (Any special issues that complicate scientific assessment, questions about the best model scenario, etc.)

Prioritized recommendations for future research and data collection

Terms of Reference for Groundfish STAT Teams

The STAT Team will carry out its work according to these terms of reference and the calendar for groundfish stock assessments.

Each STAT Team will appoint a representative who will attend the pre-assessment planning meeting if one is held. STAT Teams are encouraged to also organize independent meetings with industry and interested parties to discuss issues, questions and data.

Each STAT Team will appoint a representative to coordinate work with Stock Assessment Review (STAR) panel and attend the STAR Panel meeting.

Each STAT Team will appoint a representative who will attend the GMT meeting (usually in August) and Council meeting (usually in September) where preliminary ABC and HG levels are discussed. In addition, a representative of the STAT Team should attend the GMT (usually September or October) and Council meeting (usually November) where final ABC and HG levels are discussed, if requested or necessary.

The STAT Team is responsible for preparing three versions of the stock assessment document: 1) a "draft" for discussion at the stock assessment review meeting; 2) a revised "complete draft" for distribution to the GMT, SSC, GAP and Council for discussions about preliminary ABC and HG levels; 3) a "final" version published in the "Status of the Groundfish Fishery" report. Other than authorized changes, only editorial and other minor changes should be made between the "complete draft" and "final" versions. The STAT Team will distribute "draft" assessment documents to the STAR Panel, Council, GMT and GAP advisors at least one week prior to the STAR Panel meeting.

The STAT Team is responsible for bringing computerized data and working assessment models to the review meeting in a form that can be analyzed on site. STAT Teams should take the initiative in building and selecting candidate models. If possible, the STAT Team should have several complete models and be prepared to justify model recommendations.

The STAT Team is responsible for producing the complete draft by the end of the STAR Panel meeting. In the event that the complete draft is not completed, the team is responsible for completing the work as soon as possible and to the satisfaction of the STAR Panel at least one week before the GMT meeting.

The STAT Team and the STAR Panel may disagree on technical issues regarding an assessment, but a complete stock assessment must include a point by point response by the STAT Team to each of the STAR Panel recommendations. Estimates and projections representing all sides of the disagreement need to be presented, reviewed, and commented on by the SSC.

GMT Responsibilities

The GMT is responsible for identifying and evaluating potential management actions based on the best available scientific information. In particular, the GMT makes ABC recommendations to the Council based on estimated stock status, uncertainty about stock status and socioeconomic and ecological factors. The GMT will use stock assessments, STAR Panel reports, and other information in making their ABC recommendation. The GMT's preliminary ABC recommendation will be developed at a meeting that includes representatives from the SSC, STAT Teams, STAR Panels, and GAP. A representative(s) of the GMT will serve as a liaison to each STAR Panel, but will not serve as a member of the panel. The GMT will not seek revision or additional review of the stock assessments after they have been reviewed by the STAR Panel. Successful separation of scientific (STAT Team and STAR Panels) from management (GMT) work depends on stock assessment documents and STAR reviews being completed by the time the GMT meets to discuss preliminary ABC and HG levels. However, the GMT can request additional model projections, based on reviewed model scenarios, in order to develop a full evaluation of potential management actions.

GAP Responsibilities

The Chair of the Groundfish Advisory Subpanel (GAP) will appoint a representative to track each stock assessment. GAP representatives will be appointed at the GAP meeting in March.

The GAP representative will attend the STAR Panel meeting where the assessment of his / her species is reviewed. The GAP representative will participate in review discussions as an advisor to the STAR Panel, in the same capacity as the Groundfish Management Team (GMT) advisor.

The GAP representative will attend the August GMT meeting along with STAR, STAT, and SSC representatives and will attend subsequent GMT, Council, and other necessary meetings where the assessment of his / her species is discussed.

The GAP representative will provide appropriate data and advice to the STAR panel and GMT and will report to the GAP on STAR Panel and GMT meeting proceedings.

SSC and Council Staff Responsibilities

Scientific and Statistical Committee

The Council's Scientific and Statistical Committee (SSC) will participate in the stock assessment review process and provide the Groundfish Management Team (GMT) and Council with technical advice related to the stock assessments and the review process. As in 1997, the SSC may solicit anonymous external reviews of the previous stock assessments. These external anonymous reviews should be completed in time for discussion at the pre-assessment planning meetings identified in the calendar for the 1998 review process. The SSC will assign one member from its Groundfish Subcommittee to each STAR Panel. This member is expected to attend the assigned STAR Panel meeting, the August and October GMT meeting, and the September and November Council meetings when groundfish stock assessment agenda items are discussed. The SSC, during their normally scheduled meetings, will also serve as arbitrator to resolve any disagreements that may arise between the STAT Team, STAR Panel, or GMT. The SSC will provide review of any additional analytical work on any of the stock assessments required or carried out by the GMT after the stock assessments have been reviewed by the STAR Panels. In addition, the SSC will review and advise the GMT and Council on projected ABCs and Harvest Guidelines.

The STAT Team and the STAR Panel may disagree on technical issues regarding an assessment, but a complete stock assessment must include a point by point response by the STAT Team to each of the STAR Panel recommendations. Estimates and projections representing all sides of the disagreement need to be presented, reviewed, and commented on by the SSC

Council Staff

Council Staff will prepare meeting notices and distribute stock assessment documents, stock summaries, meeting minutes, and other appropriate documents. Council Staff will help NMFS and the State Agencies in coordinating stock assessment meetings and events. The Staff will also publish or maintain file copies of reports from each STAR Panel (containing items specified in the STAR Panel's term of reference), the outline for groundfish stock assessment documents, comments from external reviewers, SSC, GMT, and GAP, letters from the public, and any other relevant information.. At a minimum, the stock assessments (STAT Team reports, "STAR Panel reports, and stock summaries) should be published and distributed in the Council's annual "Status of the Groundfish Fishery" SAFE document. Once the Council's final ABCs, HGs, and management measures have been implemented, the Staff will publish an addendum to the SAFE documenting these final values.

Calendar⁵

| | |
|-----------|--|
| Jan 12-13 | Planning meeting involving representatives of Council, States, NMFS, SSC, GMT, GAP and Council staff at Council office in Portland. Stocks to be assessed in 1998 selected. Provisional list of 1999 stocks developed. |
| Jan 19 | Planning meeting rapporteurs send revised meeting documents to members. |
| Jan 26 | Comments on documents due to rapporteurs. |
| Jan 30 | NMFS appoints a senior scientist as coordinator for process. |
| Feb 9 | Rapporteurs send final documents to Council staff. |
| Feb 9-12 | GMT meeting at Council office in Portland. GMT advisers to STAR Panels appointed. |
| Feb 13 | NMFS/agencies appoint STAR Panel chairs and members and STAT Team members. |
| Feb 13 | Staff compiles completed report on process to be included in March briefing book. |
| Feb 13 | SSC may send previous stock assessments out for external anonymous review. |
| Mar 2-5 | GAP/GMT/SSC meet in Portland. GAP advisers to STAR Panels appointed. SSC adopts outline for stock assessments and reviews process report. |
| Mar 9-13 | Council meeting at Clarion Hotel in Millbrae. Council adopts process and calendar for 1998 (scheduled for Mar. 12). |
| Mar 20 | SSC sends completed external anonymous reviews (if any) to STAT Teams. |
| Apr 6-10 | Council meeting at Columbia River Doubletree. |
| Apr 21-22 | NMFS/agency sponsored "pre-assessment" meeting where STAT Teams, GAP representatives and interested parties meet to discuss upcoming stock assessments, external reviews and data. |
| Jun 1-4 | GMT meeting. |
| Jun 5 | Council staff and STAR Panel members (including GMT and GAP advisers) receive draft assessments for POP and black, blackgill and chilipepper rockfish. |
| Jun 8-9 | Staff distributes draft rockfish assessments to Council, GMT, GAP, SSC and interested persons who have requested them ⁶ . |
| Jun 15-19 | STAR Panel for black rockfish and POP and STAR Panel for chilipepper and blackgill rockfish meet in Olympia. |

⁵ Since time between receipt of documents and STAR meetings is limited, Council staff can only fulfill distribution responsibilities if documents are received by the deadlines specified in this calendar. If documents are late, the Council staff will simply provide mailing labels to the authors so the documents may be distributed directly from the source.

⁶ In June and September, Council staff will query Council family on which drafts of which stock assessment documents they wish to receive, and circulate a notice of availability for the public. These lists will determine who receives stock assessment documents throughout the process.

- Jun 22-26 Council meeting at Sea-Tac Red Lion.
- Jun 26 Council staff and STAR Panel members (including GMT and GAP advisers) receive draft sablefish and shortspine thornyhead assessments from STAT Teams.
- Jun 29-30 Council staff distributes draft sablefish and shortspine assessments to Council, GMT, GAP, SSC and interested persons who have requested them.
- Jul 6-10 STAR Panel for sablefish and shortspine thornyhead meets in Newport.
- Jul 31 Complete assessments, stock summaries, STAR Panel reports, and other documents used during the STAR Panel meeting arrive at Council office.
- Aug 3 Council staff distributes complete assessments and STAR Panel reports to GMT, Council, SSC, GAP and interested persons who have requested them.
- Aug 10-14 GMT meeting to review stock assessment results attended by STAR Panel chairs or designees, SSC members of STAR Panels, STAT Team representatives, and GAP advisers to STAR Panels.
- Sep 3 Council staff distributes briefing book for September meeting.
- Sep 14-18 Council/SSC/GMT/GAP meeting at Red Lion in Sacramento. Council adopts preliminary ABCs and harvest guidelines. STAR Panel and STAT Team representatives attend.
- Sep 28-Oct 2 GMT meeting attended by STAR Panel chairs or designees, SSC members of STAR Panels, STAT Team representatives, and GAP advisers to STAR Panels.
- Sep 29 Final stock assessments, stock summaries, and STAR Panel reports arrive at Council office (camera-ready hard copy) for SAFE report.
- Oct 13 Council staff mails SAFE report and appendices to Council family and public who have requested them.
- Oct 22 Council staff distributes briefing book for November meeting.
- Nov 2-6 Council/SSC/GMT/GAP meeting at Columbia River Doubletree. Final harvest levels for 1999 adopted. Post-mortem on 1998 assessment and review process.

Outline for Groundfish Stock Assessment Documents

This is an outline of items that should be present in all stock assessment and fishery evaluation (SAFE) reports for groundfish managed by the Pacific Fishery Management Council. The outline is a working document meant to provide assessment authors with flexible guidelines about how to organize and communicate their work. All items listed in the outline may not be appropriate or available for each assessment. In the interest of clarity and uniformity of presentation, stock assessment authors and reviewers are encouraged (but not required) to use the same organization and section names as in the outline.

This outline for 1998 includes suggestions from many parties and is based on a similar outline used during the 1997 groundfish stock assessment cycle.

OUTLINE FOR GROUND FISH STOCK ASSESSMENT DOCUMENTS

- 1) Title page and list of preparers-the names and affiliations of the stock assessment team (STAT) either alphabetically or as first and junior authors
- 2) Executive Summary (see attached template)
- 3) Introduction
 - A) Scientific name, distribution, stock structure, management units
 - B) Important features of life history that affect management (e.g.; migration, sexual dimorphism, bathymetric demography, etc.)
 - C) Important features of current fishery and relevant history of fishery
 - D) Management history (e.g. changes in mesh sizes, trip limits, harvest guidelines, etc.)
 - E) Management performance-a table or tables comparing ABC, harvest guidelines, landings and catch (landings plus discard) for each area and year
- 4) Assessment
 - A) Data
 - i) Landings by year and fishery, discards (generally specified as a percentage of total catch in weight and in units of mt), catch-at-age, weight-at-age, survey and CPUE data, data used to estimate biological parameters such as growth rates, maturity schedules and natural mortality with CV's or variances if available.
 - Include complete tables and figures if practical
 - Sample size information for length and age composition data by area, year, gear, market category, etc.
 - B) History of modeling approaches used for this stock
 - i) Changes between current and previous assessment models

C) Model description

- i) Assessment program with last revision date (i.e.; date the executable program file was compiled).
- ii) List and description of all likelihood components in the model.
- iii) Constraints on parameters, selectivity assumptions, natural mortality, assumed level of age reader agreement or assumed ageing error (if applicable), and other assumed parameters
- iv) Description of stock-recruitment constraint or components
- v) Critical assumptions and consequences of assumption failures
- vi) Convergence criteria
- vii) Treatment of discards (generally specified as a percentage of total catch in weight and in units of mt)
- viii) Complete description of any new modeling approaches.

D) Model selection and evaluation

- i) Evidence of search for balance between realistic (but possibly over-parameterized) and simpler (but not realistic) models
 - Use hierarchical approach where possible (e.g. asymptotic vs. domed selectivities, constant vs. time varying selectivities, etc.)
- ii) Residual analysis (e.g.; residual plots, time series plots of observed and predicted values, or other approach)
- iii) Convergence status and convergence criteria for “base-run(s)”
 - Randomization run results or other evidence of search for global best estimates
- iv) Do parameter estimates make sense, are they credible?
- v) Table listing all parameters in the stock assessment model used for base runs, their purpose (e.g.; recruitment parameter, selectivity parameter, etc.) and whether or not the parameter was actually estimated in the stock assessment model.

E) Base-run(s) results

- i) Time series of total and spawning biomass, recruitment and fishing mortality or exploitation rate estimates (table and figures)
- ii) Selectivity estimates (if not included elsewhere)
- iii) Stock-recruitment relationship

- F) Uncertainty and sensitivity analyses
- i) Sensitivity analyses (tables or figures) that show ending biomass levels or likelihood component values obtained while systematically varying emphasis factors for each type of data in the model. Likelihood profiles for parameters or biomass levels may also be used.
 - ii) The best approach for describing uncertainty and the range of probable biomass estimates in groundfish assessments may depend on the situation. Approaches used in the past are listed below.
 - CV's for biomass estimated by bootstrap, implicit autodifferentiation, or the delta method
 - Subjective appraisal of magnitude and sources of uncertainty
 - Comparison of alternate models
 - Comparison of alternate assumptions about recent recruitment
 - iii) If a range of model runs (e.g.; based on CV's or alternate assumptions about model structure or recruitment) is used to depict uncertainty, then it is important that some qualitative or quantitative information about relative probability be included. If no statements about relative probability can be made, then it is important to state that all scenarios (or all scenarios between the bounds depicted by the runs) are equally likely.
 - iv) If possible, ranges depicting uncertainty should include at least three runs: one judged most probable; at least one that depicts the range of uncertainty in the direction of lower current biomass levels; and one that depicts the range of uncertainty in the direction of higher current biomass levels. The entire range of uncertainty should be carried through stock projections and decision table analyses.
 - v) Retrospective analysis (information about retrospective bias in base model or models for each area)
 - vi) Historical analysis (plot showing actual estimates from current and previous assessments for each area)
 - vii) Simulation results (if available)
- 5) Target fishing mortality rates (if changes are proposed)
- 6) Harvest projections and decision tables
- 1) Harvest projections and decision tables should cover the full range of uncertainty about current biomass and the full range of candidate fishing mortality targets used for the stock or requested by the GMT
 - ii) Information presented should include three year biomass and yield projections
- 7) Management recommendations
- 8) Research needs (prioritized)
- 9) Acknowledgments-include STAR Panel members and affiliations as well as names and affiliations of persons who contributed data, advice or information but were not part of the assessment team
- 10) Literature cited

- 11) Tables and figures
- 12) Brief response to all points raised by external anonymous reviewers. Respond to each point (e.g.; "suggestion carried out", "suggestion not carried out because . . ." or "good idea for future research but I didn't do it this time because . . .").
- 13) Complete parameter files for base runs.

Template for Summary of Stock Status Prepared by Stat Teams

Stock: (Species/area)

Catches: (Trends and current levels-include table for last ten years and graph with long term data)

Data and assessment: (Date of last assessment, type of assessment model, data available, new information, and information lacking.)

Unresolved problems and major uncertainties: (Any special issues that complicate scientific assessment, questions about the best model scenario, etc.)

Reference points: (Management targets and definition of overfishing.)

Stock biomass: (Trends and current levels relative to virgin or historical levels, description of uncertainty-include table for last ten years and graph with long term estimates)

Recruitment: (Trends and current levels relative to virgin or historical levels-include table for last ten years and graph with long term estimates)

Exploitation status: (Exploitation rates-include table for last ten years and graph with long term estimates. Exploitation rates are total catch divided by exploitable biomass.)

Management performance: (original ABC estimates, original HG specifications, overfishing levels, actual catch including discard, and discard).

Forecasts: (normally three-year forecasts of catch and biomass)

Decision table: (if available)

Recommendations for future research and data collection:

Sources of additional information: (Cite STAR Panel report, assessment documents and other useful or non-technical sources).