

A Guide to External Reviews of Alaska Groundfish Assessments

Background

The Alaska Fisheries Science Center is the primary institution responsible for groundfish stock assessments. Assessment Authors prepare assessments for groundfish stocks and stock complexes managed under the Fishery Management Plan (FMP) for the groundfish fisheries of the Bering Sea and Aleutian Islands Region and the FMP for the groundfish fisheries of the Gulf of Alaska. These assessments are subject to in-house review before dissemination to the Plan Teams, Scientific and Statistical Committee (SSC), and Council as part of the respective Stock Assessment Fishery Evaluation (SAFE) report process.

The Center regularly requests independent external reviews of a sub-set of assessments. External reviews are typically conducted through the Center of Independent Experts (CIE). The CIE provides qualified external reviewers who perform a comprehensive review of the assessment. The Assessment Author considers the comments of the reviewer and seeks to address issues or concerns raised during the process. The reviewer's comments and the Assessment Author's responses (if any) are provided to the Plan Teams and SSC for their information and consideration.

The AFSC prepared guidelines for preparation of the stock assessments which were approved by the Plan Teams and SSC (Attachment 1). The Bering Sea Aleutian Islands and Gulf of Alaska Groundfish FMPs require that draft SAFE reports be produced each year in time for the October and December meeting of the North Pacific Fishery Management Council (NPFMC). These drafts are assembled and reviewed at meetings of the Groundfish Plan Teams held in September and November. The draft reports prepared for the October meeting of the NPFMC are limited to assessments where substantial changes to the information used in the assessment or the model structure are proposed. To ensure adequate time for internal review of stock assessments, a pair of due dates will be established annually. These due dates typically will precede the respective Plan Team meetings by three to four weeks to allow time for internal review, reproduction and distribution of the report, and review by members of the Plan Team.

The current guidelines for submission of SAFE chapters from Assessment Authors do not address procedures for external reviews of assessments. While Assessment Authors welcome expert advice on their assessments, there are substantial time commitments associated with these additional stock assessment reviews. Given the growing interest in external reviews, the SSC recommends that the Council adopt guidelines for reviews to ensure that they are conducted in a manner that makes efficient use of the Assessment Author's time, provides an open forum for comment, leads to improvements in the quality of the assessment, and does not detract from the stock assessment and review process. A draft guideline follows.

Guideline for Groundfish Assessments

Notification:

If members of the public wish for comments of an external reviewer to be considered in the upcoming assessment cycle, they should notify NMFS and the NPFMC of their intent to formally review an assessment no later than the April NPFMC meeting. If multiple groups plan to assess the same assessment, the AFSC and the NPFMC should work with the groups to coordinate meetings and requests for materials to ensure the most efficient use of the Assessment Author's time.

Timing:

External reviews of groundfish assessments should occur prior to the peak AFSC Staff assessment period July – December. Ideally, the reviewer will work with Assessment Authors in a collegial setting where reviewers would make suggestions to the framework or information used in the assessment. If this procedure is adopted, the Assessment Author would work with the reviewer(s) to find a mutually acceptable time for a pre-assessment workshop.

Responsibilities of External Reviewers and Assessment Authors:

The pre-assessment workshop (this implies a formal meeting – is this the intention?) will allow the reviewer to discuss the stock assessment with the Assessment Author and make requests for model modifications or alternative use of information in the assessment. The External Reviewer should produce a written report of their recommendations. To the extent practicable, the Assessment Author will address the comments and suggestions documented in the External Reviewer's report in their SAFE document. In general it is assumed that the Assessment Author will be able to determine whether any changes in the stock assessment recommended by the External Reviewer are substantial enough to require review by the Plan Teams and SSC. Assessment Authors will have the professional discretion to decide when the External Reviewer's recommendations will be incorporated into the SAFE document. When the External Reviewer's recommendation involves a matter of professional discretion, such as the choice of statistical or computational methods, Assessment Authors will have the ability to decline to implement the recommendation. In addition, Assessment Authors may defer action on an External Reviewer's recommendation when complying with the recommendation would compromise the SAFE schedule. For example, if an External Reviewer made a request that would require extensive re-analysis of existing data that could not be accomplished prior to the September Plan Team meeting, that request could be deferred to a subsequent year.

In cases where a recommendation is not brought forward in the assessment, Assessment Authors will inform the reviewer of his or her rationale for not acting on the recommendation three weeks prior to the September Plan Team meeting. The External Reviewer can inform the Plan Team and the SSC of the rationale for their recommendation by submitting a report in September. The report should contain sufficient information to allow the Plan Team and SSC to fully review the recommendation. The SSC will determine whether the recommendation should be advanced for consideration.

Attachment 1. A Guide to the Preparation of Alaska Groundfish SAFE Report Chapters

Alaska Fisheries Science Center

June 2003

Introduction

The BSAI and GOA Groundfish FMPs require that separate drafts of the SAFE reports be produced each year in time for the October and December meetings of the North Pacific Fishery Management Council. These drafts are assembled at meetings of the Groundfish Plan Teams held in September and November.

To ensure adequate time for internal review of stock assessments, a pair of due dates will be established annually. These due dates typically will precede the respective Plan Team meetings by three to four weeks.

The following guidelines govern the preparation of individual stock assessment chapters for the two drafts.

Guidelines Pertaining to the September SAFE Report

It is not always necessary to produce a chapter for the September SAFE report. In general, it is assumed that authors will be able to discern whether any changes in the stock assessment resulting from incorporation of the available new information are substantial enough to require review by the Plan Teams and SSC. Authors are strongly encouraged to collect and analyze new information prior to the relevant due date to ensure that the implications of such information are thoroughly evaluated.

A chapter should be produced for the September SAFE report if new implementation software is used, or if the stock assessment model has been changed substantively. For the latter, an example might be when one or more parameters presented in the "Parameters Estimated Independently" subsection have been estimated for the first time or re-estimated since the previous assessment.

A chapter may not be necessary for the September SAFE report if the above does not apply and if no new information is available or if preliminary analyses of new information fail to indicate any substantial changes from the previous assessment.

If a stock is already being managed under Tiers 1-3 and a chapter is produced for the September SAFE report, the chapter should include enough information to allow a thorough evaluation of changes in data, software, or model structure, except that the implications of such changes for next year's ABC should not be addressed. Production of a complete chapter (see "Outline of SAFE Report Chapters" below) is not necessary under these circumstances.

If a stock is not already being managed under Tiers 1-3 and a chapter is produced for the September SAFE report, the chapter should include all sections listed in the "Outline of SAFE Report Chapters" below, except that the last item in the "Projections and Harvest Alternatives" section ("Recommendation of FABC and ABC for coming year") should be omitted.

In all cases, careful consideration should be given to all applicable SSC comments from the previous assessment(s). Chapters should be submitted by the relevant due date. Please have a running header (i.e., on each page) in the document submitted to the Plan Team that reads: "September Plan Team Draft" and the date of draft document (in case it changes during the meeting).

Note: As you find ways to improve our assessment presentations and these guidelines, please don't hesitate to contact [Anne](#) or [Jim](#)...

Guidelines Pertaining to the November SAFE Report

A chapter should be produced for the November SAFE report in all cases, and should include all sections listed in the "Outline of SAFE Report Chapters" below. The Outline is intended to provide a consistent structure and logical flow for stock assessments conducted at the Alaska Fisheries Science Center for the groundfish fisheries of the BSAI and GOA. Some variation from this outline is permissible if warranted by limitations of data or other extenuating circumstance. However, it is particularly important that all of the items listed under "Projections and Harvest Alternatives" be included to the maximum extent possible, in that many of these are critical to the fishery management process. Careful consideration should be given to all applicable SSC comments from the previous assessment(s). Chapters should be submitted by the relevant due date. Please have a running header (i.e., on each page) in the document submitted to the Plan Team that reads: "November Plan Team Draft" and the date of draft document (in case it changes during the meeting).

Outline of SAFE Report Chapters

Executive Summary

Summary of Major Changes

Changes (if any) in the input data

Changes (if any) in the assessment methodology

Changes (if any) in the assessment results, including projected biomass, ABC, and OFL

Responses to SSC Comments

Responses to SSC comments specific to this assessment (for each comment that is addressed in the main text, list comment and give name of section where it is discussed; if the SSC did not make any comments specific to this assessment, say so)

Responses to SSC comments on assessments in general (for each comment that is addressed in the main text, list comment and give name of section where it is discussed; if the SSC did not make any comments on assessments in general, say so)

Introduction

Scientific name

Description of general distribution

Description of management unit(s) (be sure to include any spatial and/or seasonal management measures).

Evidence of stock structure, if any

Description of life history characteristics relevant to stock assessments (e.g., special features of reproductive biology)

Fishery

- Description of the directed fishery
- Information on bycatch and discards
- Summary of historical catch distributions

Table showing time series of ABC, TAC, and total catch; accompanied by a list of recent relevant management or assessment changes that have influenced choice of ABC; selectivity of commercial fishing gear; or distribution of catch by gear, area, or season (e.g., changes in mesh size, gear allocations, harvest strategy, or modeling approach)

Data (Items in this section should be presented in tabular form.)

Data which should be presented as time series (starting with 1977):

- Total catch, partitioned by strata used in the assessment model, if any
- Catch at age or catch at length, as appropriate
- Survey biomass estimates
- Survey numbers at age or numbers at length, as appropriate
- Other time series data (e.g., predator abundance, fishing effort)
- Sample sizes (e.g., numbers of age or length samples by year, gear, and area)

Data which may be aggregated over time:

- Length at age
- Weight at length or weight at age

Analytic Approach

Model Structure

Description of overall modeling approach (e.g., age/size structured versus biomass dynamic, maximum likelihood versus Bayesian)

Reference for software used (e.g., Synthesis, AD Model Builder)

Description of, or reference for, population dynamic representations used in the model (e.g., Baranov catch equation, Brody length-at-age equation)

Discussion of changes in any of the above since the previous assessment

Parameters Estimated Independently

List of parameters that are estimated independently of others (e.g., the natural mortality rate, parameters governing the maturity schedule)

Description of how these parameters are estimated (methods do not necessarily have to be statistical; e.g., M could be estimated by referencing a previously published value)

Parameters Estimated Conditionally

List of parameters that are estimated conditionally on those described above (e.g., full-selection fishing mortality rates, parameters governing the selectivity schedule)

Description of how these parameters are estimated (e.g., error structures assumed, list of likelihood components)

Model Evaluation

Description of alternative models, if any (e.g., alternative M values or likelihood weights)

Description of criteria used to evaluate the model or to choose between alternative models, including the role (if any) of uncertainty

Evaluation of the model, if only one model is presented; or evaluation of alternative models and selection of final model, if more than one model is presented

List of final parameter estimates, with confidence intervals or other statistical measures of uncertainty if possible (if the set of parameters includes quantities listed in the “Results” section below, the values of these quantities should be presented in the “Results” section rather than here)

Schedules, if any, defined by final parameter estimates

Results

Definition of biomass measures used (e.g., biomass at ages 3 and above)

Definition of recruitment measures used (e.g., numbers at age 3)

Definition of fishing mortality measures used (e.g., full-recruitment F multiplied by average selectivity for ages 3 and above)

Table of estimated biomass time series (starting with 1977), including spawning biomass as one measure, with confidence bounds or other statistical measure of uncertainty if possible. Include estimates from previous SAFE for retrospective comparisons

Table of estimated recruitment time series (starting with 1977), including average, with confidence bounds or other statistical measure of uncertainty if possible. Include estimates from previous SAFE for retrospective comparisons

Table of estimated catch/biomass time series (starting with 1977), with confidence bounds or other statistical measure of uncertainty if possible.

Graph of estimated biomass time series, with confidence bounds if possible

Include a graph of the estimated fishing mortality versus estimated spawning stock biomass, including applicable OFL and maximum F_{ABC} definitions for the stock. The rationale is that graphs of this type are useful to evaluate management performance.

Projections and Harvest Alternatives

List of parameter and stock size estimates (or best available proxies thereof) required by limit and target control rules specified in the fishery management plan

Specification of FOFL, OFL, the upper bound on F_{ABC} , and other applicable measures (if any) relevant to determining whether the stock is overfished

List of standard harvest scenarios and description of projection methodology

Table of 12-year projected catches corresponding to the alternative harvest scenarios, using stochastic methods if possible (mean values or other statistics may be shown in the case of stochastic recruitment scenarios)

Table of 12-year 5-year (or 10-year, if the stock is overfished) projected spawning biomass corresponding to the alternative harvest scenarios, using stochastic methods if possible (mean values or other statistics may be shown in the case of stochastic recruitment scenarios)

Table of 12-year projected fishing mortality rates corresponding to the alternative harvest scenarios, using stochastic methods if possible (mean values or other statistics may be shown in the case of stochastic recruitment scenarios)

Discussion of information, if any, that might warrant setting ABC below the upper bound

Recommendation of F_{ABC} and ABC for 2-year specification cycle.

Include a subsection titled “Area Allocation of Harvests” and provide results and details of any apportionment schemes that are used.

Ecosystem Considerations

Discussion of any ecosystem considerations (e.g., relationships with species listed under the ESA, prohibited species concerns, bycatch issues, refuge areas, and gear considerations).

The following subsections should provide information on how various ecosystem factors might be influencing their stock or how the specific stock fishery might be affecting the ecosystem and what data gaps might exist that prevent assessing certain effects.

Stock assessment authors would be encouraged to rely on information in the Ecosystem Considerations chapter to assist them in developing stock-specific analysis and recommending new information to the Ecosystem Considerations chapter that might be required in future years to improve the analysis. Time-series that are in the Ecosystem Chapter would be referred to by the author and not duplicated in their chapter. In cases where the authors have time series or relationships that are specific to their stock, that information should be in their assessment chapter and not in the Ecosystem chapter.

Ecosystem Effects on Stock

There are several factors that should be considered for each stock in this subsection. These include:

- 1) Prey availability/abundance trends (historically and in the present and foreseeable future). These prey trends could affect growth or survival of a target stock.
- 2) Predator population trends (historically and in the present and foreseeable future). These trends could affect stock mortality rates over time.
- 3) Changes in habitat quality (historically and in the present and foreseeable future). These would primarily be changes in the physical environment such as temperature, currents, or ice distribution that could affect stock migration and distribution patterns, recruitment success, or direct effects of temperature on growth.

Fishery Effects on the Ecosystem

In this section the following factors should be considered:

- 1) Fishery-specific contribution to bycatch of prohibited species, forage (including herring and juvenile pollock), HAPC biota (in particular, species common to *YourFishery*), marine mammals and birds, and other sensitive non-target species (including top predators such as sharks, expressed as a percentage of the total bycatch of that category of bycatch).
- 2) Fishery-specific concentration of target catch in space and time relative to predator needs in space and time (if known) and relative to spawning components.
- 3) Fishery-specific effects on amount of large size target fish.
- 4) Fishery-specific contribution to discards and offal production.
- 5) Fishery-specific effects on age-at-maturity and fecundity of the target species.
- 6) Fishery-specific effects on EFH non-living substrate (using gear specific fishing effort as a proxy for amount of possible substrate disturbance).

Authors should consider summarizing the results of these analyses into a table as shown below (for example):

Analysis of ecosystem considerations for *YourStock* and the *YourFishery*. The observation column should summarize the past, present, and foreseeable future trends. The interpretation column should provide details on how the trend affects the stock (ecosystem effects on the stock) or how the fishery trend affects the ecosystem (fishery effects on the ecosystem). The evaluation column should indicate whether the trend is of: *no concern, probably no concern, possible concern, definite concern, or unknown.*

Ecosystem effects on *YourStock*

Indicator	Observation	Interpretation	Evaluation
<i>Prey availability or abundance trends</i>			
Zooplankton	Stomach contents, ichthyoplankton surveys, changes mean wt-at-age	Stable, data limited	Unknown
<i>Predator population trends</i>			
Marine mammals	Fur seals declining, Steller sea lions increasing slightly	Possibly lower mortality on pollock	No concern
Birds	Stable, some increasing some decreasing	Affects young-of-year mortality	Probably no concern
Fish (Pollock, Pacific cod, halibut)	Stable to increasing	Possible increases to pollock mortality	
<i>Changes in habitat quality</i>			
Temperature regime	Cold years pollock distribution towards NW on average	Likely to affect surveyed stock	No concern (dealt with in model)
Winter-spring environmental conditions	Affects pre-recruit survival	Probably a number of factors	Causes natural variability
Production	Fairly stable nutrient flow from upwelled BS Basin	Inter-annual variability low	No concern

***YourFishery* effects on ecosystem**

Indicator	Observation	Interpretation	Evaluation
<i>Fishery contribution to bycatch</i>			
Prohibited species	Stable, heavily monitored	Minor contribution to mortality	No concern
Forage (including herring, Atka mackerel, cod, and pollock)	Stable, heavily monitored	Bycatch levels small relative to forage biomass	No concern
HAPC biota	Low bycatch levels of (spp)	Bycatch levels small relative to HAPC biota	No concern
Marine mammals and birds	Very minor direct-take	Safe	No concern
Sensitive non-target species	Likely minor impact	Data limited, likely to be safe	No concern
<i>Fishery concentration in space and time</i>	Generally more diffuse	Mixed potential impact (fur seals vs Steller sea lions)	Possible concern
<i>Fishery effects on amount of large size target fish</i>	Depends on highly variable year-class strength	Natural fluctuation	Probably no concern
<i>Fishery contribution to discards and offal production</i>	Decreasing	Improving, but data limited	Possible concern
<i>Fishery effects on age-at-maturity and fecundity</i>	New study initiated in 2002	NA	Possible concern

Data gaps and research priorities

Summary

Table showing M, *Tier (previous year or recommended)*, projected *total biomass (give age range)*, and *female spawning* biomass for next year, *equilibrium female spawning biomass values for B100%, B40%, B35% and B₀ (if available from stock-recruit relationship)*, FOFL , the maximum allowable value for FABC , the recommended value for FABC , OFL, *the maximum allowable ABC*, and recommended ABC.

Literature Cited

This is the format for literature cited section (Note that the LC is selected in the style box above)