Minutes of the Joint Plan Teams for the Groundfish Fisheries of the Gulf of Alaska (GOA) and Bering Sea Aleutian Islands (BSAI)

North Pacific Fishery Management Council
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November 14 - 18th, 2016

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Administrative

Introductions: The Joint meeting of the Gulf of Alaska (GOA) and Bering Sea Aleutian Islands (BSAI) Groundfish Plan Teams ("Teams") convened Monday November 16, 2015 at 9:00AM at the Alaska Fisheries Science Center in Seattle, Washington. Introductions were made. The Joint, BSAI, and GOA Groundfish Teams adopted a revised agenda. The agenda is available at: http://www.npfmc.org/wp-content/PDFdocuments/membership/PlanTeam/Groundfish/GFPTagenda_Nov2016.pdf

Documents and presentations: All non-assessment documents provided prior to or during the meeting as well as presentations given during the meeting were posted to the Council's Granicus site . All assessments are posted to the Team draft assessments site.

Procedures for writing minutes: The Teams reviewed the draft procedures for writing minutes (document posted to Granicus agenda) and discussed standardization for editing and finalizing minutes on discussions and recommendations to analysts.

Assessment prioritization meeting: The Teams reviewed a draft agenda and objectives (attached) for the January 2017 two-day proposed Team meeting to address assessment prioritization for North Pacific groundfish stocks. A survey will be submitted to authors and Team members to assess potential

modifications from status quo and scenario 4 in order for the working group to compile additional information prior to the January meeting.

Meeting planning 2017: The Teams discussed timing of 2017 Team meetings. The agreed upon dates are as follows (all meetings will be at the AFSC in Seattle, WA):

Jan 11-12, 2017	Stock Assessment Prioritization Workshop
Sept 12-15, 2017	September Team Meeting
Nov 13-17, 2017	November Team Meeting

Essential Fish Habitat Update: The Teams designated a subcommittee as needed to provide feedback on EFH analysis prior to the April Council meeting. Council staff will evaluate to what extent this meets the Council's intent for Team input following the December Council meeting and update the Teams as to future planning for EFH input.

NMFS Visiting scientist exchange overview

Patrick Lynch discussed a national program for capacity building in specific topics through training workshops and scientist exchanges. For example, Jim Thorson will be conducting a workshop on geostatistical modeling and another region is planning for more work on data-limited methods. The Teams were pleased to hear of this activity and suggested collaborating on similar projects (e.g., data limited applications and improved stock assessment document compilation methods).

Halibut DMR update

Jim Armstrong presented the updated working group report on proposed Pacific halibut discard mortality rates (DMRs). He noted that the Council will be addressing this topic at the December 2016 meeting to adopt DMRs for 2017 and 2018, but they are also likely to be re-specified for 2018.

The previous approach for DMRs has been in place for many years, is stratified by a target fishery, and uses an average over the previous ten-year period. The proposed approach is designed to be consistent with the observer sampling design and to be consistent with operational causes of variation in DMRs. A review, being done by IPHC, of the experimental basis of DMRs associated with halibut viability categories, is likely to be included in the 2016 Report of Assessment and Research Activities (RARA) published by IPHC. The status of this review is not known, but it may be useful to identify where improvements could be made.

Some operational groupings contained some years with inadequate samples. Many times, these cases were for groupings that had an assumed DMR, such as pelagic trawls where the time out of water is long enough that 100% mortality is assumed. DMRs have been estimated for hook-and-line catcher vessels only in recent years since they have only recently been carrying observers. Pot fisheries did not have issues with very small sample sizes.

One constraint identified in the September Working Group report was that Rockfish Program catcher vessels using non-pelagic trawls were difficult to identify in the viability datasets. Therefore, the Working Group recommended using DMRs from the target fishery grouping (status quo approach adapted to updated estimation methods). The Working Group will attempt to resolve direct estimation of DMRs for this operational group during 2017.

A table of DMRs for specification was provided, and estimated total mortality for 2015 was compared to the previous total mortality. Changes to total mortality were small, and below PSC limits for all fisheries except for the GOA hook-and-line CV fleet.

The Working Group will provide ongoing feedback to the observer program regarding the number of viability samples.

The interaction between the Council and the Working Group was discussed. The task of the Working Group is to provide more accurate DMRs, but improvements in the future may involve calculating vessel-specific DMRs, among other possibilities. The Teams concurred that the estimates are appropriate given the data collection program. Size is recorded by observers and it was noted that halibut size could be explored as an additional factor in DMR estimation.

Some operational changes, such as deck sorting, that some industry sectors are beginning to practice were identified that would likely have a big effect on DMRs. Additionally, targeting smaller catches to reduce processing time is being practiced by some sectors depending on target species. There is a concern that the proposed operational categories may not provide adequate incentives for better handling practices because the operational categories do not account for additional differences in handling. It may be useful to further split some operational categories into sub-categories reflecting different handling practices (e.g., short vs long tows). It was also noted that decisions to sub-categorize may be better informed if the variance of the DMR was calculated for each operational category.

A discussion about data availability identified that some viability data are unavailable because there is inadequate access to the discarded fish.

Vessels operating under an Exempted Fishing Permit (EFP) for deck sorting are not included in the data analyzed by the Working Group. These boats are getting credit for better handling under the EFP, but it would require a Council process for their experimental program to be put into regulation.

The three year reference period for averaging annual DMRs was chosen due to the observer program design restructure in 2013, but also to provide an incentive to improve DMRs. It was asked if an even shorter period to average DMRs would provide more incentive for the larger volume fisheries (like the Amendment 80 fleet). The analyst suggested that the working group could begin to evaluate policy issues such as incentives, but would do so at the direction of the Council.

The catch accounting system was discussed and it is not planned to retrospectively update the historical catches with updated DMRs. The IPHC uses different numbers for in-season management, and it may be useful to compare their estimates to the catch accounting system results.

The Teams recommend that the workgroup evaluate operational constraints on halibut availability for viability determination and communicate findings to the observer program to re-prioritize sampling (if needed).

The Teams see this work as an improvement to previous methods for estimating Pacific halibut DMRs and recommend using the reported results of the updated methods for specification of DMRs in 2017-2018.

If there are further modifications to the methodology and DMRs for 2018, the Teams recommend being involved in reviewing results before they are adopted.

Halibut Report card

Diana Stram provided an overview of the Council's request from December 2015 for the Team, AFSC, and IPHC to develop ecosystem indicators for BSAI and GOA halibut for inclusion in the Ecosystem Considerations chapter in the SAFE report. Since that time, a group of analysts from each agency have met to develop approaches for assessing this request and are looking for feedback from the Teams and the Council on moving forward.

Allan Hicks provided an overview from IPHC staff on their plans to provide annual summaries of the halibut population and their initial consideration of potential indicators that may be useful for developing a halibut-specific ecosystem report card. The IPHC noted that any halibut assessment information may be lagged one year, given the availability of assessment results; however, other trend data may be best presented regionally (e.g., BSAI and GOA trawl survey data when available). The IPHC summary under development could help inform some of the annual indicators for inclusion in the ecosystem SAFE document. The group has discussed the potential for developing a report card along the lines of the SPEC being drafted for individual stock assessments (per draft sablefish SPEC under development as presented to the Teams in September).

The Teams agree with the approach outlined, including consideration and incorporation of the IPHC summary indicators (once available), to avoid duplicative efforts.

The Teams recommend that the subgroup continue to work to develop an ecosystem report card for halibut as indicated in the draft report, for presentation in September 2017.

Grenadiers

Jon Heifetz presented the grenadier abbreviated assessment. Because grenadiers are part of the Ecosystem Component, a stock assessment is not required and there is no ABC or OFL. An abbreviated SAFE report was prepared in 2014 for the BSAI and GOA combined, for the purpose of tracking trends in abundance and catch. In 2014 the SSC and Teams agreed that an abbreviated assessment should be produced in even years for both regions.

This year's abbreviated assessment updated catch in both FMPs through October 2016, updated the survey biomass estimates for the Aleutian Islands (AI) and eastern Bering Sea (EBS) slope trawl surveys through 2016 and the Gulf of Alaska (GOA) trawl survey through 2015, and updated the AFSC longline survey RPNs through 2016. There were no changes to the assessment methodology from the previous abbreviated assessment presented in 2014.

For 2016, the maximum allowable ABC would be 70,031 mt for the BSAI and 29,711 mt for the GOA. These values constitute a 7% decrease for the BSAI and a 3% decrease for the GOA. Catch has been well below the ABCs in both FMPs. Biomass estimates in the AI and EBS appear be stable, while the GOA biomass increased through 2005 and has been relatively stable since. The GOA biomass was estimated using the random effects model. The AI biomass is based on the AI trawl survey biomass, plus an estimated biomass for depths exceeding the trawl survey using longline survey data, and is averaged over the last three surveys. The EBS biomass is the EBS slope survey biomass averaged over the last three biomass surveys.

The Teams accepted the authors' recommended ABCs and OFLs, which are not management quantities, but used for monitoring only. They also agree that assessment of this stock complex should continue with the abbreviated assessments in even years and that it be presented to the Joint Teams

The Teams recommend that the analysts use the random effects model for the AI and EBS areas as a survey averaging approach.

Economic Status report

Ben Fissel and Steve Kasperski gave a presentation of the Economic SAFE report, supplementing a report given in September. There are several significant new additions to the 2016 ec--onomic SAFE report including a new section on the Economic Data Report (EDR) for Amendment 91, which manages Chinook salmon bycatch in the BSAI AFA pollock fishery, including skipper survey and fuel usage in the fishery from 2012-2015. The SAFE section on fishing communities has been revised and the SAFE includes a comprehensive set of wholesale price projections at the product-form and species level. Plans for future changes to the economic SAFE include a restructuring of data tables, probably with separate sections for the BSAI and GOA, depending on feedback from the SSC.

Economic Performance Reports (EPR) were completed for 6 stocks (4 more are planned) and incorporated into the relevant stock assessment documents. The format for including these reports was not standardized across stock assessment documents. Some authors included the EPR as an appendix, while others placed it next to the ecosystem considerations section or incorporated the EPR in another section. The Teams discussed the best way to incorporate the economic information, and in particular, whether it was desirable to standardize across assessments. The Teams agreed to experiment this year and next year and lead reviewers of each stock assessment chapter with an EPR will comment on its placement.

A first version of an economic report card with 9 items was created: 1) real first-wholesale revenue index, 2) real first-wholesale index, 3) real effective exchange rate index (i.e., An average of foreign currencies to U.S. dollar exchange rate weighted by fisheries exports), 4) the effective global share of Alaska pollock and cod catch volume (i.e., the average shares of global catch weighted by AK first-wholesale revenue shares), 5) production volume divided by total catch, 6) ratio of ex-vessel over wholesale revenues, 7) Alaska resident share of shoreside ex-vessel value, 8) share of shoreside value for the top 5 ports, and 9) real first wholesale revenue per fishing week (a form of revenue per unit effort). Real revenues in recent years are relatively high due to catch and production levels, while prices are relatively low. High global pollock and cod production and exchange rates have put downward pressure on prices in recent years. Globally, Alaska has a significant effective share of pollock and cod (approximately 40%). In recent years, the ratio of ex-vessel to wholesale revenues is close to the long run average, and revenue per unit effort has been fairly high. Likewise, Alaska residents share of shoreside revenues has been relatively high in recent years compared to the early 2000s (the higher share recently is due to cod), and these revenues have been concentrated in a few ports.

The Teams commend the additions made to the Economics SAFE this year and to specific stock assessment chapters. A Team member noted that when the consistency of the Ecosystem Considerations sections across assessments is evaluated, this would also present an opportunity to consider the integration and consistency of economic elements. One Team member mentioned that they like the inclusion of some economic information in the Ecosystem Chapter because it stresses the social-ecological systems (SES) concept, although this is different information than is in the Economics SAFE or the Economic Performance Reports.

The Teams recommend that the ESSRP continue to add socioeconomic information and to revisit the standardization of the placement of economic information in the stock assessment chapters at the September 2017 Team meeting.

Sablefish

Dana Hanselman presented the assessment overview and briefly covered topics related to the CIE review that occurred in 2016 and were addressed in the September Team meeting. The main areas of concern for the short term were "gaining imprecision," incorporating whale depredation, and showing structural uncertainty. Longer term topics were developing a tag-integrated model, estimating growth inside the model, considering Canadian catches, and finishing the fishery CPUE index. Dana considered the model modifications as being substantial relative to the 2010 model version and therefore adopted the following numbering convention for the eight candidate models that were presented:

Model	Description
10.3	This is the model used from 2010-2015
10.3a	Model 10.3 with the revision of area sizes used to calculate the domestic longline survey abundance index
10.3b	Model 10.3a with the inclusion of analytical annual variance calculations for the domestic longline survey abundance index
16.1	Model 10.3b with domestic longline survey abundance index corrected for sperm whale depredation
16.2	Model 10.3b with additional catch mortality from both sperm and killer whales
16.3	Model 16.1 with additional catch mortality from both sperm and killer whales
16.4	Model 16.3 reweighted so that the SDNR of the domestic longline survey abundance index equals 1
16.5	Model 16.4 with natural mortality estimated with a prior CV of 10%

Model 10.3a used GIS to calculate area sizes, including an updated bathymetry layer in each area and calculated area sizes for 150-200 m depths. Most changes were small and mostly increased the area of shallow waters. Model 10.3b added variance estimates to the longline survey that were analytical rather than a time-invariant CV of 5% based on bootstrapping. The new estimates are based on station-stratum combinations including a covariance between the depth and stratum means.

Models 16.1-16.5 addressed whale depredation. Model 16.1 dealt with the longline survey abundance index where both whale presence and evidence were examined as covariates affecting sablefish CPUE. Results show that CPUE was reduced by 12% when the factor "evidence" of whale depredation was included. Model 16.2 estimated whale depredation effects in the commercial fishery. It was noted there are issues with the observer data resulting from coverage and reporting marine mammal interactions. Killer whales dominate in the BSAI and western GOA while sperm whales are an issue in the central and eastern GOA. A number of models were compared and a GAMM model with included random effects was selected to estimate whale depredation. Estimated CPUE reduction for killer whales ranged from about 45% to 70% and sperm whales were estimated to reduce CPUE from 23% to 30%. These estimates were applied to the catch using a zero-inflated Poisson GAM to model the number of sets depredated by area. The resulting reduction in catch ranges from 200 t to 800 t with an average of approximately 400 t. Model 16.3 combines the depredation effects for the survey and the fishery from 16.1 and 16.2. Putting them together results in a larger impact on the estimated female spawning biomass, with a ratio of corrected to uncorrected of about 1.06. Model 16.4 tunes down the longline survey abundance index

to gain imprecision. This was accomplished by tuning to the standard deviation of the normalized residuals (SDNR) to 1 for the longline survey index while maintaining the other tuned quantities at SDNR = 1. Model 16.5 estimates natural mortality (M) inside the model. Maturity was not estimated in the model at this time.

New data included in the assessment included:

- catch - updated catch for 2015, new estimated catch for 2016-2018,
- relative abundance - 2016 longline survey and the 2015 longline fishery,
- ages - 2015 longline survey and the 2015 fixed gear fishery,
- lengths - 2016 longline survey, 2015 fixed gear fishery, and the 2015 trawl fishery, and
- new economic performance report (in Appendix).

Catch has been declining in recent years but the price is expected to increase in the near future. For relative abundance, the 2016 domestic RPN increased 28% compared to 2015; the 2015 fishery RPW was down 13% from 2014, and 2015 GOA trawl survey was up 12% relative to 2013. The 2016 longline survey sperm whale depredation was slightly lower and the killer whale depredation was much reduced. Male and female length frequency plots show a notable bump at ~50 cm which may be a mixture of 2013 and 2014 year classes. Similar to 2014 and 2015 there are anecdotal reports of many YOY sablefish in coho stomachs and surface trawls in the GOA for 2016. The IPHC survey for 2015 showed an increase in sablefish numbers inshore relative to 2014, especially in the central and eastern GOA. The longline survey RPNs were up across the board from the BSAI to the eastern GOA. The model fit to this data continues to show a steady decrease in the RPN for 2016 despite an increase in survey abundance. Overall, fits from model 16.5 are better but not substantially different. Fits to the survey ages and lengths seem to be underestimating the abundance younger fish and overestimating the numbers of larger fish. Fishery CPUE from the observer and logbook programs were down for all areas except the Aleutian Islands and western Yakutat. Model estimates of the fishery RPWs track the observed decline but overestimate the index for the last seven years. Model fits to the survey ages are similar to survey ages.

Model evaluation criteria included goodness of fit, parsimony, and biological plausibility of results. Following the CIE review, the authors also conducted retrospective analysis, considered propagation of uncertainty (imprecision), and accounted for whales in the model. Model 16.5 performed best in retrospective though recruitment did not change much. M was estimated at 0.097 which is not a large departure from the previous value of 0.100. Tuning the SDNRs and estimating *M* resulted in CVs nearly two times larger, particularly for the preferred model 16.5. Retrospective trends were examined using multiple measures which when averaged, resulted in model 16.5 being best overall.

In summary, Model 16.5 resulted in less precise estimates, accounted for whale depredation in the survey and fishery, and fit the data reasonably well. Above-average year classes were estimated for 1997, 2000, 2008, and possibly 2013.However, the spawning biomass is estimated to continue declining and be at about 35% of unfished in 2017.

Dana noted that future work will include: reconsideration of estimating growth in the model, modeling the fishery CPUE index, more work on maturity, continued investigation of recruitment processes (GOAIERP), changes to the Species Profile and Ecosystem Considerations section (SPEC), and incorporation of the economic performance report into the main text (possibly in conjunction with the SPEC)

Autocorrelation in residuals of the main indices was discussed and asked if covered in the CIE review (the response was negative). The possibility that the relatively poor pattern of residuals may somehow

account for good performance (in terms of retrospective analyses) was raised. The idea here being that retrospective patterns may occur in response to periods of outlier-type survey estimates.

The Teams recommended examining ways in which residual patterns can be more objectively considered as part of the data weighting exercise.

It was noted that using SDNRs for composition data is less than ideal because it fails to take into account the autocorrelation aspects of the multinomial distribution.

The main differences between Models 16.5 and 16.4 are a small change in M and increased uncertainty, but neither of these appear to affect ABC/OFL recommendations appreciably. If the Tier 3 harvest control rules are revised to incorporate uncertainty explicitly, this could be useful. Dana noted that Model 16.5 includes expanded structural uncertainty of the model which was in response to the CIE review.

The Team discussed model selection and the whale depredation adjustment. Whale depredation may occur and would be "accounted for" in the natural mortality estimate. Whale depredation would be zero under no-fishing so is specified as a component of fishing mortality. It was also noted that if the fishery began avoiding areas with high depredation, it should be reflected in the 3-yr average of area-specific depredation for killer and sperm whales. Is it possible to improve upon assuming the same selectivity for whales and the fishery (for example, whales selecting bigger fish)? More could be done with, for example, stock assessments for whale populations. It appears that the group of whales involved in depredation is consistent over time (i.e., depredation is learned behavior). There was general concern about how changes in observer coverage will affect whale depredation estimates.

There were no changes to apportionment methods; the model ABC, continuing with the fixed apportionment from the 2016 fishery, were used. The Teams discussed how this approach reflects the general objective of spreading fishing effort given lack of understanding about spawning location and movement behavior.

The Team accepted the recommended model (16.5), which included whale depredation effects on both the main survey index and the ABC. It was noted that by including the expected extent of whale depredation the ABC was lower than the maximum permissible value.

Draft Objectives for Joint Plan Team stock prioritization review

Draft 2, 11/3/16

AFSC Seattle

January 11-12, 2017 [2 days]

Objective: provide Joint Groundfish Plan Team recommendations on NPFMC stock prioritization results. Specifically:

1. evaluate the results of the prioritization process applied to N. Pacific groundfish;
2. develop a proposal for how to use those results to support planning;
3. discuss any recommended changes from status quo and whether those changes are supported/justified;
4. and for any proposed changes, discuss the implications, and where assessments may occur at lower frequency, discuss potential interim actions to support mgmt.

Agenda:

1) Results of scenarios and discuss process of incorporating Council feedback.
    a. Working from Scenario 4 (or other scenario) results discuss pros and cons of the recommended assessment cycle on a stock-by-stock basis.
    b. Create a list of factors that might shift the prioritization for different species.
    c. Develop a proposed assessment frequency and justification for all BSAI and GOA stocks
    d. If no changes to assessment frequency discuss how results of prioritization can be used to guide future assessment reviews (i.e. CIE or otherwise)
    e. Develop several options for how the Plan Team process will be combined with Council input to make final prioritization recommendations.
2) Off-cycle assessment options or plans
    a. List of potential options for off-cycle assessments and pros/cons of each. End result is a recommended approach for off-cycle assessments (either statu7s quo or modified)
3) Implications of lag time between assessments.
    a. choke species
    b. stock status issues
    c. climate and forecasting issues on stock status
    d. management response to uncertainty
    e. trade-offs for assessment scientists