Minutes

Joint Plan Teams for the Groundfish Fisheries of the Bering Sea Aleutian Islands and Gulf of Alaska

September 10 - 11, 2013

North Pacific Fishery Management Council
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Anchorage, AK 99501

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Dana Hanselman	AFSC ABL	Craig Faunce	AFSC FMA
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Introduction

The Joint meeting of the Gulf of Alaska (GOA) and Bering Sea Aleutian Islands (BSAI) Groundfish Plan Teams convened Tuesday September 10, 2012 at 9:00 am at the Alaska Fisheries Science Center in Seattle, Washington. Introductions were made. New Plan Team members were welcomed (Jan Rumble and Obren Davis on the GOA Plan Team and Liz Chilton on the BSAI Team, who was absent due to illness). The Joint Groundfish Plan Teams adopted a revised agenda.

Council Actions

The Teams received updates on the following Council actions from Jane DiCosimo, Melanie Brown, and Scott Miller.

Halibut PSC limits NMFS published a notice of availability of Amendment 95 to the GOA Groundfish FMP which would: establish halibut prohibited species catch (PSC) limits for the GOA; reduce the GOA halibut PSC limits for trawl and hook- and-line gear; reduce trawl halibut PSC sideboard limits for American Fisheries Act, Amendment 80, and Central GOA Rockfish Program vessels; and provide two additional management measures associated with halibut PSC accounting for Amendment 80 vessels

subject to halibut PSC sideboards and for halibut PSC made by trawl vessels. The comment period will open soon and run through October 28, 2013.

BSAI flatfish harvest specifications The Council adopted BSAI Groundfish FMP Amendment 105 to allocate the ABC reserve (generally, the difference between acceptable biological catch (ABC) and total allowable catch (TAC)) for flathead sole, rock sole, and/or yellowfin sole, among the Amendment 80 cooperatives and CDQ groups, using the same formulas that are used in the annual harvest specifications process. These industry groups would be able to exchange their flathead sole, rock sole, or yellowfin sole quota share for an equivalent amount of their allocation of the ABC reserve for these three species. The number of exchanges that each entity can make would be limited to three per calendar year. Development of rulemaking is underway.

Supplemental Information Report for Groundfish Programmatic SEIS The Council and NMFS are developing a Supplemental Information Report (SIR) for the 2004 Groundfish Programmatic SEIS. The purpose of the SIR is to evaluate comprehensively whether the PSEIS needs to be supplemented with a new EIS. AFSC experts have reviewed the conclusions in the 2004 EIS to determine whether, based on new information, a new analysis would reach a different conclusion as to the impacts of the groundfish fisheries. Council and NMFS staffs are compiling the information for a draft SIR which is scheduled to be presented to the Council in December 2013. The Council then will decide whether to initiate a new or revised PSEIS.

Steller sea lion protection measures The U.S. District Court ordered NMFS to prepare an EIS by March 2, 2014, on the BSAI Steller sea lion protection measures for the groundfish fisheries. The Court upheld implementation of the interim final rule and the ESA process for the revised protection measures. The Court of Appeals upheld this part of the district court's decision on July 23, 2013. NMFS published the draft EIS for a 60-day comment period that ended July 16, 2013. NMFS received 13 submissions that contained 229 comments and is preparing a Comment Analysis Report. The draft report is scheduled for distribution to the Council in mid-September 2013. In October 2013 the Council is scheduled to recommend a preferred alternative for the final EIS. NMFS then will conduct an ESA consultation on the proposed action. The entire process should be completed by March 2, 2014.

Grenadiers Scott Miller, NMFS AKRO, presented a summary of a preliminary analysis of a proposed action to include grenadiers in the groundfish FMPs, either in the fishery or in the ecosystem component (EC) category. While not in the FMP, analysis of what stock status would be in conjunction with estimated biological reference points indicates that none of the grenadier species is overfished nor experiencing overfishing. Since present and past harvests are well below proposed annual catch limits (ACLs) and the biomass is high, the analysis concluded that there are no significant environmental effects of the proposed action. The final EIS (dated August 1981) for the BSAI Groundfish FMP stated that the OY range was computed by deducting 15% from the existing MSY range of 1,700,000 - 2,400,000 mt. The EIS stated that this reduction "is intended both to assure the continued health of the target species themselves and to mitigate the impact of commercial groundfish operations on other elements of the natural environment." The Teams noted that grenadiers catch were excluded from the calculation of the 2 million mt OY cap (as were deep-water slope species or Aleutian Islands groundfish although those harvests are currently included in the OY calculation) now set in statute. The Teams noted that other regulatory requirements could be implemented to enhance recordkeeping and reporting of grenadiers (or other species) instead of including them in the EC category under the FMPs to achieve the same goal. Given that these stocks appear to lack any conservation concerns presently and that there is no directed fishery or market for grenadiers, the Teams discussed whether action is needed.

The GOA Plan Team recommended that the Council consider adding grenadiers to the GOA groundfish FMP as a category "in the fishery" (and thus be subject to ACLs and accountability measures (AMs)).

The GOA Team's recommendation was consistent with recommendations made in previous years by the Team and based on: the majority of the grenadier biomass occurring in the GOA; the lack of required catch accounting and monitoring of the GOA grenadier catch under the status quo; and lack of economic costs to the GOA groundfish fisheries by their inclusion in the fishery. Management "in the fishery" would allow grenadiers to be targeted if a market develops without the need for a further FMP amendment.

The BSAI Plan Team recommended that the Council consider adding grenadiers to the EC category under the BSAI Groundfish FMP.

The BSAI Team's recommendation was based on the lack of a clear justification for inclusion "in the fishery" (and subsequent inclusion under the 2 million mt optimal yield cap) given the economic costs to the BSAI groundfish fisheries (and the Nation) of foregone harvests in other, more valuable fisheries. The Team acknowledged that including grenadiers in the EC would be one way to improve catch data and fishery monitoring.

The above rationales provided by the two Teams were sufficient to result in differing management recommendations between the two Teams.

The Teams evaluated the analysis and alternatives and recommended the changes listed below to the draft analysis for preparation of the initial review draft which is scheduled for release in mid-November. If approved, the earliest year in which harvest specifications would be set for grenadiers is 2015.

- Include a summary of the potential economic effects to industry in the BSAI in the EA, RIR, and IRFA in the executive summary.
- Revise net benefit summary to correct assumption of status quo alternative (i.e., unlimited harvest is currently possible under the status quo; therefore adding grenadiers "in the fishery" does not further enable the fishery).
- The description of lost revenue could be presented in different ways, such as, proportional reduction of other groundfish TACs (based on current rates of harvest in each fishery) to accommodate added grenadier TACs. Consider adding analysis of bycatch rates of grenadiers in different groundfish fisheries. Also note that because multi-species fisheries must balance a large number of species quotas, the potential harm to industry from additional quota could exceed the direct loss of the quota.
- An earlier productivity/ susceptibility analysis of target groundfish stocks also could be applied to grenadiers.
- Address ecological consequences of removing deepwater species.
- Provide additional discussion of proposed action to the national standards.

The Plan Teams commended the authors of the unofficial grenadier stock assessment for continuing to prepare the information necessary to add the group into the fishery under both groundfish FMPs, pending Council action.

It was mentioned that the Council could consider retasking the Non-Target Species Committee with addressing optimal management of other non-target species which could result in their management under the EC category (e.g., sculpins) but some on the Teams were concerned about adding more tasks to the ever increasing number of working group activities.

2013 Prohibited species closures. Mary Furuness summarized the current 2013 prohibited retention closures issued in-season for the GOA and BSAI species TACs that are projected or have been exceeded. http://www.afsc.noaa.gov/REFM/stocks/plan_Team/ 2013%20probited%20retention%20closures.pdf

Preliminary 2013 groundfish in the halibut target fishery In 2013, the restructured observer program provided new information and multiple issues resulted in the effects shown in a table presented by Mary Furuness: Pacific halibut landing reports are now included in the Catch Accounting System; there is more observer coverage in the small boat fisheries (previously catch estimates used proxies from larger vessels or catcher processors); fishing patterns vary each year; and halibut allocations and catches are less than in previous years. The table shows the total catch of groundfish in the IFQ halibut target fishery through September 2, 2013, the annual 2005 through 2012 average total catch, and the difference. In 2013, some of the groundfish species catches are higher than the 8 year averages. A more detailed report (by reporting area, retained and discarded) will be provided when the full year of 2013 data is available. http://www.afsc.noaa.gov/REFM/stocks/plan_Team/Preliminary%202013%20Groundfish%20in%20the%20Halibut%20target%209_2.pdf

Observer Deployment Plan

Craig Faunce described the 2014 Draft Annual Deployment Plan (ADP) for observers in the groundfish and halibut fisheries off Alaska. The ADP documents how NMFS intends to deploy observers in 2014. The restructured observer program was launched on January 1 and the first 16 weeks of the program were reviewed in June 2013 (this review will recur annually). The Council responded to that report with several recommended analyses, which the draft 2014 ADP responds to. The ADP will be finalized following the October Council meeting. For example, the Council requested an analysis of the amount of trips and lengths of trips for operations during two-month intervals in 2013 in order to evaluate the vessel-selection stratum. Shortening the duration of observation for these boats was not adopted due to a variety of factors; the most compelling factor was that realized sampling fractions of vessels have not met expected sampling fractions in every period examined.

The draft 2014 ADP also evaluated the anticipated deployment rates for trip- and vessel-selection strata given the anticipated 2014 budget and 2012 effort using the same simulation method as used last year. A new analysis compared methods to collect salmon genetic tissues for determining stock of origin in the Gulf of Alaska. The systematic sampling approach of every n^{th} salmon proposed by Pella and Geiger (2009) was presented as unattainable in the Gulf of Alaska trawl pollock fishery and is costly to attempt. Instead an alternative approach is proposed whereby salmon bycatch genetics are obtained by the vessel observer on randomly selected trips or vessels. From simulations, the alternative salmon sampling approach for the Gulf of Alaska would have resulted in more salmon obtained at a lower cost. If the at-sea deployment of observers was a random sample of the fleets' activities, unbiased estimates of salmon stock structure for the Gulf of Alaska should result, though the effective sample size is unknown with respect to each stock of origin.

Some issues were raised as to whether the restructured program is performing as intended. For example operators in trip-selection can now self-select the order of their trips and there is an observer effect with respect to tender operations. Furthermore, there was concern that vessel-selection had devolved into a "coalition of the willing", whereby no attempt by NMFS to obtain a random sample of vessels would result in a different group of vessels actually observed (only the same cooperative vessels are observed every time). There is an additional question of fairness in vessel-selection, since selection of vessels for a period is limited to the group that fished the two-month interval during the last year (so new vessels or those that did not fish the previous year have no chance of being picked). A possible alternative is pre-registration prior to selection for coverage as is done in State of Alaska crab fisheries.

The sampling rates for 2014 are anticipated to be below what was anticipated for 2013, and actual rates of coverage in 2013 for the vessel-selection stratum have not met NMFS targets. Further sampling biases likely are occurring as a secondary effect to the factors discussed.

The Plan Teams recommend that the sampling schemes be reviewed thoroughly and that necessary adjustments be made to increase the overall sample size by removing any program loopholes).

The Plan Team report will be provided to the Observer Advisory Committee in time for consideration at its September 18 - 19, 2013 meeting and to the Council at its October 2013 meeting.

Spatial management

In December 2012 the Council noted its plans to develop a policy for determining spatial management that involves the Council, advisory panel, and public, in addition to the Plan Teams and SSC. Jane DiCosimo presented a summary of the Council's April 2013 Spatial Management Workshop report, which was convened to explore a wide range of issues and recommend action(s) to the Council. In summary, the workshop recommended the development of a new Council policy for spatial management of groundfish, crab, and scallop stocks and process for the Plan Teams and SSC for alerting the Council of concerns regarding status quo management of particular stocks/assemblages. One additional management tool (subarea TACs) was identified for Council consideration; additional tools may be identified during public scoping.

One output of the workshop was a request to the Plan Teams to provide comments during their September meetings to the Council regarding next steps for developing the Council policy and process. Jane highlighted several unaddressed issues that were identified during the workshop for future consideration to help formulate the Council policy. Some were related to case studies that were presented during the workshop, while others were more general for development of a new policy.

Under a proposed new policy, the Council would retain the authority to make the decision on whether or not to revise spatial management of stocks based on new information. After identification of a biological concern about a stock/assemblage, the Council may choose to request further information/analysis to evaluate the full range of potential impacts of action as part of its new policy. The Plan Teams emphasized a necessary balance between a general policy and evaluating stocks/assemblages on a case-by-case basis.

The Teams understood that a new process would involve the Plan Teams and/or SSC alerting the Council of stock concerns on a case by case basis following application of the stock structure template. Then the Council would consider those concerns in a wider policy and management context, including economic effects on the commercial industry and the Nation. This is similar to the current scientific process but removes the prescriptive approach of setting spatial ACLs prior to Council consideration and public comment on the potential effects of such an action.

Additional questions/issues raised by the Teams for Council clarification in its future spatial management policy follow. Should a default policy exist for either or both of the following two cases: 1) data are insufficient to determine whether a biological concern exists, and 2) sufficient data exist to make such a determination but time or other resource constraints are anticipated to prevent those data from being analyzed for several years? What defines sufficient evidence? Should this be a judgment call on the part of the scientists or should objective criteria be developed? Have risks been appropriately characterized? Management (e.g., economic) costs are difficult to evaluate under current practices during the Plan Team meetings.

The stock structure template and the work of the Teams characterize the biology of a subject stock/assemblage, but further work is needed to address economic and/or management impacts. Risk considerations should include the probability of exceeding biological benchmarks. Mitigating any lack of information on stock structure is particularly important for stocks with less spatial movement, to prevent loss of stock productivity. Having sufficient data to estimate risk thresholds continues to be a challenge.

The Teams propose to continue to apply the stock structure template on a case by case basis and raise conservation concerns, as needed. The Teams should strive for consistency across stocks under an FMP and across FMP areas. Additional information could be included in the stock structure template to allow for better consideration of risk (e.g., variability in spatial biomass estimates from the survey), understanding that information is lacking on explicit quantification of risk.

The Teams recommend that the Council consider the following in developing new policy and process for determining spatial management of stocks/assemblages.

- Provide specific guidance on the role of the Teams;
- Develop a proactive default policy that covers both of the following cases: 1) data are insufficient to determine whether a biological concern exists, and 2) sufficient data exist to make such a determination but time or other resource constraints are anticipated to prevent those data from being analyzed for several years;
- Clarify whether the current inconsistencies in spatial management between the two FMP areas that were summarized by the Stock Structure Working Group should be further examined or revised (and to whom such a charge would be assigned);
- Two potential pathways for the role of the Teams in the Council's future policy:
    1. One approach would have the Plan Team(s) alert the Council when either Team or both Teams identify a biological concern about a stock/assemblage; it then would await direction from the Council on next steps (i.e., the default policy would be triggered or specific direction to the Teams by the Council would be provided.
    2. Another approach would have the Team(s) consider economic and management issues when it identifies a biological concern for a particular stock/assemblage:
       a) By adding new members with in-season management and economic expertise to the stock structure working group (and possibly renaming the working group) so that biology, economics, and management implications are included in the determination of whether the Team(s) have a concern regarding status quo management of a stock/assemblage; or

       b) The Team(s) would discuss the biological, economic, and management implications at the full Plan Team meeting. If stock assessment authors identify biological concerns in their application of the stock structure template to their stock/assemblage, then they would initiate a request for economic and in-season management effects when determining whether to raise concerns for a stock/assemblage.

Highlights of revised NS2 guidelines

Martin Dorn, who served on the committee to revise Federal guidelines for National Standard 2 (NS2), summarized the revision of those guidelines that was published in the Federal Register on July 19, 2013 (p. 43066-43090). The goal of the revision was to bring the NS2 guidelines into compliance with the MSRA. More specifically, the revision gives guidance on what constitutes best scientific information available (BSIA); scientific peer review standards; the role of SSCs in the review of information; and the purpose, content, and availability of SAFE reports.

The drafters paid special attention to the qualities advocated in a 2004 National Research Council report, *viz*., relevance, inclusiveness, objectivity, transparency, timeliness, verification, validation, and peer review. The revised guidelines also align with NMFS' scientific integrity policy. The revised guidelines describe how to avoid conflict of interest. For example, reviewers must not have contributed to the development of the scientific information under review.

The revised guidelines consider the development of BSIA to be a dynamic process involving continuous improvements. External reviews (if any) are to feed into final review by the SSC (i.e., the SSC is the final arbiter of BSIA). SAFE reports are emphasized. Consistent with their overall focus on transparency, the revised guidelines require that SAFE reports be made available on the Web.

Overall, Martin's perspective was that the present groundfish SAFE reports are consistent with the revised guidelines. One possible change suggested by Martin was to include, or otherwise provide a clear Web link to, the December SSC minutes in the SAFE reports.

Annual Catch Limits II

Grant Thompson provided an overview of issues relating to amending the groundfish FMPs to revise how NS1 revisions relating to Annual Catch Limits (ACL) are being met. There are three main issues addressed in the discussion paper.

1. Expanding or otherwise changing the role of scientific uncertainty in the harvest control rules.
2. Establishing a numeric Minimum Stock Size Threshold (MSST) in FMPs.
3. Accounting for total catch removals.

Grant reviewed the options listed for each issue, comments from the SSC and Plan Teams, and SSC comments on the Advanced Notice of Proposed Rulemaking. The Teams discussed the alternatives for each issue and listed their advantages and disadvantages as noted below, and provided recommendations on moving forward where possible.

1. Expanding or otherwise changing the role of scientific uncertainty in the harvest control rules. Three options were listed for moving forward.

Option 1- P* approach

Option 2- Decision Theory. A possible sub-option would be to use DT to set an upper limit on TAC rather than ABC

Option 3- Combine both approaches and use whichever gives a lower ABC. As with #2, one possible suboption approach would be to use this approach to set an upper limit on TAC rather than ABC.

The Teams discussed each approach. Some members preferred the P* approach for its straightforward simplicity despite the drawback of not resulting in an optimum harvest level. Others noted that the Decision-theoretic approach was preferable as it allows consideration of consequences in addition to probability. The Teams discussed the relative pros and cons of both approaches with respect to ease of understanding and balancing risk. One Team member noted that the P* approach could be augmented with an objective function, which might fit under the construct of option 3.

The Teams did not recommend a preferred alternative for this issue, but did recommend that any future analysis of the DT approach consider a variety of utility functions. It was noted that AFSC economist Chang Sueng has done some work in this regard. Furthermore, the Teams recommended that analysis of all options should evaluate risk for a range of years and species.

2. How to set a numeric MSST?

The options being considered under issue 2 are: Option 1-The greater of a) ½ B_{MSY} or b) smallest equilibrium stock size that could reach B_{MSY} within 10 years if fished at F_{OFL}; Option 2-Same as Option 1, except b) uses disequilibrium stock size rather than equilibrium stock size; Option 3-same as Option 1 except equilibrium stock size is replaced with the smallest stock size with the same relative age structure as the current stock. The Teams discussed all three options, noting that Option 1 appears to be the simplest to evaluate. The Team did not make any recommendations on this issue.

3. Accounting for total catch removals.

The options under consideration for issue 3 are the following: Option 1-Clarify what catches go into assessments and what is assumed when computing reference points; Option 2-Clarify what counts against what in harvest specifications (e.g., OFL, ABC, OY); Option 3-Set TAC below ABC by an amount

sufficient to keep total catches below ABC; Option 4-Redefine ABC and ACL to be exclusive of certain types of removals.

The Teams had previously recommended that AKFIN provide a single source of removals and that all authors include a risk analysis. This is the expected practice at present, although not all authors are including a risk analysis.

The Teams recommended that SAFE chapter authors continue to include "other" removals as an appendix. Optionally, authors could also calculate the impact of these removals on reference points and specifications, but are not required to include such calculations in final recommendations for OFL and ABC.

The next step is to develop a technical analysis of the three issues. Timing for initiating a joint groundfish FMP amendment is not yet determined.

The Teams commended the analyst for the work to date and encourage further development of the analysis, while noting that there is no pressing need to move forward on an accelerated basis.

Rockfish CIE Review

Paul Spencer provided a summary of the AFSC Center for Independent Experts (CIE) review of GOA and BSAI rockfish stocks that occurred in April 2013. The terms of reference for the review were broad, covering both data rich and data poor species. The reviewers responded with many ideas for improvements and a suggestion that future reviews focus on specific topics.

Most of the criticisms on data limitations focused on whether trawl survey biomass estimates sufficiently accounted for aggregated spatial distributions and if the estimates should be considered useful. Alternative approaches range from modeling trawl survey biomass estimates with habitat information using general linear modeling techniques to using random walk models for Tier 4 and 5 to "smooth" the time series of survey biomass estimates. For age-structured assessments, recommendations included improved estimation of key model parameters such as natural mortality and maturity, evaluation of model fit to the age plus groups, and inclusion of sensitivity analyses in the SAFE reports. For data poor stocks the reviewers suggested developing management strategy evaluations (MSEs) and investigating the use of "hierarchical" models.

All three reviewers noted there is evidence supporting stock structure and that management units should be reasonably small to reflect this. The authors noted reviewer recommendations to allocate and monitor catch among management subareas are consistent with recommendations of the NPFMC stock structure working group. For all rockfish stock assessments, the reviewers suggested developing approaches for apportioning OFL and ABC that are comparable across species and regions and to develop comparable survey averaging procedures for determining both ABC and apportionment.

The authors agree with the majority of comments and suggestions provided by the reviewers and will evaluate appropriate recommendations. The authors noted that a few changes will be incorporated in this year's assessments but that any recommendations that result in major changes to the models or methods will be presented next September.

The Teams discussed the need to provide a central repository for accessing CIE reports now that numerous CIE reviews have occurred and obtaining review documentation can be troublesome. Developing a website link that is associated with the existing stock assessment reports found online would be advantageous.

The Teams recommended that AFSC pursue creating a website or reference location for all CIE materials including reviews and responses so CIE documents can be easily accessed, unless a similar repository is created by NMFS HQ.

Non-target species CIE review

Liz Connors presented a summary of results from the May 2013 CIE review of non-target species stock assessments. Responses from individual stock assessment authors will be folded into November stock assessments, as possible. CIE reviewers suggested that future reviews focus on specific topics and fewer stock assemblages. The reviewers noted that the AFSC is further along at looking at non-target stocks than most other regions. In general, the major topics that the reviewers were concerned about focused on spatial coverage of surveys, habitat coverage (e.g., untrawlable grounds), and the related issue of the assumed value of q = 1 for survey biomass. The reviewers were generally supportive of the use of methods such as the Kalman model, rather than simple or weighted averages for determining biomasses.

Reviewers criticized the fixed 25% buffer between OFL and ABC and B * M for Tier 5 calculations. One reviewer recommended these calculations be species-specific and based on uncertainty, and language in Tier 5 guidelines should be modified to define "reliable" biomass. Aging procedures and methods for estimating M were thought to be generally good. Some reviewers criticized the fixed time period for the catch history in Tier 6 calculations, and recommended that the time period be species specific. Use of an "expert knowledge" model was proposed by a reviewer as a way to convert biomass indices to absolute biomass and provide ABC values for some stocks. This model considers areal availability, vertical availability, vulnerability, and relative proportions of biomass in trawlable and untrawlable grounds. A theoretical model that uses life history information was recommended by one reviewer for octopus. Computer code was provided for this model.

Some other comments brought up by the CIE review included; 1) suggestions for modifying the consumption model estimates for octopus, 2) concurrence with present methods for Tier 6 calculations for squid and sharks 3) concerns about extrapolations from deep to shallow depths for grenadiers, 4) overly conservative estimates of M for skates, 5) suggestion to add a subset of random stations to the fixed longline survey station design, and 6) suggestion for the use of more experienced non-target age readers from other labs to check on ageing methods.

The Teams recommended that the SEVAR (survey/exploitation vector autoregressive) model developed by Grant Thompson be considered for application to some non-target species along with the CIE "expert knowledge" model. The only data requirements for the SEVAR model are time series of survey biomass (either relative or absolute) and total catch, with standard errors for both.

Essential Fish Habitat Description Refinements and the Fishing Effects Model

John Olson presented this topic. The Essential Fish Habitat (EFH) review occurs every five years; the next review is scheduled for completion in 2015. Although there are ten required EFH components, all of which will be updated in 2015, the authors are focusing on three: EFH Description Refinements, Fishing Effects Model, and Non-Fishing Impacts. There are four EFH "levels" within each EFH description, and the goal is to define EFH at highest level. The goal is to move to Level 2 or higher using new information. The authors will look for EFH expansion, contraction, or new descriptors. The current fishing effects model has been reviewed, and although the model and parameters are still valid after review, parameters will need to be updated.

The Teams discussed using higher abundances or densities from fishery data or survey data to further describe habitat relative to areas of lower abundances or densities. The Teams also discussed how to deal with fishery effort and vessel monitoring systems. There are some caveats with using fishery effort, but the Teams agreed that this is an important component of the spatial analyses of EFH.

The Teams recommended that if there are analyses or tasks assigned to stock assessment authors, that they be assigned during January to June rather than July to December to allow for appropriate time for authors to complete the work and accommodate the stock assessment cycle.

Report of the Retrospective Investigations Group

The retrospective investigations group (Hanselman, Clark and Sigler) was formed by the Groundfish Plan Teams in November 2011 in response to an SSC request. In September 2012 the group presented a document that summarized some past work on retrospective analyses, drawing largely from the report produced by the Woods Hole workshop on retrospective patterns (Legault 2009). The workshop concluded that there are no easy criteria to determine when a retrospective pattern is severe enough to render an assessment unacceptable. Several examples of Alaska stocks were shown; the group suggested that retrospective patterns should be dealt with on a case-by-case basis and that patterns should be investigated by examining which parameters and data might be responsible for the pattern. The group did not recommend that a retrospective pattern should necessarily be "fixed," as there is no way to be certain that the "fix" is any closer to the truth. Nevertheless, it is appropriate to investigate potential causes for assessments with substantial retrospective patterns. Team members suggested that a strong pattern could be used as a rationale to recommend a higher or lower ABC than otherwise would have been recommended.

Authors of 2012 groundfish assessments were asked to complete retrospective fits with terminal years going back to 2002 and to plot spawning biomass and the relative differences between the retrospective estimates and the reference estimates from the 2012 assessment. At this meeting Dana Hanselman reported the group's compilation and analysis of retrospective runs for 20 GOA and BSAI stocks. Four measures of retrospective performance were computed for each stock, the most meaningful being (Bob) Mohn's rho (revised), which is the average relative difference between the biomass estimate in the terminal year of a reduced fit and the corresponding estimate in the reference fit to the full data series. The absolute values of this statistic ranged from 0.01 to 0.44, with an average of 0.20, which is to say that retrospective variability on the order of 20% is routine in our groundfish assessments. Dana reported on correlations between retrospective performance and various features of the data and the stock in each assessment. He also suggested some specific issues and assessments for further examination.

Ian Stewart reported that a study of retrospective performance of West Coast assessments which included changes in authors and models as well the effect of additional data showed that 20% was at the low end of retrospective variability. It was also suggested that retrospective plots should show the error bars on the assessment estimates. If this were done, some conclusions about the severity of retrospective patterns may differ from simple examination of point estimates.

The Teams had some discussion of whether an ad hoc correction should be applied to an assessment that shows a persistent retrospective change in the same direction, and decided against making such a recommendation. There was also a proposal to ask authors to report the realized retrospective performance of actual past assessments (like the West Coast study), but the Teams decided that would be a difficult task and not really relevant to model selection and ABC determination in practice.

In conformity with the main recommendations of the working group, the Teams recommended the following:

1. **Assessment authors should routinely do retrospective analyses extending back 10 years, plot spawning biomass estimates and error bars, plot relative differences, and report Mohn's rho (revised).**
2. **If a model exhibits a retrospective pattern, try to investigate possible causes.**
3. **Communicate the uncertainty implied by retrospective variability in biomass estimates.**
4. **For the time being, do not disqualify a model on the grounds of poor retrospective performance alone.**
5. **Do consider retrospective performance as one factor in model selection.**

Referring to the second recommendation, Ian Stewart said that applying different weights to the various objective function components could reveal conflicts among data sources that produce retrospective patterns.

Stock Recruitment Working Group Report

Grant Thompson provided the "Phase III" Report of the Joint Groundfish and Crab Plan Team/SSC Working Group on Assessment/Management Issues Related to Recruitment. The working group members are Robert Foy, James Ianelli, Diana Stram, Grant Thompson, Anne Hollowed, Farron Wallace, André Punt, Buck Stockhausen, and University of Washington graduate student Cody Szuwalski. One of the working group's main activities this year was to sponsor, along with CSIRO (Australia) and the US–ROK Joint Agreement Fisheries Panel, a "Workshop on Setting Biological Reference Points in a Changing Climate".

The Teams' comments from September 2012 and December 2012 are addressed in this report. All alternatives for all topics now include at least a qualitative analysis, two appendices containing quantitative analyses of topics B1 and B7 have been added in the Phase III report, and all "provisional recommendations" have been replaced by "recommendations."

Topics and Alternatives:

A1: Current policy on identification of regime shifts

Working Group Recommendation: Because topic A1 is restricted to the status quo by definition, no other alternatives were presented for this topic. Also, because the status quo is a matter of fact, no recommendation is made for this topic.

A2: Possible improvements to current policy, including consideration of risk

- *Alternative A2.1:* Do not consider effects of regime shifts.
- *Alternative A2.2:* Estimate breakpoints in the time series of recruits using an appropriate statistical test such as STARS, AICC, or likelihood ratio, and possibly employing additional constraints such as a minimum length for the current regime or a maximum permissible CV for parameter estimates.
- *Alternative A2.3:* Estimate breakpoints in the time series of recruits per unit of spawning using an appropriate statistical test such as STARS, AICC, or likelihood ratio, and possibly employing additional constraints such as a minimum length for the current regime or a maximum permissible CV for parameter estimates.
- *Alternative A2.4:* Estimate breakpoints in the time series of an environmental time series such as the Pacific Decadal Oscillation (PDO) using an appropriate statistical test such as STARS, AICC, or likelihood ratio, and possibly employing additional constraints such as a minimum length for the current regime or a maximum permissible CV for parameter estimates.
- *Alternative A2.6* (Working Group Recommendation): Condition the productivity parameter of a two-parameter SRR on one or more F_{MSY} proxies specified or implied by the harvest control rules in the respective FMP, then estimate the scale parameter of the SRR for every age- or length-structured stock assessment, with breakpoints estimated using a decision-theoretic approach to compute the optimal breakpoints, possibly employing additional constraints such as a minimum length for the current regime or a maximum permissible CV for parameter estimates.

B1: Establishing criteria for excluding individual within-regime year classes from estimates

- *Alternative B1.1:* Do not exclude any individual within-regime year classes from estimates.
- *Alternative B1.2:* Exclude all year classes with model-estimated CVs greater than X
- *Alternative B1.3:* Exclude all year classes with model-estimated CVs greater than a fraction X (<1) of the CV at the first age included in the model.
- *Alternative B1.4:* Exclude all year classes with model-estimated CVs greater than a fraction X (>1) of the asymptotic CV (i.e., the limiting CV that is approached as the number of times a year class is observed becomes large)
- *Alternative B1.5* (Working Group Recommendation): Defining $A_{10\%}$ as the first age with a survey selectivity of at least 10% and X as floor(1/(1-exp(-sqrt(M)))), for any species with a lifespan greater than $A_{10\%}$+1 years, exclude all year classes spawned within the last $A_{10\%}$+X years.

The Teams recommended that the working group conduct some further analysis and that the working group consider another alternative which uses $A_{50\%}$ (age at 50% selectivity).

B2: Use of "conditioned" stock-recruitment parameters (e.g., $F_{MSY}=F_{35\%}$, $B_{MSY}=B_{35\%}$)

- Alternative B2.1: Do not use conditioned stock-recruitment parameters.
- Alternative B2.2: Condition the SRR by forcing $F_{MSY}=F_{35\%}$ *and* $B_{MSY}=B_{35\%}$
- Alternative B2.3 (Working Group Recommendation): Condition the SRR by forcing $F_{MSY}=F_{35\%}$, but estimate BMSY as a free parameter.

The Teams requested clarification as to how the preferred alternative would interface with the assumptions already included in the standard projection model and recommended further analysis of this topic.

B3: Specification of priors, including hierarchical Bayes and other meta-analytic approaches

- *Alternative B3.1*: Use non-constraining uniform priors only.
- *Alternative B3.2*: Use priors derived from hierarchical Bayes analysis of congeneric stocks.
- *Alternative B3.3* (Working Group Recommendation): Use priors that reflect the true amount of prior uncertainty. Can include hierarchical Bayes as appropriate.

B4: Alternatives for setting/estimating σ_R

- *Alternative B4.1*: Set σ_R =0.6.
- *Alternative B4.2*: Estimate σ_R iteratively.
- *Alternative B4.3*: Estimate σ_R as a free parameter.
- *Alternative B4.4* (Working Group Recommendation): Estimate σ_R according to the method presented at the 2012 recruitment workshop.

This method in the preferred alternative consisted of the following three steps:

1) Estimate recruitment deviations when σ_R is set, provisionally, at a high (i.e., non-constraining value); label this vector r.

2) Estimate σ_R iteratively by matching the standard deviations of the estimated recruitment deviations; label this σ

3) Obtain a final estimate of σ_R as sqrt(var(r)- σ(stdev(r)- σ)). See Annex 2.1.1 of the 2012 BSAI Pacific cod assessment (p. 442-445).

The Teams recommend further analysis, including consideration of a full Bayesian integration as an additional alternative.

B5: Determining "reliability" of the FMSY pdf

- *Alternative B5.1*: Determine that the FMSY pdf is reliable if no parameter has an estimated standard deviation (obtained by inverting the Hessian matrix) greater than X or a CV greater than Y (values of X and Y to be determined).
- *Alternative B5.2*: Determine that the FMSY pdf is reliable if the Hessian matrix is positive definite.
- *Alternative B5.3* (Working Group Recommendation): Determine that the FMSY pdf is reliable if:

1) The Hessian matrix is positive definite;
2) The average ratio of harmonic mean multinomial effective sample size to arithmetic mean multinomial input sample size exceeds unity for all size composition and age composition likelihood components;
3) The mean standardized log-scale residual for each survey abundance likelihood component is between -0.1 and 0.1;
4) The root-mean-squared standardized log-scale residual for each survey abundance likelihood component is between 0.9 and 1.1;
5) The assessment demonstrates that annual variability in selectivity at age (or length) and weight at age (or length) was considered during the process of model development, using either internal or external estimation of variability; and
6) The assessment demonstrates that sensitivity to alternative starting values for the parameters was examined before accepting the results from the model.

During discussion, members of the working group clarified that item #3 in the above list was not intended to prevent authors from adjusting the observation error variances that are routinely supplied by the RACE division, but rather was intended simply to ensure that variability in model estimates is consistent with whatever observation error variances are specified in the model.

The Teams recommended that, for composition data, the working group consider adding one or more criteria pertaining to patterns in residuals (e.g., Pearson's chi-squared test). It was noted that the above criteria could also apply (perhaps with some modifications) to Tier 3 stocks. The Teams also recommended that the working group consider adding one or more criteria pertaining to retrospective analysis.

B6: Alternatives to estimation of SRR parameters

- *Alternative B6.1*: Discontinue research into alternative assessment and management methods that are robust to lack of information about SRR parameters so as to free up more resources for research on estimation of SRR parameters.
- *Alternative B6.2* (Working Group Recommendation): Continue trying to estimate SRR parameters whenever possible, but also continue research into alternative assessment and management methods that are robust to lack of information about these parameters.

B7: Preferred measure of central tendency in recruitment

Appendix F in the Phase III report contains an analysis relevant to this topic.

- *Alternative B7.1*: To estimate Tier 3 reference points, scale spawning per recruit by the median of the recruitment time series for the current regime.
- *Alternative B7.2* (Working Group Recommendation): To estimate Tier 3 reference points, scale spawning per recruit by the mean of the recruitment time series for the current regime.

During Team discussion, some members expressed a preference for Alternative B7.1 (median), citing the reasons given in the working group report.

The Plan Teams recommended further analyses, in particular expanding Appendix F to include real-time updating of estimates of the mean and median (rather than assuming that the true values are always known).

C1: Best practices for incorporating environmental forcing in stock assessments

- *Alternative C1.1*: Do not incorporate environmental forcing in stock assessments.
- *Alternative C1.2*: Identify plausible environmental covariates of recruitment outside of the assessment model; then include them (adjusted for sign, as appropriate) as pseudo-surveys of recruitment in the assessment model.
- *Alternative C1.3* (Working Group Recommendation): Identify plausible environmental covariates of recruitment outside of the assessment model; then include them as explanatory variables in the SRR, with parameters estimated inside the assessment model.

The Plan Teams recommended that interactions between environmentally-induced recruitment variability and σ_R be evaluated, along with the relationship between environmental variability and recruitment autocorrelation.

C2: How knowledge of environmental forcing changes perceptions of reference points

- *Alternative C2.1*: Use knowledge of environmental forcing to compare past, present, and projected stock sizes with past, present, and future values of environmentally forced reference points.
- *Alternative C2.2* (Working Group Recommendation): Acknowledge that current knowledge of environmental forcing is insufficient to alter perceptions of reference points quantitatively.

Survey Averaging Working Group Report

A consistent method for averaging (or smoothing) survey biomass is needed. The overall goal is to attempt to remove the observation error associated with survey biomass estimates without removing any underlying information on interannual variation in stock size (i.e., the "process" error). The tasks for this group were to evaluate methods to produce a reliable estimate of biomass for Tier 5 stocks/complexes, how to best to smooth survey data to apportion ABC by regions, and how to deal with subareas that are not sampled in particular surveys. The working group took a simulation approach focusing on a POP-like stock and a pollock-like stock. Estimation methods tested were based on state-space models with process and estimation error. This year's working group report built on last year's report.

Three survey averaging methods were considered: 1) exponential smoothing; 2) random effects models; and 3) smoothers based on generalized autoregressive integrated moving average (ARIMA) models.

Exponential smoothing consists of applying weights to a time series of survey biomass estimates that exponentially decay for older surveys. For cases with a constant ratio of observation variance to process variance, exponential smoothing gives the optimal time series fit (as measured by minimizing the error in the one-step ahead forecasts), and the exponential weight parameter can be estimated with either a Kalman filter or an ARIMA time series model. Whereas Kalman filters obtain the marginal likelihood profiles for parameters of interest with exact equations that rely upon properties of linear systems and normal error distributions, random effects models achieve this purpose with fine-scale numerical approximation that allows more flexibility in the transition and observation equations and error distributions. Both the exponential smoothing model and the random effects model (as configured for the working group's report) considered the underlying state dynamics to be a random walk. In contrast, generalized ARIMA smoothing does not make this assumption and is based on the best-fitting ARIMA model. When the best-fitting ARIMA model is a random walk model (which was often the case in the simulated data sets), the three smoothing procedures perform similarly with respect to the bias and variance in the most recent survey estimate. When the best-fitting ARIMA model is something other than a random walk model, generalized ARIMA smoothing can decrease bias but may increase variance. Also described for future work was the SEVAR (Survey/Exploitation Vector Autoregressive) model, a state-space model with survey biomass and exploitation rate as state variables. The covariance between these state variables allows the SEVAR model to estimate the MSY exploitation rate.

The Working Group recommended use of the random effects model to obtain smoothed estimates of survey biomass. This model is simple to apply, flexible, and generally performed well across the simulated data sets (particularly with respect to variance of estimates). The flexibility of the random effects model can accommodate different error distributions on survey biomass estimates. Consistent with the practice in most stock assessments, the Working Group recommended lognormal error distributions unless there is information indicating that an alternative error distribution would be more appropriate. A disadvantage of the random effects models is that other methods may be better in some situations. However, other methods are equally or more complex than the random effects model. For example, generalized ARIMA smoothing requires consideration of multiple models and hindcasting and forecasting with the selected ARIMA model, and exponential smoothing requires estimation of the exponential weight parameters with either a Kalman filter or an ARIMA model. In addition, the exponential smoother assumes constant observation error variance, whereas the random effects model can accommodate either constant or time-varying observation error variance. The variation in the time series of survey biomass variance estimates may reflect changes in catchability and/or availability, or simply sampling variability from a constant underlying sampling distribution. Remaining tasks for the workgroup are to evaluate subarea allocations and further test the SEVAR model.

The Teams recommended that Tier 5 stock authors compute and present both random effects and status quo methods this year in their assessments, specifically using by-year survey variances for the random effects model, with the author to evaluate which method is preferred. The code to perform this will be made available to all authors. For area apportionment, the Teams recommended that the working group continue its analysis.

Sablefish

Dana Hanselman gave an update for GOA/BSAI sablefish. Preliminary longline survey results indicate that the numbers of sablefish appear to be substantially down in 2013 relative to 2012 and 2011. Short spine thornyhead numbers increased on the longline survey this year, while numbers for all other species appear to have decreased. The 2008 sablefish year class that was visible in the length and age frequency histograms is no longer evident as a separate "pulse;" these fish have merged with the rest of the age classes and therefore it does not appear to be as strong as was initially indicated. Preliminary observations for toothed whale depredation during the longline survey were stable to slightly increased. Auke Bay staff has produced several publications on whale interaction with longline gear, and depredation research continues with the goal of accounting for whale depredation in the survey and fishery indices. The

Council is considering an industry proposal to lift a prohibition on the use of pots in the GOA to avoid whale depredation issues in the fishery. There is a standardized sablefish CPUE publication in preparation, and a goal of obtaining annual variance estimates for all species captured in the longline survey. Sablefish maturity studies are ongoing to look at differences in maturity between summer and winter samples based on visual scans. Katy Echave is working on a project to determine sablefish spawning location using satellite tags. Sablefish movement research continues; Dana hopes to incorporate British Columbia and Washington sablefish tagging data into a movement model. Tagging of juvenile sablefish in St. John the Baptist Bay continues annually, and abundances of juvenile sablefish were fairly high this summer. There is a graduate student working on a master's thesis to look at juvenile sablefish diets in St. John the Baptist Bay. The St. John the Baptist study, along with the GOAIERP results will eventually be incorporated into an ecosystem report card for the Gulf of Alaska. In 2014, the sablefish stock assessment is scheduled for a CIE review (last review was in 2009).

Total Current Year Removals

Total current year's removals are inconsistently calculated across stock assessments. Assessments should incorporate the most recent, complete catch data from the last calendar year, as well as an estimate of the complete catch for the current year. For example, the total catch for the current year could be estimated by using an expansion factor representing the average fraction of catch taken between two dates (e.g., Oct. 1 and Dec. 31) in the last three complete years.

The Plan Teams noted that there are timing issues and other factors associated with how authors estimate the current year's total catch. Assessment authors may use different data sources, and assessments that are completed earlier in the year must incorporate larger proportions of estimated catch, versus actual catch. Furthermore, historical Plan Team guidance, proximity of the current year-to-date catch and TAC, and past practice by different authors may affect how a current year's catch is calculated.

The Teams recommended that each stock assessment model incorporate the best possible estimate of the current year's removals. The Teams plan to inventory how their respective authors address and calculate total current year removals. Following analysis of this inventory, the Teams will provide advice to authors on the appropriate methodology for calculating current year removals to ensure consistency across assessments and FMPs.

Value of Surveys

The Teams were briefly notified about an analysis that describes the value of assessment surveys and that it is outdated

The Teams recommended that the AFSC update the analysis for future discussion.

Ecosystem Considerations

Stephani Zador gave a summary of the expansive Ecosystem Chapter. At time of writing, approximately 33 updates were received for the Bering Sea. As always, the Ecosystem Chapter will continue to undergo changes until just prior to the November meeting. The author incorporates as much new information as possible. No report cards are in this iteration. The GOA assessment is scheduled to be developed during winter 2014 in coordination with the GOAIERP.

In the North Pacific in the last year, the Aleutian Low was weak, the PDO was negative, the upper ocean was cool, and the ENSO was neutral. The negative PDO, North Pacific Index (NPI), and sea level pressure anomalies all work together to affect ocean temperature. The NPI is usually opposite ENSO, but was not in 2012/13. The North Pacific Gyre Oscillation (NPGO) was still positive, causing strong flows in the Alaska and California currents.

The forecast for winter 2013/14 using the National Multi-Model Ensemble, which is an average of six models, predicts slightly greater than average El Nino, warming in central North Pacific, cooling in EBS, and likely warming of Alaska waters in the next 2-3 seasons.

In the EBS in 2013, surface temperatures were warm and bottom temperatures were cool (warmer than 2012 and similar to 2007). Tom Wilderbuer's advection model indicates that 2013 was bad for recruitment of winter-spawning flatfish, with larvae likely advected offshore. The BASIS survey in 2012 had a jellyfish biomass twice as large as in 2011. One station had half the biomass; inter-annual variability in abundance might be due to oceanographic forcing on early life stages.

In general, energy density of age-0 walleye pollock is better when it is cooler. However, when it is too cold, the result is small-sized fish. There is a strong correlation between energy density in fall of age-0 pollock and subsequent age-1 and age-3 recruitment estimates. Pollock were very small in 2012; therefore the average energy content per fish was small. Fish were skinny, and although they had the same energy density per gram, each fish weighed less, therefore energy per fish was low. Predictions are that the 2012 pollock year class will be low.

There are noteworthy hot topics for the GOA in 2013. There were no mushy halibut; the leading hypothesis is that poor nutrition causes the myopathy. Thus better muscle condition might indicate better foraging conditions for halibut in 2013. There was a large pulse of larval/age-0 pollock that was widespread in May 2013 and also seen in August-September 2013 off the Alaska Peninsula. Abundance of age-0 pollock in 2013 was the second highest in last 14 years, but larval abundance does not always correlate with recruitment.

Strong westerly winds in the GOA in winter 2012/13 forced open-ocean water into Southeast Alaska. There was northerly flow following the 1976/77 regime shift; now shift to more southerly. The question is whether this is meaningful. The continuous plankton recorder showed no outstanding abundance anomalies for the GOA shelf, although the zooplankton was of a larger size. The NE Pacific had the highest biomass estimate in the last 14 yrs. The latest GOA ichthyoplankton abundance data, 2010 and 2011, was similar to the long-term average, except that rockfish had bigger deviations. The GOA small mesh trawl survey in the western gulf caught few eulachon, juvenile pollock, herring, and pink shrimp. Pink salmon returns were forecast to be high in 2013. Chris Lunsford commented that 2013 witnessed the biggest pink salmon harvest in SE Alaska. In the ADF&G GOA trawl survey, gadids and flatfishes dominated the catch. Arrowtooth flounder and flathead sole are below average. Pollock had the highest abundance anomalies in the time series inshore, but was just above average offshore.

The Alaska-wide picture shows that all groundfish gears caught 40% below average annual take of seabirds in 2012. Seabird bycatch may be a good ecosystem indicator because, during 2011, bycatch of gulls and fulmars species increased whereas the migrant shearwaters decreased, potentially indicating poor food supply due to resident seabirds seeking alternate prey such as discards and migrants leaving the system. Litzow and Mueter updated Hare and Mantua's PDO analysis. There was a wide-spread regime shift in 1976-77; in 2008 there seemed to be a regime shift on a Pacific basin scale, but it did not persist beyond that time. Likewise, on an Alaskan scale, a 2008 regime shift was also indicated, which also did not persist.

The Fish Stock Sustainability Index (FSSI) for commercial and recreational stocks ranks no groundfish stock as overfished. However, BSAI octopus was considered subject to overfishing in 2012. Pribilof Island blue king crab is the only crab stock considered to be overfished. Alaska has the same FSSI score as in the past. Though there is an apparent overall reduction in EBS of "disturbed" area, interpretation of this statistic is problematic, because it also includes midwater pollock tows. Discards in the groundfish fisheries continue to decrease in all areas.

Marine Mammal Report

Lowell Fritz reported on the 2013 status of Steller sea lions and northern fur seals off Alaska. The Eastern distinct population segment of Steller sea lion is considered recovered and is expected to be removed from the list of ESA threatened species in 2013. Eastern Steller sea lions will still be protected under the MMPA. NMFS and its State partners will begin a 10-year post-delisting monitoring program to ensure that the recovery is maintained.

The 2013 Steller sea lion aerial survey was conducted in June-July from British Columbia through False Pass. Concurrent surveys were conducted in Washington, Oregon, and California. Results will be available by December.

Sea lion research in the Western Aleutian Islands included a boat survey this summer (cliff and skiff counts) as well as branding of pups on Agattu and Ulak for vital rates studies. Non-pup counts on rookeries (the majority of the population in summer) continued to decline through 2013, but haulout counts for non-pups do not have consistent trends (up or down). The pup count has been stable on Attu since 2010, but on Agattu it declined 17% from 2010 (stable since 2011 however).

A new method to estimate population trend was developed in response to comments from the CIE in its review of the 2010 BiOp. Details about the method can be found at: http://nmml.gitub.io/agtrend. The model uses data from all sites with more than 1 non-zero count. The other benefits of the model include:

- Accounts for survey methodology changes
- Can aggregate sites as desired (even after the fact)
- Forecast into the future (PVA)
- Handles different definitions of "trend"

This method was used for analysis of pup and non-pup data from 1990 – 2012 and obtained a trend estimate for 2000 – 2012. This analysis showed that the western DPS in AK increased at an average annual rate of 1.7% since 2000. Strong regional differences are apparent E and W. Samalga Pass: east increased at ~3% per year in the last 12 years, while west declined at ~1.5% per year. Breaking it down further, W. Aleutians is decreasing the quickest, with more positive population trends to the east. West of Tanaga Pass is where SSL populations continue to decline.

Comparing agTrend and trend site methods to analyze trends in pup and non-pup counts, regional trends are the same and there are no significant differences between regional rates, but variances tend to be lower with the agTrend method.

Five adult female Steller sea lions were captured and tracked with satellite tags between October 2012 and May 2013. There was a wide range of distances they traveled and places that they traveled to. Some of them would forage hundreds of miles offshore and others would stay closer to shore on their trips, suggesting a wide variety of foraging patterns and at-sea habitat use. Tag duration (time when the tag was transmitting data on location, dives, etc.) varied from 19 to 202 days. There was a seasonal pattern of movement. In April and May (as the breeding season approached), sea lions that took long trips in the winter began to take shorter trips, staying closer to where they would breed/pup in summer 2013. There is limited data on females that do not have pups. Analysis of these data is continuing.

2013-14 Research

- October 2013 – adult female capture/tagging C and W Aleutian Islands
- June and July 2013 – aerial surveys, branding pups and sighting effort, examining pups at rookeries
- October 2014 - adult female capture/tagging C and W Aleutian Islands

Northern fur seal pup production in the Pribilof Islands has declined 4.3% per year between 1998-2012, on both St. George and St. Paul.

Fur seal future research in 2013-14 will include satellite tagging, tag siting, pup production estimation, and research on pups on rookeries/tagged females and sub-adult males.

GOAIERP report

Olav Ormseth presented the GOAIERP update for 2013. All content was noted as preliminary due to the fact that the field season is roughly 2/3rds complete. The project consists of multiple surveys and integration of retrospective and modeling efforts. Three primary model scales are linked: regional ocean, NPZ, and IBM models. The general goal is to provide context for the two years of full GOAIERP through analysis of other time-series. Field update inshore: fewer YOY pollock and Pacific cod than in 2011, more juvenile Pacific cod, YOY herring abundant, pink and silver salmon abundant, large differences in salinity among sites. Field update offshore: YOY pollock abundant in east, less so in the west, YOY Pacific cod absent in east, scarce in west, YOY rockfish abundant in east off the shelf, lots of salmon. Analysis of GOA breakpoints: oceanography (SST, chlorophyll, PAR) shows east-west differences with CHL differing on- and off-shelf as well, upwelling also shows east-west difference, with much less to the east, fish CPUE and diversity shows higher catches to the west but higher diversity to the east. All these sources indicate breaks in a similar location just west of PWS. Potential mechanisms include storm tracks, Alaska Coastal Current moving offshore at Kayak Island, southern influence, PWS and Cook Inlet, shelf width, and topography. The project is also describing habitat via improved bathymetry and inshore site metrics to compare bays. The IBM for arrowtooth flounder (one of the five focal species) operates by moving through stages from eggs to various development stages through 300 days, while being moved by the ocean model. The primary investigation is probabilistic connectivity from spawning areas to juvenile habitat and identification of where the most successful spawning might be and which nursery areas might benefit as well as how variable these patterns are over time. Sablefish is also being modeled. Moorings are put out offshore in the spring through fall, measuring chlorophyll and salinity, with smaller moorings inshore for comparison. GOAIERP products potentially relevant for stock assessment and management include: improved understanding of early survival and recruitment dynamics; environmental and spatial effects (could feed MSEs); spatial issues, which can provide information for management and EFH work. Some products may also be useful as ecosystem background. The Teams made no specific recommendations.

Research Priorities

Diana Stram updated the Teams on the new process for recommending 5-year research priorities each year and progress towards developing a database to house all information related to research priorities. Council staff and AKFIN have been developing a database to facilitate the annual process of revising these research priorities, as well as to contain additional information on each, including progress to date, related issues, focus, and prioritization. Currently the Council is contracting with AKFIN to develop this database. The project will be completed by late October.

The SSC and the Council approved the annually updated 5 year research plan in June 2013. The Joint Plan Team's role is to provide annual revisions to the research priorities. Typically the Teams have done this in September (or in the past broken into sub-groups to provide revisions for a later teleconference meeting). The Teams discussed the process of annual revisions and the pros and cons of providing their input to the SSC in the past.

The Teams recommended that research priorities be compiled in conjunction with the annual assessment cycle. Species-specific priorities would be forwarded to the SSC via the Plan Team report in November rather than as a separate agenda item for the joint Teams. Topics would be checked to see if they are an existing research priority; if new, the necessary accompanying information for the database would be provided. Revised or new priorities would be added to each stock/assemblage summary and could be compiled into a section of the Plan Team reports. The Teams requested SSC review in October of this new Joint Plan Team protocol for compilation of annual 5-year research priorities.

If a more formal review by break-out groups is necessary, the expertise and background of each subgroup should be rotated so members can have a fresh look at various topics. Council staff should also review final 2013 priorities to ensure that priorities have been merged according to overlapping themes where possible to avoid redundancy in topics. There should be a mechanism for removing a priority from the list. Following SSC review in October, Diana Stram will update the Teams on the process necessary for this upcoming cycle.

Minutes

Bering Sea Aleutian Islands Groundfish Plan Team

September 12 - 13, 2013

North Pacific Fishery Management Council
605 W 4th Avenue, Suite 306
Anchorage, AK 99501

Mike Sigler	AFSC ABL (Co-chair)	Grant Thompson	AFSC REFM (Co-chair)
Jane DiCosimo	NPFMC (Coordinator)	Lowell Fritz	AFSC NMML
Kerim Aydin	AFSC REFM	Alan Haynie	AFSC REFM
Chris Siddon*	ADF&G	Dana Hanselman	AFSC ABL
Brenda Norcross	UAF	Mary Furuness	NMFS AKRO
David Barnard	ADF&G	Bill Clark	IPHC
Leslie Slater*	USFWS	Liz Chilton*	AFSC FMA

*participated in parts of the meeting via WebEx

The BSAI Groundfish Plan Team convened on Thursday, September 12, 2013, at 8:30 am. The Team acknowledged a new member, Liz Chilton, who was absent due to illness. All members are expected to attend the Team's next meeting in November 2013. More than 30 people attended at least one of the sessions.

Bob Lauth described results of the 2013 Bering Sea shelf survey. He presented information on: reconciliation of the RACE database with IPHC records of halibut survey catches, a request that stock assessment authors update all years in the time series with new survey results (because of revisions to historic data), fishing power corrections used from 1982-2006, new variance estimator, and a new SAFE chapter describing Bering Sea shelf survey results. Following a similar CIE recommendation, Bob proposed eliminating the fishing power corrections, which likely introduce errors into biomass estimates. The proposed new variance estimator addresses spatial autocorrelation in a systematic survey (the shelf survey returns to the same stations every year).

Bob described 2013 age sample sizes by species (up to 1,856 for walleye pollock), other data collections (e.g., CamTrawl (camera attached to the cod end to measure pollock size composition) studies on pollock), the environment, and how the timing of the survey has varied over the years. Surface temperature was average and bottom temperature was below average. Pollock biomass increased 30%, reaching the average value for the time series. The acoustic vessels of opportunity (AVO) index is based on acoustic data collected by groundfish survey vessels. The AVO index increased in both 2012 and 2013. Pacific cod biomass decreased slightly but remained above average. While pollock avoid the -1 deg C isotherm, Pacific cod avoid the 1 deg C isotherm. Yellowfin sole increased slightly and remained near average. Bob also presented the biomass trend for several other species.

Pacific cod catchability experiments were conducted in 2012 and 2013 to assess the previous finding that catchability for the EBS shelf survey is lower than catchability for the GOA survey. The 2012 experiment

compared Pacific cod catches between low-opening (2.5 m) and high-opening (7 m) nets. The experiment was conducted to supplement information on vertical distribution of cod from archival tags. The 2012 results found no significant difference in catching efficiency of the two nets (for 60-81 cm cod, the size range examined in the archival tag data). Acoustic data collected during the experiment confirmed that Pacific cod were closely tending bottom during the experiment. Some possible factors affecting vertical availability include prey type and availability (which for cod range from shrimp to capelin), dive response to vessel noise (which is common in other cod species), temperature, light, bottom depth, season, and area. Other factors may affect cod catchability (besides vertical distribution), including fish density, trawl speed, and spatial availability. The RACE scientists' current conclusions are that cod are semi-pelagic and undergo diel vertical movements, vertical availability to AFSC survey trawls needs more study, and, given that no difference in effective fishing height for the two nets was found in the 2012 study, investigations into other mechanisms for the finding of relatively low catchability of the EBS survey trawl should be pursued. Planned future work includes acoustic buoy studies in relation to trawling vessels, analysis of existing acoustic data to obtain quantitative estimates of vertical availability (Jorgensen NCRP proposal), and investigation of spatial availability of cod to the shelf survey.

The Plan Team recommended that studies of the vertical distribution of Pacific cod continue in order to test the previous finding that the average product of survey catchability and selectivity across the 60-81 cm size range is 0.47 (based on vertical distribution from archival tags). These studies should include: 1) analysis of existing fish acoustic data (as recommended by Bob Lauth); and 2) depending on the results of that analysis, repeat the 2012 experiment in an area where Pacific cod are distributed farther off bottom and using an acoustic buoy to measure vertical response to the passing vessel.

Ken Weinberg described results of a 2013 experiment on Pacific cod. This experiment addressed the question of whether larger, stronger Pacific cod out-swim the trawl. If so, this could, at least in part, account for the dome-shaped selectivity function estimated in the stock assessment model. Information from Pacific cod fishermen reported by Ken is that fishing vessels tow from 3.5-4 knots. In 2013, a short experiment was conducted which consisted of side-by-side towing by two vessels towing at 2 different speeds (3 vs. 4 knots). The result showed very little difference in size-specific CPUE, indicating little speed effect on survey selectivity.

EBS Pollock - density dependence in CPUE estimates from bottom trawl surveys

Jim Ianelli introduced survey information regarding density dependence in CPUE estimates from bottom trawl surveys. He also summarized some recent papers regarding walleye pollock that were published since last November.

Stan Kotwicki discussed correcting density dependence in CPUE estimates from bottom trawl surveys. In particular, he examined factors that affect the efficiency of bottom trawls at different levels of pollock density. Density dependence would result in biased indices and overestimates when the biomass is low. It also implies that survey catchability would be non-stationary in space and time (typically unaccounted for in assessment models).

The model predicts bottom trawl catch by integrating the backscatter within this effective fishing height (actual amount of fish in the water column that end up in the net), corrected for the acoustic dead zone and any other factors such as horizontal herding. The crux of the model is an exponential density dependence parameter. Results showed an exponential decline in trawl efficiency as catch increased, and also different trawl efficiency by age. This resulted in a difference in the proportion at age compared to what is used in the model. Stan also explained that pollock behave differently when they are in schools than when they are dispersed.

The present index underestimates the biomass peaks compared to the corrected peaks. The new index accounts for bottom trawl uncertainty in efficiency, and so raises the CV of the estimates. This increase in

CV is not consistent across years. The Team discussed why downweighting the survey by including covariance causes an increase in recent SSB values. Stan suggested that it was because other data sources must suggest more of an uptrend than the survey.

The Plan Team recommended that a model using the adjusted survey time series be included in November and commended Jim and Stan for their work on trawl survey efficiency.

Eastern Bering Sea Pacific cod

Grant Thompson reported the candidate preliminary models for the November 2013 EBS Pacific cod assessment. As has become routine in recent years, the Team and the SSC at their respective May/June meetings identified which candidate models they wanted to see at their respective September/October meetings. One candidate was last year's Model 1, which was the basis for harvest specification in 2011 (for 2012) and 2012 (for 2013). The important features of this model are:

(i) M fixed at 0.34.

(ii) Length-specific commercial selectivities for all fisheries, some forced to be asymptotic, estimated for blocks of years.

(iii) Age-specific survey selectivity with annually varying left limb.

(iv) Survey catchability fixed at the value obtained in the 2009 assessment (0.77), where it resulted in the product of catchability and selectivity at 60-81 cm equal (on average) to the desired value of 0.47 in the EBS. The desired value was based on a small number (11) of archival tags.

(v) A single growth schedule estimated for all years.

(vi) Intercept and slope of age reading bias estimated internally.

(vii) Standard deviation of length at age estimated internally.

(viii) Mean length at age data left out of the fit.

(ix) All age and length composition data included in the fit.

In the 2012 assessment cycle the authors had reported on a new model, and then called Model 4, that had a number of attractive features, but was not ready for production use for the 2012 assessment. All of the candidate models requested by the Team and SSC were variants of this model, which differs from Model 1 in the following important ways:

(i) Time-varying length-weight relationship.

(ii) 10 (rather than 3) initial abundances at age estimated.

(iii) Richards (4-parameter) growth curve.

(iv) σ_R estimated freely.

(v) Length-specific survey selectivity.

(vi) Fishery selectivities estimated for five seasons but not by gear; one season's selectivity forced to be asymptotic.

(vii) Input catch composition sample sizes tuned to be no greater than output effective sample sizes.

(viii) 2 (rather than 1) survey selectivity parameters have annual devs.

(ix) Survey catchability estimated (rather than fixed at 0.77).

For this meeting, the Team and SSC requested two variants of this model:

- Model 2: Model 4 with survey Q estimated freely (product of Q and selectivity at 60-81 cm not required to equal 0.47).
- Model 3: Model 4 with asymptotic survey selectivity and Q estimated with a prior centered (approximately) on 0.47.

In addition the author reported fits from last year's exploratory Model 4, in which the product of survey Q and selectivity at 60-81 cm is required to be 0.47 as in Model 1. So the models considered at this meeting were Model 1(last year's standard), and Models 2, 3, and 4.

The free estimate of survey catchability in Model 2 was Q=1.37. The different model fits produced very different abundance estimates. Models 2 and 3 fitted the survey data somewhat better but still poorly. The different models' fits to the survey and commercial catch composition data were similar. Models 2 and 3 produced very high, and very unlikely, estimates of F in 1977 (ca. 3). Models 1, 2, and 4 produced similar estimates of dome-shaped survey selectivity. (In Model 3 survey selectivity was forced asymptotic.)

In his commentary on the models, Grant stated (as he has before) that it is simply not possible to fit the survey abundance estimates with a constant survey Q. He also noted that the prior on Q in Model 3 has no effect on the (high) estimate of Q in that model, and that the very high estimates of survey Q in Models 2 and 3 are quite precise. Looking ahead, he suggested that helpful changes in the model could include estimating empirical (random walk) selectivity schedules as in this year's preliminary Aleutian Islands assessment and dropping the seasonal breakdown of fishery data.

In the Team discussion, Dana Hanselman observed that the very low abundances (and very high F's) estimated by Models 2 and 3 in the late 1970s were very unlikely and not supported by much data. He suggested fixing the regime change effect parameter at zero in those models. The Team discussed all of the issues presented by this assessment, and considered the possibility that Model 1 would no longer be credible in November in view of the mounting evidence against the hypothesis based on archival tags that the average product of survey catchability and selectivity across the 60-81 cm size range is 0.47.

In the end, the Team recommended the following candidate models for the November meeting, intended to provide a number of alternatives to the present standard Model 1:

(i) Model 1: the standard for the last two years.

(ii) Model 2a: Model 2 from the September meeting, with fixed M and freely estimated survey Q.

(iii) Model 2b: Model 2 from the September meeting, with fixed M but annually varying survey Q (mean value and dev vector estimated freely).

(iv) Model 3a: Model 3 from the September meeting, with asymptotic survey selectivity and a prior on survey Q.

(v) Model 3b: Like Model 3a but with M estimated.

(vi) Model 4: Same as last year's Model 4.

The Team recommended that the author feel free to apply the iterative tuning procedures to Model 4 only, and use the values of the iteratively tuned quantities from Model 4 for the remaining models (other than Model 1) because all of the models other than Model 1 involve labor-intensive iterative tuning, and given that all of these iteratively tuned models are based to some extent on Model 4.

The Team also encouraged the author to bring forward a model using empirical (random walk) selectivity schedules similar to those in the preliminary Aleutian Islands assessment if the convergence problems with the (attempted, but not presented) EBS version of that model are resolved.

Aleutian Islands Pacific cod

This is a new assessment, prompted by the SSC's statement of intent to set a separate ABC and OFL for this stock beginning in 2014. All of the preliminary assessments presented in 2012 had one or another undesirable feature, and the Team and SSC at their respective meetings in May/June 2013 had basically given the authors a free hand to develop a credible assessment for this region.

Grant Thompson reported on three preliminary models, all new and all sharing a new parameterization of fishery and survey selectivity (SS selectivity pattern 17). In this scheme a separate (log) selectivity is estimated empirically for each age, but the estimates are required to change from age to age more or less smoothly by a set of priors on first differences, similar to the penalties on second differences used in some other assessments. Other common features of the models are:

(i) Survey data before 1991 were excluded because of intractable problems with the gear and stations fished in those years.

(ii) A single fishery and season.

(iii) Models fitted to survey biomass and fishery/survey length compositions only. (There are no age data for AI cod.)

(iv) Von Bertalanffy growth parameters and standard deviations of length at age estimated internally.

The three versions of the new model were:

1. M fixed at 0.34 as in the Bering Sea, survey catchability Q tuned so that the product of Q and selectivity in the 60-81 cm size range equals 0.92 (as in previous assessments of cod in the GOA, where the same survey net is used).
2. M fixed at 0.34, Q estimated with a normal prior on log Q centered at 0 (Q=1) with a standard deviation of 0.11.
3. Both M and Q estimated freely.

The estimates of Q from Models 1-3 were 1.33, 0.65, and 0.07, with a corresponding wide range of abundance estimates (2012 spawning biomass = 60,000 to over 1 million mt). All of the models estimated similar asymptotic fishery selectivity and similar domed survey selectivity with a questionable very sharp peak around 4 yr. All of the models fitted the length compositions reasonably well, but only Model 3 fitted the survey abundance data well.

Grant summarized the problems and issues presented by the preliminary models, including the very poorly determined value of Q in Model 3, the very noisy survey data, the dubious estimate of survey selectivity, and the poor correlation with estimated year-class strengths in the Bering Sea.

The Team dismissed Model 3 as impossible because of the very low estimate of Q (and very high estimate of biomass). In view of the poor prospects for estimating Q freely, the Team requested for November two candidate models with Q fixed at 1 or estimated with a prior centered on 1 as in Model 2. The idea here would be to use the available data to estimate selectivities, stock trends and reference points as in a Tier 3 assessment but with a fixed Q as in a Tier 5 assessment.

Specifically, the Team recommended two models:

1. **M fixed, Q fixed at 1, freely estimated selectivities.**
2. **M fixed, Q estimated with a prior as in Model 2, survey selectivity forced to be asymptotic.**

Atka mackerel selectivity

Jim Ianelli presented background information on how selectivity is modeled for BSAI Atka mackerel. The 2012 assessment model evaluated sensitivity to the degree of "dome-shapedness." More recently, an evaluation of sensitivity to time-varying selectivity has been considered since the present approach is to use "time blocks" based on a past CIE review recommendations. A problem with the time-varying

approach is with objectively specifying how much variability to allow (since a full random-effects approach is computationally prohibitive). Based on an analogous approach developed by Grant Thompson for determining the appropriate constraint for a time-varying parameter (e.g., as implemented for selectivity parameters in Model 4 of last year's BSAI Pacific cod assessment or for recruitment in the recruitment working group report), Jim generalized the method to address time and age variability simultaneously. While some information in this assessment is highly uncertain (namely the survey biomass estimates), the catch-at-age data from the fishery are well sampled and appear to be consistent from year to year. Jim also presented a novel approach that reduces the number of selectivity parameters by having one age-specific vector (14 terms) and one cohort-specific vector (35 terms). The Team discussed that this presupposes that selectivity is a function (partially) of year-class and may serve to reflect the fishery tendency to focus on strong year-classes (which would have higher CPUEs).

The Team recommended that the authors include the base model approach (with a subjective constraint on the degree of dome shape) and the authors' proposed (more objective) approach to specifying the penalty terms for time- and age-varying selectivity.

Forage fish

Olav Ormseth provided an overview of the development of a forage fish report for the BSAI, as requested by the SSC. The format will follow the GOA forage fish chapter, and will be an appendix to the BSAI SAFE report on a biennial basis. The report will be included in the "off" survey years when several non-target stocks have only an update rather than a full assessment (odd years for the BSAI forage fish report, even years for the GOA forage fish report).

In 1998, Amendment 36 to the BSAI FMP and Amendment 39 to the GOA FMP created a forage fish species category to prevent development of a commercial directed fishery for forage fish, which are a critical food source for many marine mammal, seabird, and fish species. These amendments prohibited directed fishing, established a 2 percent maximum retainable bycatch amount, and limited processing is to fish meal only. In 2011, under the ACL amendments, forage fish were moved into the Ecosystem Component category of the FMPs, along with PSC species. Forage fish species are defined in the FMP and 50 CFR 679 regulations as Osmeridae (eulachon, capelin, and other smelts), Myctophidae (lanternfishes), Bathylagidae (deep-sea smelts), Ammodytidae (Pacific sand lance), Trichodontidae (Pacific sand fish), Pholidae (gunnels), Stichaeidae (pricklebacks, warbonnets, eel blennys, cockscombs, and shannys), Gonostomatidae (bristlemouths, lightfishes, and anglemouths), and the Order Euphausiacea (krill). These species have been grouped together because they are considered to be primary food resources for marine animals and they have the potential to be the targets of a commercial fishery.

Some overlap may occur between this report and the Ecosystems Considerations chapter; however, the forage fish chapter will focus on species populations, stock assessments, and bycatch. The Ecosystem Considerations chapter will focus on ecosystem indicators. Olav is working closely with Stephani Zador to coordinate the two reports. Forage fish data are somewhat lacking, as the trawl surveys are not a reliable estimate of biomass, since few species are demersal or benthic. Olav is looking for other sources of information, including predators as a survey tool.

The Team recommended that the author also examine the longline and IPHC surveys as possible sources of data on forage fish.

The report contains 5 sections: recent developments, management, distribution and abundance, bycatch, and monitoring. Recent developments reflect an increased commercial interest in forage fish and include the 2010 listing of eulachon as threatened for the West Coast and southern B.C., the Lenfest report (the most comprehensive global analysis of forage fish management to date), and the MACE euphausiids index. For management information, the report also discusses species not in the forage fish category, including herring (which is in the FMP as a prohibited species); juvenile groundfish; and salmon, shrimps, squids, and Arctic cod. For the distribution and abundance section, Olav is developing several

ways to provide information, including maps using RACEbase showing 2000-2011 shelf and slope trawl surveys with 20 km squares and mean CPUE. Several years were used because of the unreliability of any one year of survey data.

The Team recommended that the author consider whether and how the Bering Sea cold pool could change distribution for some species.

For the bycatch section, Olav discussed the recent improvement of species identification, and stated that eulachon are the only FMP forage fish species caught in large numbers as commercial fishery bycatch. In some years, forage fish as bycatch in the pollock fishery landings to Kodiak processors have exceeded the 2 percent retention limit. In 2012, herring PSC in the Bering Sea pollock fishery exceeded the PSC limit and NMFS closed the winter herring savings area for the pollock directed fishery from October 1 to March 1, 2013. In the monitoring section, Olav presented time series of CPUE in the bottom trawl and BASIS surveys and noted that, although the surveys are not very reliable samplers of forage fishes, both surveys suggest an increasing trend in capelin abundance over the last 3-4 years. For other species, e.g. sandfish, CPUE estimates are so uncertain that the time series have little meaning. Olav is working to identify other sources of information to inform the discussion of distribution and abundance in future reports.

The Team recommended that the author work with the assessment authors so that a summary of forage fish chapter information be incorporated into each assessment's ecosystem section.

BSAI Reallocations above the TAC

Mary Furuness presented a summary of the allocation of BSAI non-specified reserves for 2012 and 2013. NOAA determines when the non-specified reserve could be allocated to the different species TACs that contribute to the non-specified reserve above their original TAC (but below the ABC). Details on the non-specified reserves for each species are available on the NMFS Alaska Region's website in the Harvest Specifications tables http://alaskafisheries.noaa.gov/sustainablefisheries/specs13_14/.

In 2012, other flatfish, sculpins, and squids were reallocated from non-specified reserves over their original TACs. In 2013, some of the non-specified reserves may be used to reallocate over the original TAC from some species. The species have not been determined, but may include sharks, Alaska plaice, or arrowtooth flounder. Through another process in regulations, unused Aleutian Islands Aleut Corporation pollock is reallocated to AFA directed fisheries and AI CDQ pollock is reallocated to BS CDQ pollock. This may occur when the AI directed fisheries are determined to be unable to harvest pollock in the AI and there is a sufficient buffer between BS pollock TAC and ABC to allow for the reallocations.

The Plan Team recommended that NMFS Alaska Region develop a consistent process to ensure that these changes in TAC are communicated to stock assessment authors.

BSAI arrowtooth flounder maturity

Ingrid Spies presented a new arrowtooth flounder maturity study (Stark 2011). Samples totaling 175 specimens were taken from Unimak (as opposed to Kodiak for the previous study). In the new study, fish matured at slightly older ages. The results give lower female SSB (~1/3 lower in the most recent year), and a very slight change in total biomass (due to an effect of the stock-recruitment relationship).

The Team recommended that the author use the new maturity schedule in the assessment.

Northern rock sole temperature-catchability model

There were 7 northern rock sole models presented in last year's assessment. Last year both the Team and SSC recommended that the author not use the new models, but instead recommended that the author bring back a temperature-dependent catchability model this year. A new catchability model presented by Tom Wilderbuer has very similar results to the base model. A strong prior is used to constrain the estimate of q

based on a trawl-herding experiment. Overall, there is a 3% reduction in the absolute value of the residuals from the base model. The model fits the survey sex ratio. AIC indicates improvement (AIC difference of 4.7, 91% chance of being the better model by Akaike weights).

Agreeing with the author, the Team recommended that the temperature-dependent catchability model be included in November. Unless new information to the contrary arises between now and November, the Team is likely to base harvest recommendations for 2014 on the model with temperature-dependent catchability.

Kamchatka flounder

Tom Wilderbuer presented a proposed Tier 3 assessment of Kamchatka flounder, which was updated from the assessment presented last September. Reliable identification of this species in the surveys began in 1991, and in the fishery, in 2007. The data available for the assessment are mainly the biomass estimates and length compositions from the shelf, slope and Aleutian Islands trawl surveys.

Different population components occupy the three areas, with juveniles distributed mainly on the shelf and larger fish on the slope and in the Aleutian Islands. To account for that, and for the asynchrony of the surveys, the model estimates separate survey catchabilities and selectivities for each survey. Natural mortality M=0.11 was estimated by profiling. The model achieves very acceptable fits to all three sets of survey data.

The Team commended the author on successfully implementing this method for addressing disparate survey data sets and recommended use of this model in the November assessment.

Spatial Management Case Studies

The Team reviewed application of the stock structure template to three BSAI groundfish stocks: shortraker rockfish, Aleutian Islands pollock, and the blackspotted/rougheye rockfish assemblage. The Team referenced its earlier discussion with the GOA Plan Team (see joint Team minutes) to guide its reviews. The Team identified issues regarding stock structure, and raised concerns where appropriate, while awaiting future guidance on the Council's future spatial management policy. The following stocks provide good examples for Council consideration of the range of cases to which the future policy and process would need to apply: 1) *monitor* (no concern at this time due to other fishery constraints): AI pollock; 2) *alert*: shortraker rockfish; and 3) *concern*: blackspotted/ rougheye rockfishes. Under the status quo process for spatial management, the BSAI Team may have recommended subarea splits for the latter assemblage; but, due to the pending development of new Council policy for spatial management of all stocks, the Team only recorded its evaluations of stock structure and its concerns regarding status quo management. The Team awaits policy guidance, but notes the need for clear direction on how to proceed, including cases for which limitations on data or other resources do not permit determination of concern (or lack thereof).

The Team recommended continuing to request stock structure templates in the BSAI and the GOA until there is a relatively complete set of stocks to compare. For September 2014, the Team recommended that the assessment authors for EBS pollock, BSAI arrowtooth flounder, and BSAI flathead sole complete the stock structure templates.

Shortraker Rockfish Stock Structure

Paul Spencer presented information applying the stock structure template to shortraker rockfish. The presentation included spatial harvest patterns, oceanographic characteristics, differences in growth and age/size structure, and genetic information. The region was divided into five areas: the western Aleutian Islands (WAI), the central Aleutian Islands (CAI), the eastern Aleutian Islands (EAI), the southern Bering Sea (SBS), and the eastern Bering Sea (EBS).

Annual exploitation rates (calculated as the ratio of catch to survey biomass) from 2004 to the present for shortraker rockfish in each of the five areas showed rates above 0.75*M for recent years in the EBS, SBS, and WAI. Biomass estimates from a random effects model were highly variable but generally stable for all but the SBS, which was decreasing, and the EBS slope, which was increasing. Catch of shortraker rockfish in the WAI has increased disproportionately since 2010. The existence of deep passes and strong currents in the Aleutian Islands likely provide effective barriers to the migration of individuals of this species from one area to the next. This isolation makes it possible for local stocks to be exploited with limited replenishment from adjoining areas. In addition to geographic isolation there exist significant differences in size-at-age between WAI/CAI and SBS with intermediate size-at-age for EAI. It was noted that age readings of shortraker rockfish otoliths are problematic. Results of microsatellite DNA analyses published in 2004 indicated significant within-group genetic differentiation for shortraker rockfish samples from SE Alaska to the WAI, but there are little detailed data for the BSAI region.

The Plan Team recommended alerting the Council of the status of shortraker rockfish as the Council develops its spatial management policy and procedure.

The Team wished to alert the Council about overharvesting isolated stocks and the possible loss of productivity of local populations that are part of a larger stock. It was also suggested by the Team and industry representatives that it may be possible to mitigate localized reductions by altering fishing practices to decrease harvest on stocks of concern. The Team agreed that, due to limited and uncertain data, evaluating TAC overages against a five-year moving average of harvest and exploitation rates may better indicate whether there is sufficient rationale to take action.

AI Pollock Stock Structure

Steve Barbeaux showed an overview of walleye pollock stock structure that examined the EBS, AI, and GOA. He showed recruitment and abundance trends for the three areas. The AI is more related to the GOA than the BS for these quantities.

Meristics and morphology According to several studies, the AI has differences in meristics and morphologies than the other regions, based on some small samples from Adak. They were generally bigger, deeper bodied, with larger heads and more vertebrae.

Size –at –age differences exist in the trawl survey data AI and GOA pollock stocks were very similar, but the BS fish were generally smaller. Fish size was related to bottom temperature. AI pollock start out larger as one-year olds, but growth is about the same after age 5. Growth was faster at lower latitudes (following temperature trend). Steve showed maps of size-at-age anomalies by age-group. For example, the largest age-9 fish are in the inner BS domain. He looked at subareas within the AI and saw no substantial differences. EBS might have faster growth of age-2 pollock. Steve suspects that age 1 fish move, but older fish do not.

Several genetic studies have shown a mild genetic distinction between Adak Island and other areas. One study showed a genetic cline across the North Pacific. Bering basin pollock are different from fish on the southern side of the Aleutian Islands according to meristics/morphometrics.

In terms of catch, the fishery declined starting in 1997. The fishermen moved west and, by 1999, the fishery was closed. Most of the catch now only occurs during surveys, and recently in the arrowtooth flounder fishery. Catch from 2007-2011 averaged around 1,600 mt per year.

The Team asked what happens to the eggs from the spawning aggregations. Steve suggested that a lot may end up in the deep ocean, but others may get entrained into bays. The Team noted that if an egg's only options are staying in a local bay or getting lost in the deep ocean, then wiping out a local spawning aggregation implies that it may be a long time before the aggregation is replaced. There is less concern now regarding serial depletion given the small amount of current fishing pressure.

Mary Furuness suggested it is possible that fishery mortality could rise as bycatch from other fisheries in the future. Noting that all year classes since 1989 have been below average, the Team discussed that this potential erosion of productivity is an example of concerns that might precipitate spatial management.

A Team member asked whether the lack of good recruitment over the last two decades is because of subarea overharvesting. Another Team member asked whether, given that the 1978 year class was more than five times stronger than the next largest year class in the time series, the reductions in spawning biomass and recruitment that have been observed since the mid-1980s might be due more to the disappearance of this singularly large year class than to serial depletion. Others suggested that maybe there has been a slow, environmentally driven, decline in recruitment magnitude. Steve also suggested that Pacific ocean perch may have taken over pollock's ecological niche because they have increased from about $B_{10\%}$ to $B_{60\%}$ since the stock declined.

The Team asked whether Steve thought there was sufficient concern for AI pollock to alert the Council for consideration for spatial management. Steve said that he would be concerned only if a fishery were to develop, but not if it remains a bycatch species. The stock is at B33% and stable.

The Team commended Steve for an excellent analysis and recommended revisiting the analysis if fishing mortality increases.

Blackspotted/Rougheye Rockfishes Stock Structure

Paul Spencer reported consistent high bycatch of blackspotted/rougheye rockfish complex in directed commercial trawl fisheries that would amount to overages of the potential ABC in the western Aleutian Islands (WAI), if spatial management had previously been implemented for the assemblage. Although blackspotted/rougheye rockfish are managed in a two-species complex in the BSAI, rougheye rockfish are rarely found west of the eastern Aleutians; thus, the concern in the WAI pertains to blackspotted rockfish.

The Team found the quantity and quality of the information presented to be compelling and commended the author for compiling the information to document concerns regarding status quo management of the assemblage.

The Team concurred with the author's conclusions (as revised below) that the species has been reduced in the WAI.

1) Genetic information showing spatial structure at scales < 500 km, which is roughly the scale of one of AI subareas.

2) High catch levels in the 1990s in the WAI that were followed by a sharp decline in WAI survey biomass estimates.

3) Estimated exploitation rates have exceed $U_{F35\%}$ (the exploitation rate that would result from applying a fishing rate of $F_{35\%}$ to the estimated beginning-year numbers at age) in 6 out of 10 years in the WAI from 2004-2013.

4) Overall, an 85% decline in survey biomass estimates in the WAI from 1991-2012, as estimated by a random effects time series model.

5) An increase in the proportion of survey tows which have not caught blackspotted/rougheye in the WAI, and within each WAI survey stratum deeper than 100 m.

6) A large percentage of the total harvest occurring in the WAI.

7) A decline in mean size in the WAI but not in other BSAI subareas.

The Team has more concern over local overexploitation of this assemblage than other stocks that have been subjected to the stock structure template. The Team recommended that the Council consider this information under its proposed spatial management policy.

The Team awaits further direction from the Council for next steps under its proposed process for addressing spatial management concerns for this assemblage. It will continue to monitor the status of the stock in the current context.

2014/2015 Harvest Specification Recommendations

The Team recommended proposed 2014 BSAI OFLs and ABCs that were published in the Federal Register last year for the purpose of notifying the public of potential final specifications, except for two cases:

- For Pacific cod, separate BS and AI specifications were recommended. For the EBS, the Team used 93 percent of the combined 2014 BSAI OFL and ABC published last year. For the AI, the Team used Tier 5 estimates from last year's preliminary assessment, noting that it will review a revised model in November 2013.
- The proposed 2014 OFL and ABC for Kamchatka flounder were obtained from the assessment author, using results from the preliminary Tier 3 assessment that was approved for use in November by the Team.

The Team recommended 2015 OFLs and ABCs set equal to the 2014 values. See attachment.

Adjourn

The meeting adjourned at approximately 3 pm.

Minutes

Gulf of Alaska Groundfish Plan Team

September 12 - 13 2013

North Pacific Fishery Management Council
605 W 4th Avenue, Suite 306
Anchorage, AK 99501

Diana Stram	NPFMC (co-chair)	Jim Ianelli	AFSC REFM (co-chair)
Sandra Lowe	AFSC REFM	Paul Spencer	AFSC REFM
Chris Lunsford	AFSC ABL	Leslie Slater*	USFWS
Jon Heifetz	AFSC ABL	Nancy Friday	AFSC NMML
Mike Dalton	AFSC REFM	Craig Faunce	AFSC FMA
Kristen Green	ADF&G	Jan Rumble	ADF&G
Obren Davis	NMFS AKRO Kodiak	Mark Stichert	ADF&G
		Ian Stewart	IPHC

* Absent

GOA Pollock

Martin Dorn presented the author (AFSC) response to the CIE review of the Gulf of Alaska Stock Assessment. The Review was conducted in July 2012. The response is focused on prioritizing analytical work over the next 3-5 years.

The reviewers had assembled a comprehensive list of 21 specific recommendations for future research to support the GOA pollock assessment that was not constrained by time or resources. There were several themes to these recommendations. Several items have already been addressed in the 2012 stock assessment model, including removing the egg production index and the early 1980s cooperative trawl surveys from the model, modeling fishery selectivity as varying between six time blocks rather than annually varying with a random walk, adding age 1 to the model, and stronger equilibrium assumptions for initializing the model. In addition, the MACE group has addressed additional issues such as improved sampling procedures and analytical approaches for allocating backscatter to length modes in the Shelikof Strait acoustic survey, and accounting for juvenile escapement in the estimates of biomass and size composition for the Shelikof Strait acoustic survey. The MACE Program explicitly addressed the CIE Reviewers recommendations related to the acoustic-trawl survey issues in Appendix 3 of the AFSC written response (available upon request).

The Team recommended that the author prioritize for the next year an investigation of the relative weightings given to different data sets. Additional short-term priorities include estimation of bottom trawl catchability (potentially with a prior distribution), evaluation of fishery and selectivity functional forms (i.e., asymptotic vs dome-shaped), and evaluation of methods for modeling time-varying selectivity.

Addressing some CIE recommendations such as incorporation of predation mortality into the model, and developing a Stock Synthesis version of the model to compare with the current version, are longer-term research goals.

Some of the CIE recommendations are general issues that apply to other North Pacific assessments. For example, investigation of whether the cooperative trawl surveys from the 1980s should be removed from assessments (because of differences in methodology with subsequent NMFS surveys) is a general issue that may affect other GOA species as well. Also, that author has begun to investigate GLM modeling of trawl survey data, and this approach may be applicable to other assessment as well.

With observer coverage changes in 2013, the question was asked whether the author had noted a substantial and harmful decrease in biological samples this year compared to 2012. The author replied that he would be looking into the issue and making any necessary requests for changes in sampling rates to the observer program in the coming weeks.

Winter and Summer Acoustic Survey Update

The Team also heard a presentation by Darin Jones on the summer GOA acoustic trawl survey conducted during June-Aug 2013. The survey area extended from the Island of Four Mountains (~170 W) to Yakutat Trough (~141 W). Preliminary analyses of the data suggest that it will likely be possible to provide abundance estimates for pollock, capelin, and Pacific Ocean perch based on the acoustics and trawl information, although estimates are not yet available. Adult as well as age-1 pollock were distributed throughout much of the surveyed area. Substantial backscatter often distributed along the shelf break was attributed to Pacific Ocean Perch (POP). The Team discussed whether and how these data might be used in the assessment of that species. The Team encouraged assessment staff to discuss this issue with the Rockfish Working Group members, with particular attention given to difficulties in sampling suspected POP backscatter with bottom trawls.

The Team was shown the results of several midwater trawl selectivity experiments conducted during the March Shelikof Strait pre-spawning pollock surveys. Results show that age-1 pollock are under-retained by the trawl, with this effect being strongest in 2007 and less pronounced in experiments from 2008 and 2013. Revised abundance estimates based on applying a selectivity correction to the acoustic survey time series would reduce the total biomass and would also affect the age compositions in the survey as well, specifically increasing the abundance estimates for the age 1s. In addition, variability in the retention estimates strongly influence the uncertainty of the survey estimates.

The Team commended the acoustic group for their comparative work on selectivity.

In addition, it was noted by the author that the Euphausiid index for the summer survey was of particular interest and should be continued. This index would be useful addition to the Ecosystem chapter as a productivity index for the GOA.

2013 GOA Bottom Trawl Survey

Wayne Palsson provided a preliminary summary of the 2013 GOA bottom trawl survey. The presentation primarily focused on characteristics of the survey as they relate to how data is applied. Chartered vessels for 2013 were the F/V Seastorm an*d F/V Alaska Provider*. Wayne noted compilation of the data is ongoing and results will be provided to assessment authors and other programs by late September.

The entire GOA survey area was sampled in 2013 but depth coverage was limited. A combined 550 stations were surveyed over 75 days. Notable aspects from the survey included responding to reduced funding, a new charter vessel, implementation of new wheelhouse software, and net mensuration sensors. Similar to 2011 only two charter vessels were funded for the 2013 survey. Reduced effort resulted in fewer stations surveyed. Stations in the 700-1000 meter depth stratum were not surveyed based on input from assessment authors in order to maintain coverage across all regions. Reduced/late funding also resulted in limited response to the charter bid request. The Plan Team discussed options for responding to uncertainty in funding and concluded additional market research and collaboration with industry may assist with future charter contacting.

The Plan Team recommended returning to a three vessel GOA bottom trawl survey to maintain survey precision.

The Alaska Provider was a new charter vessel used for the 2013 survey. It was the larger of the two vessels and primarily concentrated on offshore stations. A new wheelhouse program was used on both vessels. The program modernizes data collection and database integration, increases QA/QC capability, provides the ability to email data at sea, and improves back deck data streams. New Marport net sensors were also deployed to replace aging units and provide better diagnostics to detect trawl equilibrium and fishing condition. The Plan Team noted determining the amount of catch before trawl equilibrium is important for assessment and encouraged continued coordination between the assessment and survey programs to better document and compare changes in sensor equipment.

Rock soles

Stock assessments for aggregate, northern and southern rock soles using the 2012 model and Stock Synthesis (SS) were summarized by Teresa A'mar. She made the general observation that low fishing pressure appears to provide poor information/signal in the data and poor ability to select among model configurations. A number of changes were under consideration including S-R curves, growth and selectivity treatment, sex/species ratios and alternate model platforms (SS). Data through 2012 was used for all comparisons. Alternate models using the 2012 and SS platforms compared the effects of growth and male M estimation.

For the 2012 alternatives, trends were generally similar among alternate models, although the scale did vary, more due to mortality than growth. For species-specific SS models, 60% of catch estimate applied to each of the two species models. There was some discussion about observations of species ratios in the observer data and in processing plants. Early species composition information is not available, but for more recent years the observer program may be able to help apply the species composition ratios to the haul-level data.

SS model results for aggregate rock sole differed from last year's results in trend, but less so in magnitude. Northern rock sole SS models showed differing magnitudes from 2012, but similar trends. Fits to survey indices were poor and worse than last year. There was general concern that the models should be fitting the survey index better, although it was more difficult to diagnose without seeing the uncertainty estimates for the individual observations. Simpler models that fit the survey better seemed to be warranted, given the relatively poor information content of the underlying data. Southern rock sole SS models differed in magnitude from last year but had similar trends, and similar fits to survey index. It was noted that a primary benefit of the aggregate models was the ability to use the longer time-series of data (to 1980s).

Teresa posed several questions for the Plan Team: Should male M be estimated? Should the SS models continue to be developed? Should an aggregate approach or species-specific models be brought forward?

After considerable discussion, the Plan Team recommended several steps to try to simplify the analysis for November:

1. **Work with the observer program to delineate catch data based on sexed rock sole for years where this is possible (total catch should sum to the estimated total for shallow water flatfish);**
2. **Continue to develop the SS models for aggregate, northern and southern species;**
3. **Investigate the empirical growth (input weight-at-age) approach for these models and generally simplifying the models given the uncertainties in the available data;**
4. **Investigate the data weighting generally following the approach included in Grant Thompson's 'reliable' Fmsy bullets, and particularly try to find a model/data configuration that favors an improved fit to the survey index of abundance;**
5. **Find a method for ABC calculation for the aggregate and separate species models that will allow for a combined ABC recognizing the range of potential species percentages in the catch (likely reflecting previously observed values).**

As time permits, the Plan Team generally recommended likelihood profiles over M, derivation of a prior probability distribution and also comparison of plausible values with similar flatfish species as a way to investigate the ability to estimate this parameter. Reporting the total likelihoods when tabling the components would be helpful for investigation of the results.

Dover sole and flathead sole model alternatives

Carey McGilliard presented work to transition from earlier models for these stocks.

It was noted the Buck Stockhausen had been transferred to work on crab assessments and Carey would be assuming the responsibilities to do these flatfish assessments. She noted the advantages of stock synthesis (SS) to accommodate a majority of the past issues raised by the SSC and Plan Team. There were a number of improvements and pointed out the complications of matching the 2011 model with what was possible in stock synthesis. She presented 5 alternative models (but examined a number of others) as progressions from the transitional model.

The flathead sole SS model was able to match the 2011 model reasonably well but the ability to match the 2011 model for Dover sole was more difficult (mainly due to the way data are treated within SS). The Team accepted the attribution of these differences and commended the author for presenting a complete summary of some complex evaluations.

The Team recommended that the author continue to use the stock synthesis framework for both species since it can accommodate past issues that have been raised. Also fits to the survey index data were much better.

Some details regarding model configurations where initial fishing mortality is estimated (to acknowledge that fishing is likely to have occurred prior to 1984) were presented and considered reasonable.

The Team suggested that the SSC consider ensuring that maturity studies are listed as a research priority since there are large differences between studies from various regions. Also the author

should confer with the age and growth folks at the AFSC regarding the Abookire et al 2003 paper and compare what's being done in BC and the lower 48 assessments for this stock.

Regarding the expansion approach, the Team accepted that the same method that was used in the past was okay. However, it may be appropriate to use the survey smoothing approach (see Survey Working group report) for "filling in" missing years and depths at the strata level. Also, if the expansion of the data are used, the uncertainty as specified by the assumed variance should be inflated. Perhaps the smoothing model can provide an objective estimate.

From examinations of Dover sole biomass estimates deeper than 700m, it appears (except for the 1984 survey) that about 2% of the biomass is deeper that 700m and 10% deeper than 500m. The Team suggested that the author evaluate how best to treat these missing survey segments and consider the apparent ontogenetic changes in distribution with depth.

The Team recommended that the author ignore the composition data for the survey years which had incomplete coverage (i.e., when the SE GOA or deeper strata were omitted) and inflate the variance estimates for the expanded biomass indices. The Team recommended that authors of deep-water species work together to find a consistent method for treatment of survey years where coverage was incomplete.

As noted in some CIE reports, the application of a GLM approach for survey analysis should be developed and be a research priority.

GOA Pacific cod

Teresa A'mar presented a preliminary evaluation of results from several different configurations of the GOA Pacific cod stock assessment model to address comments from the SSC and Plan Teams regarding i) data for mean weight at age in the 27cm+ group, ii) fishery selectivities, iii) fitting to survey length vs age, iv) high variability within the 27cm- group.

Items i) and iii) are discussed below. To partly address item ii), a set of models used less restrictive starting values and more parameters were estimated. In general, model estimates of selectivity parameters are sensitive to starting values, which is an ongoing concern. The Team agreed that the selectivity component of the model is overparameterized. To address item iv), the 27cm- was split into two groups.

The Team recommended that the effects of parameter bounds continue to be explored for convergence-related issues.

This should include which phases the parameters are estimated in. Additionally, a downward adjustment of the first reference age in the growth model (amin) was suggested for exploration to avoid the linear extrapolation of length-at-age below this value.

The Team recommended including confidence intervals for plotted data points.

The Team recommended tuning input sample sizes by fleet to harmonic mean effective sample sizes, and checking that input variances are consistent with model results.

Fits to survey age and size data is major difference in the summary of likelihood components. An alternative error structure may help to model survey variances and address extreme catch events such

as occurred in the 2009 survey. The Team observed that the likelihood component for mean weight-at-age is causing problems and was skeptical that a growth curve can be reliably fit to these data. Growth is not estimated in model 6 and parameters for the growth curve come from outside this model.

The Team recommended going forward with 2011 model 3, possibly with the 27- split into three groups and versions of 2012 model 6 where growth is fixed. In particular, the Team recommended two additional variations of model 6: Model 6b would use the growth parameters assumed in model 6 and include empirical weights-at-age. Model 6c would resemble model 7 by excluding age composition data, and fit to length data only, but unlike model 7, model 6c would not estimate growth parameters.

The Team recommended (but not necessarily by November) coordinating with ADFG to examine (age, length, maturity) data from the GHL fishery.

Otoliths from Prince William Sound and Cook Inlet cod fisheries have been collected but not aged. The Team recommended determining how much catch occurred in these areas and coordinating with ADFG to analyze these data.

The Team recommended that explorations of sex specific models be postponed unless time permits.

GOA demersal shelf rockfish

Kristen Green presented information about the Remote Operated Vehicle (ROV) demersal shelf rockfish survey and previous results from the Delta sub research surveys, as well as an update on the DSR ASA model. DSR surveys were historically conducted with a submersible, but it is not available anymore. The department has transitioned to using a ROV, owned and operated by ADF&G.

In 2012, ADF&G completed the first ROV survey in one management area. There were 46 transects completed in the Central Southeast Outside (CSEO) management area. Yelloweye rockfish were counted and measured. There were 118 yelloweye observed. Unlike the submersible, the ROV has a stereo camera set up instead of a single camera, and lengths of the fish can be obtained.

For the CSEO management area, the density estimate from 2012 is close to the previous estimate from the 2007 Delta sub survey in the same area. The CV from the 2012 ROV estimate is very similar to the last submersible survey in this area, approximately 12.5%.

The length distribution was different when comparing the ROV survey and commercial fishery sampling. There were questions from the panel about the reasons for this difference. There were smaller yelloweye rockfish observed in the ROV survey than the ones sampled in the commercial fishery; this is to be expected based on longline gear selectivity, but the histogram proportions are different in other length categories as well.

The second ROV survey was completed in August 2013 in Southern Southeast Outside (SSEO). There were 31 transects completed in the SSEO management area. There was hope that a subset of the 2012 CSEO dives could be sampled again to compare interannual densities of yelloweye rockfish in 2013, but this was not possible due to weather and other delays. The 2013 survey data will be analyzed this winter. For the next ROV survey in 2014, Eastern Yakutat (EYKT) management area will be covered, and NSEO and EYKT may be combined in the survey.

Kristen presented a table with historical yelloweye rockfish density results from the four management areas from 1994 to 2012 (the data available). Data from the different management areas ranges from two to six years of density data. The CVs for the density estimates have been between 10 and 30%.

The DSR ASA model is being updated by the new ADF&G biometrician Kray Van Kirk. It has been revised using Dave Carlile's previous work. These model results are pending and ADF&G is performing an internal review.

Kristen responded to Plan Team comments from last year. Comments included recommendations to use sportfish data as an index. She said this would be difficult since it is hard to identify angler effort. The Plan Team also asked how DFO Canada deals with multiple area surveys. DFO Canada rotates areas for their trawl and hook-and-line surveys. They use area specific indices and include the available survey years in their assessment model. The Plan Team also had questions about the way that average yelloweye weight data is used in the stock assessment. Last year the Plan Team recommended stratifying weight differences by area to evaluate how average weight differs by area. Kristen said they are in the process of looking into this, and also exploring differences between the ROV length data versus commercial length data.

Comments included analysis comparing the average weights versus size composition and ROV length data versus commercial length data. Kristen commented that there are there were four management areas with four average weights (one from each area) and they are then applied to their respective yelloweye rockfish density to obtain biomass.

The Team recommended that the authors look into differences between length frequencies from the ROV survey versus the commercial fishery. Are there discards from the commercial fishery that are not being accounted for, or is there another reason that length frequencies are different?

Questions were asked about the decreasing trend in the graph for the Central Southeast Outside management area and if it continues to decline.

The Plan Team requested details on what would be included in the November assessment. The author will provide an executive style summary SAFE chapter with an ABC recommendation based on the submersible density estimates and the one year of ROV density estimates.

Since so many of the area specific density estimates are based on dated survey data, the **Plan Team recommended that the authors provide time series estimates and smoothing as an option for the Plan Team for the November meeting (additional analysis).** The data could be run through the random effects model developed by the Teams' survey average working group.

The Plan Team recommended that the authors provide a draft SAFE to the Plan Team next September (2014) with the revised ASA model and 2012 and 2013 ROV survey data. The 2014 survey data will not be available for the September 2014 draft document, but may be available for the November 2014 meeting.

The Plan Team recommended that the authors also continue to look into the IPHC longline survey data as another index of yelloweye rockfish relative abundance to include into the ASA.

"Other rockfish" issues

Cindy Tribuzio provided an overview on the other rockfish complex. The Plan Team in 2012 requested the author to provide an examination of the survey and fishery catch for the demersal shelf rockfish (DSR) complex outside of the southeast management region and to investigate the potential explanations for the differences in catch of harlequin rockfish in the survey and fishery in the western Gulf.

The Other Rockfish complex (OR) is difficult to define and depends on region as certain species are broken out for the demersal shelf rockfish complex in the eastern Gulf. Currently, DSR species outside the eastern Gulf region are included in the OR catch but are not included in the assessment (i.e. biomass and ABC calculations are not included). Managing these species as a separate assessment is not recommended because of the low biomass levels and associated ABCs/OFLs. Creating a separate ABC would result in an ABC around 68t which could make inseason management more problematic as historical catch typically exceeds that amount. Therefore, the author suggested continuing to include the DSR species outside of the eastern Gulf region in the OR stock assessment including providing biomass, ABC/OFL, and catch information.

The Team agreed with the author and recommended that DSR remain in the Other Rockfish complex for areas outside of the eastern Gulf.

The second request was to examine the fishery catch records in more detail to determine which areas, species, and target fisheries are contributing to the higher catch levels of harlequin rockfish. The catch of OR in the western Gulf has been above ABC in recent years, mainly due to the large catches of harlequin rockfish in the fishery. Survey biomass of harlequin is low and has become an issue now that an extremely large biomass in the 2005 survey has been dropped from calculations. Harlequin rockfish are known to inhabit untrawlable areas and may not be sampled well by the bottom trawl survey. In addition, the fishery may be occurring in habitats the survey doesn't sample. A GIS examination of survey and fishery catch overlaid on the survey trawlable/untrawlable habitat grid was inconclusive, partially due to working with confidential data. Most harlequin are caught in the rockfish fishery, and harlequin are generally a minor component in an individual haul's (<2%) catch. The Team discussed whether or not the high catch of harlequin is a conservation concern but agreed it's not clear if the survey biomass estimates are accurate. Furthermore, the data is inadequate for comparing the survey and fishery catches. A comment was made that harlequins are not targeted by the fishery and in the 2013 fishery the industry attempted to reduce harlequin catch but the ABC was still exceeded. There is concern with this issue because OR are caught in numerous fisheries and when the ABC is exceeded retention is not allowed. Additionally, now that the halibut fleet is being observed due to observer restructuring, there may be an increase in OR catch reflected in catch accounting. The Team determined further examination of the trawlable/untrawlable habitat issue is not a priority because of the insufficiency of the available data and the differences between the survey and fishery fishing practices.

The Team recommended that for November the author apply the survey averaging technique for smoothing the survey biomass estimates in addition to the current method. Additionally, the Team recommended providing these estimates for individual management regions and estimates for the central and western management areas combined.

Further action was deemed unnecessary at this time based on the rationale that harlequin rockfish are known to be found on untrawlable ground and that this may explain the mis-match between fishery catches and what is observed in the fishery. Also, the survey biomass time series (in aggregate GOA-wide) appears to be stable.

Octopus and skates

At the June, 2013 meeting, the Council requested a discussion paper (from Council staff) for consideration at the October 2013 Council meeting on the potential for a directed fishery for octopus in the GOA. As part of that motion, the Council requested that stock assessment authors and the GOA Plan Team provide area-specific (EGOA, CGOA, and WGOA) ABC estimates in the SAFE document. In addition, a previous motion from the Council requested a discussion paper on directed fishing for skates in the EGOA. These items have been postponed until the December 2013 Council meeting, and at that time the discussion papers will be presented.

The Plan Team requested that the octopus stock assessment author provide area-specific ABC estimates in the final (November) assessment, using the modified Tier 6 approach averaging biomass estimates from the last three bottom trawl surveys (2009, 2011 and 2013).

The Plan Team **did not** request any further analyses of the consumption-based approach to estimate octopus mortality, noting that estimates are highly uncertain, the estimates are based on predation of octopus by Pacific cod in the BSAI, and the CIE reviewers were unsupportive of this approach.

The Plan Team accepted the area-specific ABC estimates that are available in the stock assessment document for the skate species of interest (big and longnose skates). Further special considerations for the assessment are unnecessary. The Team will have a discussion paper available from Council staff at that time on issues related to opening a directed fishery for skates in the EGOA and will make recommendations regarding that in November.

2014/2015 Harvest Specification Recommendations

The Team recommended the proposed 2014 GOA OFLs and ABCs that were published in the Federal Register last year for the purpose of notifying the public of potential final specifications. The proposed 2015 OFLs and ABCs were set equal to the 2014 values. See attachment.

Adjourn

The meeting adjourned at approximately 12:30 pm.

September 2013 BSAI Plan Team Proposed OFL and ABC Recommendations (metric tons) for 2014 - 2015

		2013				2014			2015		
Stock	**Area**	**OFL**	**ABC**	**TAC**	**Catch**	**OFL**	**ABC**	**TAC**	**OFL**	**ABC**	**TAC**
Pollock	EBS	2,550,000	1,375,000	1,247,000	1,146,604	2,730,000	1,430,000		2,730,000	1,430,000	
	AI	45,600	37,300	19,000	2,916	48,600	39,800		48,600	39,800	
	Bogos	13,400	10,100	100	57	13,400	10,100		13,400	10,100	
Pacific cod	BSAI	359,000	307,000	260,000	178,388	n/a	n/a		n/a	n/a	
	BS	n/a	n/a	n/a	169,840	352,470	300,390		352,470	300,390	
	AI	n/a	n/a	n/a	8,548	22,500	16,900		22,500	16,900	
Sablefish	BS	1,870	1,580	1,580	548	1,760	1,480		1,760	1,480	
	AI	2,530	2,140	2,140	702	2,370	2,010		2,370	2,010	
Yellowfin sole	BSAI	220,000	206,000	198,000	101,596	219,000	206,000		219,000	206,000	
Greenland turbot	BSAI	2,540	2,060	2,060	1,097	3,270	2,650		3,270	2,650	
	BS	n/a	1,610	1,610	818	n/a	2,070		n/a	2,070	
	AI	n/a	450	450	279	n/a	580		n/a	580	
Arrowtooth flounder	BSAI	186,000	152,000	25,000	18,515	186,000	152,000		186,000	152,000	
Kamchatka flounder	BSAI	16,300	12,200	10,000	7,500	8,300	7,100		8,300	7,100	
Northern rock sole	BSAI	241,000	214,000	92,380	55,401	229,000	204,000		229,000	204,000	
Flathead sole	BSAI	81,500	67,900	22,699	15,317	80,100	66,700		80,100	66,700	
Alaska plaice	BSAI	67,000	55,200	20,000	19,982	60,200	55,800		60,200	55,800	
Other flatfish	BSAI	17,800	13,300	3,500	1,467	17,800	13,300		17,800	13,300	
Pacific Ocean Perch	BSAI	41,900	35,100	35,100	26,460	39,500	33,100		39,500	33,100	
	BS	n/a	8,130	8,130	1,573	n/a	7,680		n/a	7,680	
	EAI	n/a	9,790	9,790	8,209	n/a	9,240		n/a	9,240	
	CAI	n/a	6,980	6,980	6,614	n/a	6,590		n/a	6,590	
	WAI	n/a	10,200	10,200	10,064	n/a	9,590		n/a	9,590	
Northern rockfish	BSAI	12,200	9,850	3,000	1,892	12,000	9,320		12,000	9,320	
Blackspotted/	BSAI	462	378	378	324	524	429		524	429	
rougheye	EBS/ EAI	n/a	169	169	173	n/a	189		n/a	189	
rockfish	CAI/ WAI	n/a	209	209	151	n/a	240		n/a	240	
Shortraker rockfish	BSAI	493	370	370	333	493	370		493	370	
Other rockfish	BSAI	1,540	1,159	873	653	1,540	1,159		1,540	1,159	
	BS	n/a	686	400	146	n/a	686		n/a	686	
	AI	n/a	473	473	507	n/a	473		n/a	473	
Atka mackerel	BSAI	57,700	50,000	25,920	16,031	56,500	84,900		56,500	84,900	
	EAI/ BS	n/a	16,900	16,900	8,899	n/a	16,500		n/a	16,500	
	CAI	n/a	16,000	7,520	7,012	n/a	15,700		n/a	15,700	
	WAI	n/a	17,100	1,500	120	n/a	16,700		n/a	16,700	
Skates	BSAI	45,800	38,800	24,000	19,643	44,100	37,300		44,100	37,300	
Sculpins	BSAI	56,400	42,300	5,600	4,323	56,400	42,300		56,400	42,300	
Sharks	BSAI	1,360	1,020	100	100	1,360	1,020		1,360	1,020	
Squids	BSAI	2,620	1,970	700	235	2,620	1,970		2,620	1,970	
Octopuses	BSAI	3,450	2,590	500	132	3,450	2,590		3,450	2,590	
Total	**BSAI**	**4,028,465**	**2,639,317**	**2,000,000**	**1,620,216**	**4,193,257**	**2,686,688**		**4,193,257**	**2,686,688**	

Sources: 2013 OFLs, ABCs, and TACs and 2014 OFLs and ABCs are from harvest specifications adopted by the Council in December 2012, except for BS and AI Pacific cod and Kamchatka flounder; 2013 catches through August 31 from AKR Catch Accounting.

September 2013 GOA Plan Team Proposed OFL and ABC Recommendations (metric tons) for 2014-2015 (Page 1)

		2013				2014			2015		
Species	**Area**	**OFL**	**ABC**	**TAC**	**Catch**	**OFL**	**ABC**	**TAC**	**OFL**	**ABC**	**TAC**
Pollock	W (61)		28,072	28,072	6,173		25,648			25,648	
	C (62)		51,443	51,443	41,988		47,004			47,004	
	C (63)		27,372	27,372	11,357		25,011			25,011	
	WYAK		3,385	3,385	2,917		3,093			3,093	
	Subtotal	150,817	110,272	110,272	62,435	138,610	100,756		138,610	100,756	
	EYAK/SEO	14,366	10,774	10,774	0	14,366	10,774		14,366	10,774	
	Total	165,183	121,046	121,046	62,435	152,976	111,530		152,976	111,530	
Pacific Cod	W		28,280	21,210	13,587		29,470			29,470	
	C		49,288	36,966	23,574		51,362			51,362	
	E		3,232	2,424	313		3,368			3,368	
	Total	97,200	80,800	60,600	37,474	101,100	84,200		101,100	84,200	
Sablefish	W		1,750	1,750	1,003		1,641			1,641	
	C		5,540	5,540	4,285		5,195			5,195	
	WYAK		2,030	2,030	1,910		1,902			1,902	
	SEO		3,190	3,190	2,593		2,993			2,993	
	Total	14,780	12,510	12,510	9,791	13,871	11,731		13,871	11,731	
Shallow-Water Flatfish	W		19,489	13,250	152		18,033			18,033	
	C		20,168	18,000	2,962		18,660			18,660	
	WYAK		4,647	4,647	1		4,299			4,299	
	EYAK/SEO		1,180	1,180	2		1,092			1,092	
	Total	55,680	45,484	37,077	3,117	51,580	42,084		51,580	42,084	
Deep-Water Flatfish	W		176	176	22		176			176	
	C		2,308	2,308	126		2,308			2,308	
	WYAK		1,581	1,581	4		1,581			1,581	
	EYAK/SEO		1,061	1,061	3		1,061			1,061	
	Total	6,834	5,126	5,126	155	6,834	5,126		6,834	5,126	
Rex Sole	W		1,300	1,300	98		1,287			1,287	
	C		6,376	6,376	3,129		6,310			6,310	
	WYAK		832	832	0		823			823	
	EYAK/SEO		1,052	1,052	-		1,040			1,040	
	Total	12,492	9,560	9,560	3,228	12,362	9,460		12,362	9,460	
Arrowtooth Flounder	W		27,181	14,500	779		26,970			26,970	
	C		141,527	75,000	13,164		140,424			140,424	
	WYAK		20,917	6,900	49		20,754			20,754	
	EYAK/SEO		20,826	6,900	68		20,663			20,663	
	Total	247,196	210,451	103,300	14,060	245,262	208,811		245,262	208,811	
Flathead Sole	W		15,729	8,650	569		16,063			16,063	
	C		26,563	15,400	1,556		27,126			27,126	
	WYAK		4,686	4,686	0		4,785			4,785	
	EYAK/SEO		1,760	1,760	-		1,797			1,797	
	Total	61,036	48,738	30,496	2,125	62,296	49,771		62,296	49,771	

Sources: 2013 OFLs, ABCs, and TACs and 2014 OFLs and ABCs are from harvest specifications adopted by the Council in December 2012; 2013 catches through August 31 from AKR Catch Accounting.

Proposed September GOA Plan Team OFL and ABC Recommendations (metric tons) for 2014-2015 (Page 2)

		2013				2014			2015		
Species	**Area**	**OFL**	**ABC**	**TAC**	**Catch**	**OFL**	**ABC**	**TAC**	**OFL**	**ABC**	**TAC**
Pacific	W		2,040	2,040	436		2,005			2,005	
Ocean	C		10,926	10,926	8,484		10,740			10,740	
Perch	WYAK		1,641	1,641	1,537		1,613			1,613	
	W/C/WYAK	16,838				16,555			16,555		
	SEO	2,081	1,805	1,805	0	2,046	1,775		2,046	1,775	
	E(subtotal)										
	Total	18,919	16,412	16,412	10,457	18,601	16,133		18,601	16,133	
Northern	W		2,008	2,008	2,164		1,899			1,899	
Rockfish	C		3,122	3,122	2,360		2,951			2,951	
	E		-	-	-		-			-	
	Total	6,124	5,130	5,130	4,524	5,791	4,850		5,791	4,850	
	W		104	104	39		104			104	
Shortraker	C		452	452	376		452			452	
Rockfish	E		525	525	246		525			525	
	Total	1,441	1,081	1,081	661	1,441	1,081		1,441	1,081	
Dusky	W		377	377	215		354			354	
Rockfish	C		3,533	3,533	2,597		3,317			3,317	
	WYAK		495	495	3		465			465	
	EYAK/SEO		295	295	7		277			277	
	Total	5,746	4,700	4,700	2,822	5,395	4,413		5,395	4,413	
Rougheye	W		81	81	20		83			83	
and	C		856	856	385		871			871	
Blackspotted	E		295	295	188		300			300	
Rockfish	Total	1,482	1,232	1,232	593	1,508	1,254		1,508	1,254	
Demersal shelf rockfish	Total	487	303	303	209	487	303		487	303	
Thornyhead	W		150	150	216		150			150	
Rockfish	C		766	766	449		766			766	
	E		749	749	221		749			749	
	Total	2,220	1,665	1,665	886	2,220	1,665		2,220	1,665	
Other	W		44	44	194		44			44	
Rockfish	C		606	606	425		606			606	
(Other slope)	WYAK		230	230	65		230			230	
	EYAK/SEO		3,165	200	44		3,165			3,165	
	Total	5,305	4,045	1,080	728	5,305	4,045		5,305	4,045	
Atka mackerel	Total	6,200	4,700	2,000	1,241	6,200	4,700		6,200	4,700	
Big	W		469	469	71		469			469	
Skate	C		1,793	1,793	1,807		1,793			1,793	
	E		1,505	1,505	61		1,505			1,505	
	Total	5,023	3,767	3,767	1,939	5,023	3,767		5,023	3,767	
Longnose	W		70	70	37		70			70	
Skate	C		1,879	1,879	972		1,879			1,879	
	E		676	676	365		676			676	
	Total	3,500	2,625	2,625	1,374	3,500	2,625		3,500	2,625	
Other Skates	Total	2,706	2,030	2,030	1,409	2,706	2,030		2,706	2,030	
Sculpins	GOA-wide	7,614	5,884	5,884	1,241	7,614	5,884		7,614	5,884	
Sharks	GOA-wide	8,037	6,028	6,028	793	8,037	6,028		8,037	6,028	
Squids	GOA-wide	1,530	1,148	1,148	147	1,530	1,148		1,530	1,148	
Octopuses	GOA-wide	1,941	1,455	1,455	191	1,941	1,455		1,941	1,455	
Total		738,676	595,920	436,255	161,600	723,580	584,094		723,580	584,094	

Sources: 2013 OFLs, ABCs, and TACs and 2014 OFLs and ABCs are from harvest specifications adopted by the Council in December 2012; 2013 catches through August 31 from AKR Catch Accounting.