

Joint Groundfish Plan Team minutes

September 18-19, 2007
Alaska Fisheries Science Center
Seattle, WA

The Joint meeting of the BSAI and GOA groundfish Plan Teams convened Tuesday, September 18th at 9:00 am at the Alaska Fisheries Science Center in Seattle, Washington.

Members of the Plan Teams present for all or part of the meeting included:

Loh-Lee Low	AFSC REFM(BSAI chair)	Jim Ianelli	AFSC REFM (GOA co-chair)
Lowell Fritz	AFSC MML	Diana Stram	NPFMC (GOA co-chair)
David Carlile	ADF&G	Sandra Lowe	AFSC REFM
Steven Hare	IPHC	Jeff Fujioka	AFSC ABL
Jane DiCosimo	NPFMC (Coordinator)	Jon Heifetz	AFSC ABL
Theresa Tsou	WDFW	Robert Foy	NMFS
Brenda Norcross	UAF	Nick Sagalkin	ADF&G
Andy Smoker	NMFS AKRO	Cleo Brylinsky	ADF&G
Grant Thompson	AFSC REFM (Rapporteur)	Tom Pearson	NMFS AKRO
Ivan Vining	ADF&G	Ken Goldman	ADF&G
Dan Lew	AFSC	Sarah Gaichas	AFSC REFM
		Steven Hare	IPHC
		Theresa Tsou	WDFW

Plan Team members who were unable to attend include Mike Sigler (BSAI Vice-chair), Kerim Aydin, and Kathy Kuletz because they were attending a concurrently scheduled meeting. Ward Testa (GOA Team) was also absent. About 40 members of the public and AFSC attended parts of the meeting.

The teams welcomed new members Steven Hare and Cleo Brylinsky and noted that Bob Foy moved from UAF to NMFS and a university seat could be filled with a new member, at the Council's discretion. The teams reviewed changes to the draft agenda.

Research Priorities

The Teams noted that its opportunity for suggesting revisions to the research priorities is at its joint team September meeting, while the SSC/Council cycle for annually revising research priorities is April. The teams reviewed the Council's current research priorities and designated subgroups to suggest revisions for SSC and Council consideration when those bodies next consider revisions. The joint team suggestions for revisions to the research priorities are attached to the minutes.

Stock Assessments: Loh-lee Loh, Jim Ianelli, and Sandra Lowe

Fishery Performance and Monitoring: Tom Pearson, Andy Smoker, Nick Sagalkin

Fishery Interactions: Steven Hare, Ivan Vining, Cleo Brylinsky

Ecosystem: Sarah Gaichas, Bob Foy, Teresa Tsou

Protected Species Interactions: Lowell Fritz, Jeff Fujioka, Dave Carlile

Habitat: Jon Heifetz, Ken Goldman, Brenda Norcross

Other research: Dan Lew, Diana Stram, Jane DiCosimo

ABC/TAC Specifications Process

For the December 2007 Council meeting, the NMFS AKRO staff will prepare a Supplemental Information Report to the 2006 EIS using the information generated in the November 2007 SAFE report. The SAFE report will be the latest scientific information to determine whether (1) substantial changes to

the proposed action have occurred or (2) new information or circumstances exist relevant to environmental concerns and bearing on the proposed action or its impacts. It is expected that no substantial changes in the action (harvest strategies) and no new information or circumstances that would lead us to modify the conclusions about the impacts of the action will be found. The teams will convene separately to recommend OFLs and ABCs for the proposed rule for the 2008/2009 fisheries. These will not be used to open the 2008 fishery but to fulfill Administrative Procedures Act for the final rule. The final specifications recommended by the Council in December 2006 will start the 2008 fisheries.

Council activities Jane DiCosimo distributed a summary sheet of Council activities. The Secretary is reviewing a recommendation to remove dark rockfish from the GOA and BSAI groundfish FMPs, following a GOA Plan Team recommendation. The FMP amendment is expected to be implemented for the 2009 fisheries. The Council will consider a staff recommendation to separate two other species actions into two analyses on separate timelines. The first action would amend the GOA FMP to authorize and OFL and ABC for the other species assemblage. Final action could occur by June 2008 and be implemented for the next specification cycle in 2009/2010; in that event, chapters for GOA sharks, squids, sculpins, octopuses, and possibly grenadier would be needed by November 2008 to set group specifications. For the second analysis, Scott Miller has prepared a discussion paper with a preliminary analysis of which fisheries may be directly affected by group level specifications and a plan for preparing the economic analysis. This analysis is planned for review in Spring 2008, but is not likely to be implemented by 2009.

Olav Ormseth gave a short presentation his efforts regarding the removal of non-target species from the specification process. These ideas build on the work of many others over the last decade and have yet to be enlarged into a formal proposal for Council action. Managing non-targets outside of the MSY-based framework is sensible because we are not managing these species for yield. Using a different management approach also provides the opportunity to use management tools that are more appropriate for data-limited species. He suggested that removal of non-targets from specification be a formal process, based on a quantitative analysis of the level of fishing mortality relative to natural mortality. Species that are subject to relatively low levels of fishing impact would be candidates for removal. Criteria based on the life history and ecology of species or species groups would be used to develop alternative management approaches. For example, a minimum catch allowance may be appropriate for fast-growing, short-lived animals such as squid. AFSC scientists have concerns that removal from specification may reduce the level of interest in and protection of non-target species. For sensitive species, such as sharks, a catch limit may still be necessary to provide a minimum level of protection. These limits could be based on non-MSY criteria similar to those used to manage threatened or endangered species, and might result in maintaining some non-target species at levels below B_{MSY} . Ormseth also proposed that the status of non-target species that are not adequately sampled in AFSC surveys could be monitored through periodic special projects. For example, a pelagic survey for sharks could be conducted every five years to monitor abundance. Changes in age structure or age at maturity may also serve as symptoms of population declines. An additional advantage of the proposed management changes would be that we could formalize the development of new fisheries on non-target species.

Tier 6 approaches Liz Connors noted that for octopus catch data reflects incidental catch history and not commercial catch history. There is no evidence of negative impacts to the octopus stocks from the current management approach, therefore we can consider continuing incidental catch levels to continue at what it has been and can take the maximum Incidental Catch Allowance, rather than the average. The GOA Team adopted this approach in 2006, but the BSAI Team adopted Tier 5.

B₀ Martin Dorn briefly summarized the Pacific Council process for biennial stock assessment with the off year used to hold science workshops on selected topics. In December 2006, the Pacific Council's SSC held a workshop to address the following three issues: (1) evaluate the performance of the Pacific Council's 40-10 harvest policy for stocks with different life history and stock-recruit patterns, (2) evaluate alternative methods to estimate B_0 and B_{MSY} proxies and provide recommendations on their use, and (3)

provide recommendations on the use of priors for key assessment parameters in stock assessment models. Parameters for which priors could potentially be useful include natural mortality, stock-recruit steepness, survey catchability, and recruitment variability. Melissa Haltuch (NWFSC) gave her AFS presentation on estimators of fishery management reference points to the teams. AFSC assessments use the second half of the data set because of regime shift and different parts of stock recruitment curve compared with Haltuch's use of the entire timeline for stable stocks. The question for the teams is whether to: (1) continue with our false estimate of B₀, (2) embrace the real B₀, or (3) look at other approaches. The teams noted if stock recruitment can be estimated in the model. There's a pretty high standard to go from tier 3 to tier 1, which may be more restrictive than necessary. The teams noted that authors could estimate an intrinsic stock recruitment relationship in the assessments more regularly.

Annual Catch Limits and Accountability Measures are a new requirement of the 2006 Magnuson-Stevens Reauthorization Act. They must be implemented in fishing year 2010 for fisheries determined by the Secretary to be subject to overfishing and 2011 for those that are not. Preliminary guidance suggests that for each managed stock an OFL should be established and an ACL must be established. An ACL would be an annual numerical target catch level and set below the OFL to ensure that overfishing does not occur. An AM is a management measure established with ACLs to end and prevent overfishing. NMFS will develop guidelines by year end. Jane DiCosimo reported that it may be possible for the Council to restart its analysis to separate groundfish into target and non-target categories and move some non-target species out from the specification process.

MSE for GOA pollock fishery Teresa A'mar (UW) presented her findings from the Management Strategy Evaluation (MSE) work applied to GOA pollock. This study is part of the larger initiative at the AFSC to evaluate current harvest policies and provide tools for developing alternatives. The latest developments include methods to link environmental ecosystem forcing as part of (or impacting) the operating model from which simulations are conducted (and subsequently evaluated with current single-species assessment models). The Teams were encouraged by her progress and from results presented, it appeared that no immediate concerns were raised about the current assessment/ABC setting system.

Bering Sea Integrated Ecosystem Research Plan Mike Sigler briefed the teams on ongoing projects under the BSIERP. The plan will form the basis of a trophic level examination of focal species in the field and linked through models. There are seasonal components to the studies being conducted in spring, summer, and fall. The plan will address both broad and finer scale issues, including (1) specific trophic interactions, (2) affects on people and communities through collection of local traditional knowledge; (3) affects on fishermen (economics). New surveys will be built on existing research initiatives (FOCI, BASIS), and new cruises will commence through BEST (Bering Ecosystem Study) which is funded by the National Science Foundation.

Economic SAFE report Ron Felthoven summarized the 2007 Economic SAFE report. The current draft This report contains detailed information about economic aspects of the fishery, including figures and tables, reports on the various fleets operating within the fishery, market analyses for the most commercially valuable species, and a summary of the relevant research being undertaken by the Economic and Social Sciences Research Program at the AFSC. The final draft of this document will include three sets of additional information: (1) a fleet profile of the vessels targeting pollock; (2) a set of market analyses for pollock, Pacific cod, sablefish and flatfish; and (3) project descriptions and updates for ongoing research activities of the Economics and Social Sciences Research Program (ESSRP) at the AFSC. Felthoven previewed 26 projects undertaken by his staff.

Flatfish CIE review Tom Wilderbuer summarized the reviewer's comments from the flatfish CIE review that were released a week ago. The review covered the assessments of arrowtooth flounder and rex sole in the Gulf of Alaska and flathead sole, Greenland turbot, northern rock sole, and yellowfin sole in the BSAI and GOA. There was consensus that the modeling for BSAI and GOA flatfish assessments and harvest recommendations were appropriate given the available data and provided the best scientific advice. The

reviewers provided 32 specific recommendations for the three terms of reference which encompassed the review. There has not been sufficient time for the AFSC to respond to the reviews. Plans were already underway to develop a split sex model for BSAI yellowfin sole in 2008, include more uncertainty in the projections (for many assessments), and multi-species modeling.

Wilderbuer asked if the teams had recommendations to prioritize the CIE recommendations for changes to the models. The teams felt that they did not have sufficient time to review the CIE recommendations so as to prioritize the recommendations, however, the teams did address some of the CIE recommendations. The teams discussed whether the lack of trawl survey coverage and the corresponding expansion of the trawlable area to the untrawlable area came up during the CIE review as it was an issue in the rockfish CIE reviews that is generic to other groundfish stocks. Wilderbuer responded that it did not come up. In response to a CIE recommendation, the team member discussed that there was no directed fishery on rex sole, so a fishery selectivity estimate could not be determined. One would not want to set TAC on a selectivity based on bycatch harvests. And while it is important to get correct age data, this is not key to the rex sole assessment. The team wondered if the CIE reviewers noted something specific to flatfishes in the recommendation for multi-species modeling for flatfish. Wilderbuer could not report on any specific CIE discussion on this issue. An industry representative questioned a recommendation that suggested using the fishery CPUE as an index of abundance in the face of potential survey budget reductions. He asked how one could tease out market effects on annual harvests. The teams concurred with Wilderbuer's response that he would not want to use CPUE to estimate abundance.

Some of the recommendations are equally applicable to all groundfish assessments, but without a AFSC response to guide the team members no specific recommendations were made. The teams will keep them in mind during reviews of flatfish assessments in November 2007. The teams recommended that the Council request that the AFSC provide a written response to the CIE reviews and report to the Council at a future SSC meeting (possibly February 2008 in Seattle).

Pacific halibut review Bill Clark summarized the CIE review, which followed a 2003 Marine Stewardship Council review and a 2004 review by Paul Spencer and others. He reported that the coastwide assessment was controversial. It involved assessing the abundance of the halibut stock as a single coastwide unit, rather than independently estimating the biomass of each regulatory area (closed-area assessments), as had been done over the previous two decades. The coastwide approach was taken primarily in response to new information from tagging programs, which showed greater levels of movement by adult fish than previously believed, but also was intended to resolve some disparities among independent estimates of stock biomass distribution. This methodology for partitioning the coastwide biomass estimate was not endorsed by the Commission in January 2007, in part because the Commission wanted to have a more thorough and broader review of any new methodologies. In May 2007 the IPHC staff held a combination public workshop and CIE review over 1 ½ days, followed by private discussions between the staff and CIE reviewers. Background documents were posted online prior to the workshop. All staff presentations were posted online, along with public workshop summary, and CIE reviews. Steven Hare summarized the IPHC harvest policy and CIE recommendations. The CIE review has not been made public to allow the Commissioners and scientific advisors to review the recommendations.

Pacific cod Grant Thompson reported on (1) the Pacific cod technical workshop held in April at the request of the SSC and (2) the preliminary assessment of the Bering Sea stock. The workshop included reports on both background research and assessment research pertaining to Pacific cod. Results from a large number of models were presented in detail: 23 models of the Bering Sea stock and 17 models of the Gulf of Alaska stock were developed prior to the workshop, and 8 models were developed during the workshop itself. The workshop was open to the public and 44 people participated. Pat Livingston served as chair and Liz Connors served as rapporteur. The workshop concluded with a session in which all of the participants were invited to make suggestions for this year's assessments. Forty suggestions were received.

For this year's preliminary assessment, the suggestions from the workshop were considered by the assessment authors, who then settled on four models to present. The four models deal with the Bering Sea stock only. The data used in these models were basically similar to the data used in last year's assessment, except that trawl and longline fishery CPUE data were included and age data were treated as age-at-length compositions rather than traditional age compositions. The models had several features in common, including: A) selectivity for the January-May trawl fishery was constrained to be monotone increasing; B) length at age 1, recruitment, and the ascending limbs of all selectivity schedules were allowed to vary annually; C) all parameters were estimated internally; and D) uniform priors were used exclusively. Other features of the four models were as follow: Model 1 started in 1976, attempted to estimate the effect of a 1976 regime shift on median recruitment, and did not attempt to fit the fishery CPUE data; Model 2 was the same as Model 1 except that it allowed the natural mortality rate to increase linearly with age after age 8; Model 3 was the same as Model 1 except that it attempted to fit the longline fishery CPUE data; and Model 4 started in 1982, did not attempt to estimate a regime shift effect on median recruitment, attempted to fit the longline fishery CPUE data, did not attempt to fit the initial (equilibrium) catch, did not attempt to fit the age data, and iteratively re-weighted input variance parameters for all abundance and size composition data.

Estimates of some key parameters were as follow: All four models estimated the natural mortality rate at values (0.43-0.68 for ages 0-8) higher than the traditional value of 0.37. Models 1-3 gave estimates of mean length at age 1 (11.7-11.8 cm) very similar to the value used in last year's assessment (11.3 cm), while Model 4 gave a lower estimate (7.1 cm). Models 1-3 gave estimates of the Brody growth coefficient (0.07-0.08) that were lower than the value used in last year's assessment (0.11), while Model 4 gave a higher estimate (0.20). Model 4 gave a higher estimate of the variability of length at old ages than the other three models (a different relationship was used in last year's assessment). The four model estimates of catchability for the post-1981 shelf bottom trawl survey (0.45-0.69) bracketed the value of 0.57 estimated in last year's assessment.

In terms of goodness of fit, Model 3 gave the best fits to the survey biomass and longline fishery CPUE data but tended to fit the size composition data worse than the other models. Model 4 gave the best fits to the size composition data but the worst fits to the survey biomass and longline CPUE data (even though Model 4 attempted to fit the longline CPUE data, the iterative re-weighting used in Model 4 resulted in these data being largely de-emphasized). The fits provided by Models 1 and 2 tended to be intermediate between Models 3 and 4. The log likelihood obtained by Model 2 was over 20 points better than that obtained by Model 1, with the greatest difference being in the fits to the survey size composition data.

In terms of results, all four models agreed that the 2001-2004 year classes were likely below average, and all but Model 4 agreed that the 2000 year class was also likely below average. These results are similar to the results obtained in last year's assessment. Model 1's estimated time series of female spawning biomass was almost identical to that obtained in last year's assessment, with Model 2's estimated time series tending to be slightly lower, Model 3's estimated time series tending to be much higher, and Model 4's estimated time series weaving back and forth between the others. For total biomass (both sexes and all ages combined), the results roughly paralleled those for spawning biomass, except here Model 2 rather than Model 1 gave results most similar (almost identical) to those from last year's assessment.

Most of the Plan Team discussion centered on the reliability of the age data. It was noted that the mean lengths at ages 1-4 from the age data sometimes do not line up well with the first few modes from the survey length composition data; more specifically, the mean lengths at ages 2 and 3 or 3 and 4 sometimes appear to straddle a single mode in the length composition data. It was noted that the AFSC ageing lab has devoted considerable effort to making sure the age data are accurate and that the method has been validated in a peer-reviewed article based on tagging data and the relationship between fish age and otolith size. Dan Kimura and Delsa Anderl from the ageing lab offered the following possible explanations for discrepancies between estimated mean lengths and survey length modes: A) the models are fitting the annual distribution of ages within individual length bins, meaning that sample sizes are very

small; B) beyond about 30 cm, the survey length compositions are undoubtedly mixtures of age-specific length compositions, meaning that the modes in the survey length compositions could be misleading indicators of the locations of the underlying age-specific modes; C) the models may not be capturing the full range of interannual variability in the length-at-age relationship; and D) otoliths collected during the summer are more difficult to age due to potential ambiguity of edge types. Other participants in the discussion noted that that the survey takes place over a period of several weeks during which substantial growth of young fish could be occurring, that an ageing error of plus/minus 1 year can be significant if the error occurs at young ages, and that an alternative explanation for the discrepancy is “de-recruitment” of age 2 or 3 fish from the survey by movement upward in the water column or out of the survey area. *The Plan Team agreed to include a recommendation for a “known age” tagging study of Pacific cod, similar to the study recently conducted for sablefish, in its list of research priorities.*

An industry consultant suggested several features to include in the final assessment. These included: A) ignore the age data, B) use survey numbers rather than survey biomass as an index of abundance, and C) increase the standard errors of the survey abundance indices to a “more appropriate” level (one that would account for process errors that are missing from the overall model in addition to measurement error from the survey itself).

There was also some discussion regarding estimation of annual deviations for growth and selectivity parameters. It was noted that the amount of variability estimated for the fixed gear fisheries, in particular, was very small and may not be worth the additional parameters needed. A suggestion was also made to the effect that the way interannual growth variability is modeled within SS2 could be problematic because the parameters define the length-at-age relationship for a particular year rather than a particular cohort. It was also suggested that the choice of upper reference age for the relationship describing variability in length at age be examined.

For the final assessment, the authors reported that they will attempt to include bycatch data from the IPHC longline survey as an index of relative abundance. Pacific cod size composition data were collected from this year’s IPHC survey but were not available in time to include in the preliminary assessment. The team commended Thompson for its efforts on the workshop and revisions to the BS model, and had no specific recommendations pertaining to the Pacific cod assessment.

Public participation Loh-lee Low raised the issue of public participation in stock assessment reviews in the context of periodic public work shops of selected AFSC stock assessments that were recently held by the AFSC for Pacific cod in April 2007 and of Pacific halibut by the IPHC in conjunction with a CIE review in June 2007. Low acknowledged that the AFSC cannot undertake public workshops during the Plan Team process, in accordance with the Council’s policy on external review guidelines for groundfish. Strong public interest was expressed by a number of industry representatives to attend the full CIE reviews. The Pacific Council’s Stock Assessment Review (STAR) Panel and the CIE reviews for those stock assessments include full participation by the public.

The teams stressed that at least three processes were being intermingled in this discussion: (1) the Plan Team reviews of stock assessments, (2) CIE reviews of particular stock assessments on a separate timeline from the Plan Team process, and (3) moderated public education workshops. The Plan Team process includes three components: (i) staff presentations, (ii) technical review, and (iii) public participation (but not education). The CIE reviews have two components: (i) staff presentations and (ii) technical interaction between the CIE reviewers and stock assessment authors. The AFSC has conducted both of those privately for their reviews, while the IPHC included the public in the presentation portion of the meeting, but held the technical interaction between the reviewers and stock assessment authors private. Both agencies held the CIE review technical discussion private; there has been some misunderstanding by the public on this point, as some have expressed the opinion that the IPHC process was more open than that of the AFSC. The difference between the two events was public attendance at the staff presentation provided to the CIE reviewers. Public workshops have been held by both agencies.

These were well attended by both scientists and industry, and addressed a different goal than the technical reviews.

The teams concurred that the AFSC could increase communication with the public through workshops, but did not reach agreement on a recommendation to include the public during the staff presentations to the CIE panel. Some team members agreed that the technical interactions between the reviewers and staff benefited from their focused one-on-one interaction and should not be opened to the public. Sandra Lowe reported that a proposal for a CIE review of Atka mackerel for 2008 has been submitted. The proposed format includes an open public presentation portion and a private technical review.

Sablefish Dana Hanselman provided the teams an overview of the joint sablefish assessment. He previewed two approaches that will be incorporated into the sablefish assessment. He reported on an updated growth analysis for Alaska sablefish. ABL staff and Katy Howard, a UAF graduate student, updated and corrected for bias in the older length-stratified data (1981-1993), analyzed newer randomly collected samples (1996-2004), and estimated new length-at-age and weight-at-age parameters. The analyses showed that both male and female sablefish growth has changed modestly, but significantly. Recently, sablefish are growing to a larger maximum size. They then applied the updated growth data to the current stock assessment model through new age-length transition matrices. The model using the new growth data provided a superior fit to survey and fishery data, while abundance and recruitment trends remained similar. He recommended using the two growth periods divided into the two time periods (1981-1993 and 1996-2004). The teams concurred with this approach.

Hanselman summarized additional modeling revisions. Prior distributions for survey and fishery catchability were computed using NMFS trawl survey biomass estimates which provide more informative distributions than previously used. New prior distributions for catchability appear to be reasonable values, and are within the range of previous values used in the sablefish stock assessment. The most important assumption in this analysis that may be violated is that the trawl survey catchability is equal to 1. It is more likely that the true catchability of the trawl survey is less than, rather than more than 1, because (1) sablefish are capable of evading the net and (2) the trawl survey has limited coverage of the full depth distribution of sablefish. If this is true, then assuming a trawl catchability of 1 is a precautionary assumption. However, there is enough uncertainty in the derived prior distributions for the data to provide substantial influence on the final estimate, yet there is enough precision to guide the model on how each catchability value is related between indices.

Applying these distributions to the model should result in greater model stability, and more precise estimates of biomass. The effect on harvest recommendations will likely be small, but directionality is not obvious due to interaction between the catchabilities and other parameters such as selectivity. The plan team encouraged showing a model run using these catchability priors in November.

Hanselman also summarized a interagency workshop on sablefish that was held in Seattle on February 21 – 23, 2007. The purpose of the workshop was to bring together sablefish assessment scientists from the United States and Canada to exchange information, describe ongoing work, identify new avenues for research, and investigate cooperative research opportunities. A workshop summary was prepared and is found at: (ftp://ftp.afsc.noaa.gov/afsc/public/Plan_Team/SablefishWorkshopSummaryFinal.pdf).

Jane DiCosimo summarized an interagency discussion that occurred on September 18, 2007 in response to a request by the Council to the AFSC in December 2005 on a number of BSAI sablefish management issues (see Appendix). She summarized the discussion and consensus of most of the participants. The Plan Teams endorsed the consensus for the Council to consider revising the escape panel regulations to a rectangular panel instead of the slash. This should be done in cooperation with the State of Alaska. The rationale for the change is to decrease the amount of unknown mortality of small sablefish. The teams also recommended a universal policy for accounting of State water catches (not inside waters) with the Federal TAC.

EBS Bottom Trawl Survey Bob Lauth summarized the results from the 2007 survey. In addition to routine survey duties, AFSC staff undertook 29 special projects and data collection. These included: MACE acoustic data collection, trawl gear comparison, light effects on pollock distribution, using acoustic data to reduce variance of pollock trawl catches, summer zooplankton abundance, seabird and fishery interactions, trophic interactions and feed ecology, Alaska skate age and growth, and egg case collections, octopus life history, validating Pacific cod visual maturities, sand lance taxonomy, ichthyophonous in walleye pollock, reproductive biology of yellow Irish lord, improving trawl gear monitoring, prey library DNA collections, taxonomic collections for coral, decapods, and sand lance.

Lauth highlighted a few points for the teams. The cold pool ($< 2^{\circ}\text{C}$) reached a little further south in 2007. Pollock biomass estimates increased this year to 4.16 mt, but this is only 87 percent of the long term average. Most of the pollock biomass increase was seen in the northwest portion of the EBS. There was an 18 percent decline in P. cod biomass, with a positive sign of recruitment of young-of-the-year fish. Yellowfin sole biomass was similar to 2006. Declines were seen for rock sole, flathead sole, Bering sole, Greenland turbot, arrowtooth flounder, and Kamchatka flounder. Colder bottom temperatures were probably related to the delay in the molting and spawning of female red king crab in Bristol Bay that necessitated re-sampling of 32 red king crab stations at the end of the survey; this was the fourth time during the history of the survey that re-sampling was necessary. The team noted that Jennifer Boldt's studies show that this pattern is normal and warmer years are less common historically.

Rockfish Working Group Paul Spencer provided a brief update on the status of the RWG and some specific research projects: (1) RACE is hiring a hydroacoustic technician to determine the roughness of the sea floor from split beam data in response to rockfish CIE recommendations to reevaluate the expansion of survey trawl data from trawlable areas to untrawlable areas, (2) Sandra Lowe has developed a contract for Bryan Black at Oregon State university to conduct a shortspine thornyhead aging study, (3) Auke Bay Lab scientists will assess maternal effects of rockfish in southeast Alaska, and (4) Spencer will continue his work modeling the influence of maternal effects on harvest rate reference points.

Multi-species technical workshop. Jim Ianelli reported on three multi-species statistical age-structured models that were examined in great detail at a recent workshop held at the AFSC. These models have been developed in separate labs (UW, AFSC, and UAF) for the Aleutian Islands, EBS, and GOA, respectively. Also, interested participants presented their work on similar multi-species models in Korea and from the Grand Banks off New England. The exchange of approaches was particularly useful and demonstrated the utility of the stomach content data collections. Also, since the EBS has lots of data on size at age, there may be potential to link growth data with temperatures and evaluate inter-annual variability in ration.

Aleutian Islands Fishery Ecosystem Plan Sarah Gaichas reported on the status of the AI FEP, which was adopted by the Council in June 2007. The AI FEP is broad in scope, and assembles all current information on historical, physical, biological, socioeconomic, and management relationships in the AI, including issues normally outside the scope of the Council process and fisheries management, such as military activity, shipping, and oil and gas exploration. The FEP team identified critical interactions in the AI using this background information, suggested current and potential indicators to assess the status of these critical interactions, and applied a risk assessment framework to prioritize interactions most important to the Council. A "glossy" synthesis of the AI FEP is currently in production, and will be distributed when available. The AI FEP is considered a "living document" which will be revisited by the FEP team and Council periodically to update information and re-assess potential risks to the AI ecosystem and sustainable fisheries and communities in that region. The teams briefly discussed how the FEP team may be best utilized to advise the groundfish plan teams and Council on forthcoming changes and/or early warning signs. Some ideas were discussed such as having individual assessment authors call attention to specific interactions as identified in the FEP and cross reference where additional information could be found with respect to this.

Ecosystem Considerations Sarah Gaichas summarized the updated and/or new indices in the Ecosystem Considerations report. Overall, there were 22 updated contributions and 6 new contributions. Many of the physical environmental indices in the Ecosystem Considerations report were updated. For example, the Pacific Decadal Oscillation (PDO), which is the leading mode of North Pacific sea surface temperature (SST) variability, transitioned from moderately positive in early 2006 to moderately negative in the summer/early fall of 2006 and has slowly increased to weakly positive values during the summer of 2007. When the PDO is positive, SST anomalies tend to be positive along the North American coast, extending to the south-eastern Bering Sea. The Bering Sea experienced a relatively cold winter and spring (2007). The presence of sea ice together with below normal ocean temperatures likely resulted in the first ice edge primary production bloom since 1999. Despite the presence of ice in the Bering Sea, there was a record low total area of sea ice in the Arctic in the summer of 2007. Unlike the northern Bering Sea and Arctic Ocean hot spots, the rate of warming in the southern Bering Sea is slowing down, suggesting a large natural variability component to recent extremes in addition to a background anthropogenic contribution toward warmer temperatures.

Some biological indices were also updated in this draft of the Ecosystem Considerations report. For example, demersal groundfish species in the BSAI and GOA had above-average recruitments from the mid- or late 1970s to the late 1980s, followed by below-average recruitments during most of the 1990s. There is an indication for above-average recruitment from 1994-2000 (with the exception of 1996). In the Gulf of Alaska, recruitment has been below average across stocks since 2001. Annual groundfish surplus production in the EBS and GOA decreased between 1978 and 2005. Declines in production may be a density-dependent response to observed increases in biomass and aging populations of groundfish.

The eastern Bering Sea groundfish community appears to have fewer small individuals and more large individuals through time. The community size spectrum (CSS) slope became less negative and the CSS intercept decreased from 1982-1987, primarily due to significant changes in the slopes and intercepts of non-target fish over time. This would imply that, overall (and particularly for non-target fish), the groundfish community has fewer small individuals and more large individuals through time. Factors other than fishing, such as the regime shift in 1976/77, may have had an influence on the community size spectrum.

Additional updates will be provided in the final November 2007 report.

Ecosystem Assessment Kerim Aydin reported that the ecosystem assessment section was not updated for the September 2007 draft, but may be updated for the final 2007 report. This year work on the Ecosystem Assessment is going to address three of the recommendations that came out of the PICES/NPRB workshop (Seattle, WA June 1-3, 2006): (1) publish concise, attractive executive summaries, (2) research how to synthesize data into fewer indicators, and (3) develop and utilize a formal process of evaluating and selecting indicators. Procedures for rating and vetting indices as well as blending data analysis and modeling into fewer indicators are being examined. He identified that one goal is to have a limited number of indicators that clearly and concisely communicate the status of the ecosystem, and indicate the future direction of the ecosystem. The approach taken will follow the Driver/Pressure, State, Impact, Response (DPSIR) model for turning indicators into potential action thresholds. Developing a DPSIR approach may be part of the development of an Integrated Ecosystem Assessment (IEA) for the region, although there is no current timeline for the development of IEAs for Alaska.

Marine Mammal Update Lowell Fritz provided an update on research results for Steller sea lions and northern fur seals. The adult and juvenile portion of the western stock of Steller sea lions was surveyed in June 2007 using a NOAA Twin Otter aircraft. Because of weather and logistical delays, it was not possible to do a complete survey of the range of the western stock in Alaska. Results were not available for the meeting but will be presented at the Steller Sea Lion Mitigation Committee meeting in Seattle, 16-18 October 2007. Fritz provided a summary of modeling and mark-recapture work to estimate Steller sea lion vital rates. Historical modeling analysis (Holmes et al, in press, Ecological Applications, Dec 2007)

indicated that the decline in the western population of Steller sea lions in the 1980s was primarily caused by a steep decline in juvenile survival, but was also associated with smaller declines in adult survival and natality (birth rate per female). Through the 1990s, when the western stock decline rate lessened, survivorship increased while natality continued to slip. Currently, reproductive rates are only two-thirds those of the 1970s while survival is at least as good or greater than that estimated for the 1970s. Holmes et al. concluded that factors that caused the decline, primarily 'top-down' factors affecting survival, are different from those that are affecting recovery, which are primarily 'bottom-up' factors affecting the condition and reproduction of adult females. With respect to northern fur seals, a count of adult males on the Pribilof Islands was conducted in July 2007, and data were presented for St George Island only. Pup production in 2007 was estimated on Bogoslof Island. While the results have not been finalized, preliminary analysis indicates that the population has continued to increase on Bogoslof Island and it may now produce as many pups as all of St George Island (approximately 17,000 per year). Adult females from Bogoslof Island forage almost exclusively in nearby slope and basin waters (where pollock fishing has been prohibited since 1992) and make short foraging trips of 1-2 days duration. Pribilof fur seals forage primarily in shelf waters and make longer foraging trips of 7-10 days duration. The consequences of the differences in summer female foraging strategies for pup and female condition and survival from the different rookeries is being explored.

The meeting adjourned on Wednesday, September 19, at approximately 4 pm.