Joint Groundfish Plan Team minutes

September 22-23, 2008
Alaska Fisheries Science Center
Seattle, WA

The Joint meeting of the BSAI and GOA groundfish Plan Teams convened Monday, September 22nd 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)
Mike Sigler	AFSC (BSAI Vice chair)	Diana Stram	NPFMC (GOA co-chair)
Kerim Aydin	AFSC REFM	Sandra Lowe	AFSC REFM
Lowell Fritz	AFSC NMML	Jeff Fujioka	AFSC ABL
David Carlile	ADF&G	Jon Heifetz	AFSC ABL
Steven Hare	IPHC	Robert Foy	NMFS AFSC Kodiak
Jane DiCosimo	NPFMC (Coordinator)	Cleo Brylinsky	ADF&G
Theresa Tsou	WDFW	Tom Pearson	NMFS AKRO Kodiak
Brenda Norcross	UAF	Ken Goldman	ADF&G
Mary Furuness*	NMFS AKRO Juneau	Steven Hare	IPHC
Grant Thompson	AFSC REFM	Leslie Slater*	USFWS
Dave Barnard*	ADF&G	Nancy Friday*	AFSC NMML
Leslie Slater*	USFWS		*nominated to fill vacancies

Plan Team members who were unable to attend included Nick Sagalkin (GOA Plan Team ADF&G), Sarah Gaichas (GOA Team AFSC REFM) Jane DiCosimo and Diana Stram acted as lead rapporteurs and Jim Ianelli served as moderator for the discussions.

The Teams welcomed new member nominees Leslie Slater (BSAI and GOA, USFWS), Mary Furuness (BSAI, NMFS AKRO) and Dave Barnard (BSAI, ADF&G). Other nominations under consideration include Dana Hanselman and Alan Haynie (BSAI, AFSC) and Paul Spencer and Mike Dalton (GOA, AFSC). The Teams reviewed changes to the draft agenda. The final agenda (in strike out to note changes) is attached.

Members of the public and State and Agency staff in attendance included: Julie Bonney (AGDB), Jon Warrenchuk (Oceana), Lori Swanson (GFF), Anne Vanderhoeven (BBEDC), Mike Symanski (FCA), Kenny Down (Freezer Longline Coalition), John Gauvin (Best Use Coop), Donna Parker (Arctic Storm), Kristin Mabry (NOAA), Glenn Reed (PSPA), Mark Maunder (Quantitative Resource Associates), Jack Tagart (Freezer Longline Coalition), Nick Delaney (Alaskan Leader Fisheries), Jason Anderson (Best Use Coop), Mike Perry (Blue North Fisheries), Paige Drobny (UAF), Bob Lauth (NOAA AFSC), Bill Clark (SSC), Chris Rooper (AFSC), Chris Lunsford (AFSC/ABL), Paul Spencer (AFSC/REFM), Steve Barbeaux (AFSC/REFM), Ed Richardson (APA), Mark Zimmerman (AFSC REFM), Anne Hollowed (AFSC REFM), Henry Cheng (WDFW), Gary Stauffer (FSA), Craig Faunce (AFSC/FMA), William Stockhausen (AFSC REFM), Suzanne McDermott (AFSC REFM), Jack Turnock (AFSC REFM), Martin Loeffland (AFSC).

Species information system:

Grant Thompson provided an update on the NOAA species information system for internal use by NMFS and requested information regarding which species might be assessed for the first time prior to 2010. The following species were highlighted as either new assessments or probable new assessments in that time

frame: Sharks in both areas (2010), GOA other species (4 assessments) in 2009, 2 species of rougheye rockfish (GOA).

Current Council activities

Jane DiCosimo provided a written overview of current Council activities (handout). She noted that this document will be updated annually and posted on the Council website. Team members and the public discussed the status of various amendments. Julie Bonney expressed concerns regarding the assessment for dark rockfish and the need for State coordination to assume management responsibility.

Team members expressed concerns regarding the delay in pursuing an amendment to protect grenadiers by moving them into specified category. Jon Heifetz felt that this should have a higher priority for action because they caught in the surveys in large numbers (indicating potential large biomass), and are as biologically vulnerable as other species such as skates which are scheduled for action in 2009. There is good survey information on grenadiers and a stock assessment has been completed. Giant grenadiers are the most abundant species at depths of 200-1000 m on the slope and are of great ecological importance. Several members supported a higher priority for action on grenadiers to ensure adequate protection for this species. Jane DiCosimo noted that management of non-target species (including grenadiers) was awaiting resolution under proposed revised guidelines for National Standard 1. The grenadier assessment author intends to update the assessment this year and to the extent possible will include all catch information necessary to facilitate an analysis for moving this species into the FMP as a specified species.

Rockfish working group

Paul Spencer provided an update on the status of the rockfish working group and on-going rockfish research. Chris Rooper provided an overview of the status of an NPRB-funded project for continued work on assessing rockfish in untrawlable areas using acoustics. This project is scheduled for April in Kodiak using the Oscar Dyson. Chris Wilson noted this is tentatively scheduled as the availability of the Dyson is currently uncertain. The Teams continue to recommend that the issue of trawlable versus untrawlable grounds is a priority, particularly in the GOA.

Chris Wilson provided additional information on the research objectives including using remote sensing equipment including multi-beam systems (acoustic devices) to get estimates of rockfish in untrawlable habitat including multi-beam systems. They are trying to better characterize the morphology of rockfish schools for species identification. Improved acoustic estimates of abundance will be sought and a new devise employed to scale acoustic estimates to actual estimates of abundance. Chris Rooper is modifying a semi-pelagic trawl in conjunction with drop camera work to better evaluate these areas. A suite of new experiments will evaluate these untrawlable regions.

Paul Spencer decribed his plans to conduct additional NPRB funded research on rockfish. The focus of this study is primarily on to evaluate survey designs and sampling of Pacific ocean perch. A 'mini-survey would be conducted to investigate improved survey designs and for evaluating the use of hydroacoustics to improve survey estimates.

Research Priorities

Jane provided an overview of the Council's schedule and plans with respect to five-year and one year research priorities. The Team requests consideration of how timeframes for these priorities are determined between one and five-year prioritization. The Team has the ability to comment on this year's review for September as well as the cycle for next year's priorities.

The Team agreed to break out into individual workgroups on an annual basis to revise research priorities. Pat Livingston provided additional information on the documentation and relative goals of annually revising research priorities by the SSC (and the Plan Teams prior to SSC recommendations). The five-year list which the SSC will produce in October will include different categories of prioritization (1 and 2 for highest and next level of priority).

The Teams will break into workgroups over the winter to revise research priorities accordingly. Council staff and the BSAI and GOA chairs will put together workgroup assignments following the SSC's October meeting and resulting 5 year research priorities list. Further communication with the Teams on this assignment will be by email following the October SSC meeting.

Annual Catch Limits

Jane DiCosimo and Grant Thompson summarized the status of the ACL proposed rule and its current application to the North Pacific groundfish FMPs. Three working groups were designated by HQ to assist in providing technical guidance on application of the ACL requirements for FMPs. No change will occur this year in specifications and any modifications to FMPs are unlikely for several years. Statutory requirements indicate that all changes must be made to amend FMPs by 2010 (for overfished stocks) and 2011 (all other stocks). Further information will be provided to the Teams as it becomes available.

Proposed specifications

The key task for Plan Team deliberations at this meeting is to recommend proposed specifications for the 2 year cycle (2009/2010) and ensure that these are the best available for meeting public notification requirements for proposed rules. The Teams discussed the process if the proposed rule varies substantially from the final rule. Mary Furuness clarified that if NOAA General Counsel determines that a new proposed rulemaking is necessary, the regulations for implementing these specifications would be delayed accordingly. New rulemaking should only apply for the individual stocks for which proposed and final rulemaking were different.

The Teams will recommend proposed specifications in individual Team meetings.

Tier 1 projection methodology

The status of the stock in the projection year determines stock status for both application of the control rule as well as for stock status determination. NMFS HQ has determined that this forward projection is appropriate for application of the control rule but that the current year (not the next year) is to be used for stock status determination.

Jim Ianelli provided a Tier 1 projection simulation analysis for EBS Pollock and BSAI yellowfin sole. This study entailed comparing two different "true" productivity assumptions managed under Tier 1 compared to Tier 3 for the two stocks.

Mark Maunder questioned why different assumptions of stock productivity result in similar long-term results and why the projection policy is robust to that assumption. It was noted that the sloping harvest control rules (adjusting fishing mortality downwards as the stock drops below target levels) employed for these stocks which, coupled with overall caps (in this case 1.5 million t for pollock and 250 thousand t for yellowfin sole), result in stock levels that are similar for the different policies. It was also noted that between these two stocks and scenarios, one stock is currently below the long term average (pollock) while the other is above (yellowfin sole). This provides some contrast and specific to yellowfin sole, the issue of how future catch rates in the fishery under lower population densities would be lower was discussed.

Survey update

Bob Lauth reported on the EBS Shelf Bottom Trawl Survey. Bottom trawl survey objectives are to 1) collect data to generate up-to-date estimates of biomass, abundance and population structure of crab and groundfish populations in support of stock assessment and ecosystem forecast models and 2) improve understanding of life history of the fish and invertebrate species and the ecological and physical factors affecting their distribution and abundance. Sea surface and bottom temperatures were nearly the coldest recorded in 25 years. Only one out of 376 tows was not successful. Survey biomass estimate of pollock was 3.03 M mt (for all strata) wheras the estimate for Pacific cod was 428,000 mt. Survey biomass estimates for rock sole was 2.03 M mt, 2.1 M mt for yellowfin sole, 530,000 mt for arrowtooth flounder, 510,000 mt for Alaska plaice, 13,500 mt for Greenland turbot, and 362,000 mt for Alaska skate.

Nineteen special projects were conducted as part of the EBS Shelf Bottom Trawl Survey 1) MACE acoustic data collection, 2) BSIERP oceanographic sampling, 3) Light effects on pollock distribution, 4) Alaska skate tagging, 5) Summer zooplankton abundance, 6) Reproductive potential of commercial crab species, 7) Length/weight relationships of commercial crab species, 8) Snailfish taxonomy and food habits, 9) Trophic interactions and feeding ecology, 10) Alaska skate age and growth, 11) Octopus life history, 12) Gadoid liver seasonal energy reserves, 13) Characterization of benthic infauna community, 14) Bitter crab syndrome, 15) Icthyophonus in walleye pollock, 16) Energy content and diet of forage fishes, 17) Improving trawl gear monitoring, 18) DNA barcoding of Alaska marine fishes, and 19) King crab population dynamics.

Bob also reported on the Eastern Bering Sea Upper Continental Slope Bottom Trawl Survey conducted during 29 May – 11 August 2008. There were 200 successful tows on the 70 day charter. Results included identification of 146 fish species and 251 invertebrate species, a number of taxonomic changes for S. melanostictus and S. aleutianus, B. brunneum and B. zestum , and L. beringius. There were new species of snailfishes & lithodid crab identified and numerous range extensions.

A vessel comparison study between the Miller Freeman (MF) and Oscar Dyson (OD) was summarized by Alex De Robertis. He identified the following issues 1) the OD is noise-reduced, the MF is not, 2) noise reduction is aimed to reduce vessel avoidance by fish, and 3) the OD will conduct pollock surveys traditionally conducted by the MF. The key question as the OD replaces the MF, is that given that the OD is designed to minimize vessel avoidance, how do abundance estimates from the different acoustic surveys from each vessel compare? Vessel comparison field experiments were designed to collect data on aggregations of pollock in several ways: 1) with the two vessels running beside one another at a distance of about 0.5 nmi, 2) with one vessel following nearly directly behind the other at a distance of about 1 nmi, and 3) each vessel repeatedly running past a free-drifting acoustic-buoy (i.e, a buoy equipped with an echosounder). In summary 1) biomass estimates of winter spawning concentrations from Shumagins and Shelikof surveys were significantly affected by use of the noise-reduced vessel. Bogoslof survey was not. The effect was less for fish that were deeper (i.e., Bogoslof - no significant difference, Shelikof ~20%, Shumigans ~30%, 2) biomass estimates during daytime summer (2006, 2008) surveys the eastern Bering Sea were not affected by use of the noise-reduced vessel (EBS), 3) reaction to MF > OD was confirmed with acoustic buoy work during winter Shumagin survey, 4) buoy study also suggests that absolute reaction of pollock to OD appears to be relatively small, 5) differences are attributable to differential vessel avoidance, not measurement bias, and 6) analysis is underway to evaluate impact on stock assessments. One team member suggested combining all study results to test for area, depth, and vessel effects.

The Teams suggested that it may not be accurate to say that there was not a significant difference in the Bering Sea. One Team member suggested that all three results be tested together. It was noted that the BS

is shallowest but has the weakest effect. Increases were noted by area, depth, and vessel. Not sure I got Mike's main point here

Libby Loggerwell reported on the Cruise Report for the 2008 Beaufort Sea Survey conducted during July 27 – August 30, 2008. The results of the survey will provide estimates of abundance, species composition and biological information of marine fish and invertebrates, oceanographic properties and information on the macro- and micro- zooplankton communities. The specific objectives of the survey was to 1) quantify the distribution, abundance, and biological condition of important offshore marine fish species, 2) assess the biology, behavior, and dynamics of key ecosystem components for ongoing scientific research, and 3) recommend methods for future monitoring that could provide time-series and data trend information necessary to support offshore development decisions and serve as a proto-type fisheries component of future MMS or other ocean observing systems.

Of particular interest to the Teams, fish comprised 6% of the total weight captured in the bottom tows of which 38 species of fish were identified. Arctic cod were the dominant catch in the mid-water hauls by weight and numbers. The second most prevalent species in the mid-water hauls were jellyfish. Invertebrates made up 94% of the total weight captured in the bottom tows of which approximately 174 species were identified. Invertebrates made up 94% of the total weight captured in the bottom tows of which approximately 174 species were identified. Data on the distribution and abundance of seabirds were collected during the transit to and from Dutch Harbor and during the acoustic transects, when conditions allowed. Arctic terns, black-legged kittiwakes and phalaropes were the top three seabirds in terms of abundance. Opportunistic marine mammal sightings were recorded. Highlights included an adult polar bear (presumably female) and two cubs on the ice near Pt. Barrow. A swimming polar bear was also observed in the same area. Large numbers of gray whales were observed during the transit to and from the study area, in the Chukchi Sea/Bering Strait area. They appeared to be feeding. No confirmed bowhead whale sightings were made during the transit or in the study area.

Potential reductions in 2009 Alaska fishery resource assessment surveys

The Plan Teams are concerned that a reduction in the number and duration of NOAA surveys will negatively impact Alaska fishery stock assessments. NOAA surveys are an integral part of these assessments. These surveys are conducted annually or biennially and provide important time series of information on ichthyoplankton, fish and shellfish.

NOAA surveys were reduced in 2008 relative to previous years. In 2008, the Aleutian Islands bottom trawl survey was eliminated and the Bering Sea surface trawl survey (BASIS) was reduced by about two thirds. Further reductions may occur in 2009. These reductions would significantly impact Alaska fishery stock assessments and our ability to estimate stock condition and recommend catch quotas. Continuation of the standardized NOAA surveys are necessary for the successful management of Alaska groundfish and shellfish fisheries and to reduce uncertainty. As uncertainty increases, generally risk-averse strategies require further reductions in harvests.

Gulf of Alaska and Aleutian Islands bottom trawl surveys

Gulf of Alaska and Aleutian Islands bottom trawl surveys occasionally have been reduced when funding was limited. In cases when this has happened, certain geographic or depth strata were eliminated from a survey. For example, in 2001 the eastern Gulf of Alaska was not surveyed during the Gulf of Alaska bottom trawl survey. Eliminating area or depth strata makes completing the stock assessment more difficult. Stock assessment models depend on a time series of standard surveys. Standardization includes sampling the same area and depths each survey year. If an area or depth strata is missed, the stock assessment authors must extrapolate the missing abundance data, which if occurring frequently, is untenable.

Two alternate approaches avoid this problem. Both approaches involve surveys that completely cover the standard area and depths. One approach is to increase the interval between complete surveys. For example, the current survey interval is biennial. An alternate approach is to conduct triennial surveys. The second approach is to reduce the station density ("thin" the survey effort) and cover the standard area and depth. If survey effort must be reduced, the Plan Team advocates "thinning" survey effort to maintain survey geographic and depth coverage intact. Reducing station density will decrease precision of biomass estimates, so this trade off should be evaluated when allocating survey effort. For example, a minimum number of stations should be maintained in each survey strata in strata that are small in size.

Marine Mammal update

Lowell Fritz provided a summary of Steller sea lion and northern fur seal field research conducted by the National Marine Mammal Laboratory in 2008, which included an aerial survey across the Alaska range of Steller sea lions to get index counts of adults and juveniles, and a mark-resampling effort to estimate pup production by northern fur seals on the Pribilof Islands. Data collected during these field efforts is currently being analyzed and results will be made available for the November 2008 Plan Team meeting. A summary of a multi-year effort (NPRB project of Springer et al.) to compare female foraging strategies on declining (St Paul on the Pribilofs) and increasing (Bogoslof) rookeries was also provided. Females from Bogoslof make shorter and more frequent foraging trips than females from St Paul, allowing more frequent nursing opportunities for their pups. As a consequence, Bogoslof pups were heavier on average than those from St Paul at weaning, which could give them a survival advantage during their first year.

Lowell also reported on Steller Sea Lion Distribution and Food Habits study in the Central Aleutians during 16 March – 12 April 2008. The objective was to develop tools to manage fisheries at local scales 1) through cooperative research with industry and 2) assessing local impacts of fishing on prey availability for top trophic level consumers. Pollock has a relatively low frequency of occurrence overall in the diet of Steller sea lion in the AI (annual, broad area average is < 10%), but could be a larger part of the diet for a limited time in central Aleutian Islands near pollock spawning aggregations.

Squid presentations

Squid life history characteristics
Paige Drobny summarized her thesis on life history characteristics of squid in the Eastern Bering Sea. Her research concluded 1) *B. magister* in the EBS have a one year life cycle and may be a sub-species; 2) the onset of maturation changed from a long juvenile phase and compressed maturation time to a shortened juvenile phase, earlier onset of maturation and a longer time spent maturing, and 3) statolith chemistry in the BS is a viable tool to analyze spatial and temporal squid distribution.

Trophic role of squid in the EBS.

Mary Hunsicker summarized her ongoing dissertation research on squid in the BS ecosystem. Her research concluded 1) *B. magister* may play important ecosystem role as a competitor; 2) its trophic position is similar to pollock; 3) eye lens method may be a valuable tool in understanding ontogenetic changes in trophic level of squid. Next research steps include 1) construct size-structured food web models; 2) quantify the predatory/competitive impact of *B. magister*, and 3) evaluate the effects of squid predation/competition under alternative management scenarios.

Octopus Discard Mortality experiment

Liz Conners presented a new approach for catch accounting for octopus to prevent possible closures once separate specifications for octopus are set under planned amendments to the BSAI and GOA groundfish fishery management plans (FMPs). The Teams endorsed the use of gear specific discard mortality rates (DMRs) in catch accounting for octopus, similar to Pacific halibut management. These could be achieved through a regulatory amendment or in the planned FMP amendments to remove octopus from the other species complex (although no date has been identified for the preparation of these amendments). The Teams did not support a proposed alternative where catch accounting was not modified but fishery closures were relaxed, as this would allow total catch to exceed specifications. Currently there are no maximum retainable amounts in the GOA. Nearly all GOA pot octopus catches are retained. Pot fisheries could be exempted from possible octopus MRAs. The Teams encouraged further development of studies and/or data collection to document octopus mortality rates.

Sablefish

Dana Hanselman and Chris Lunsford provided an overview of sablefish issues for the November assessment. A CIE review is planned for 2009, thus major modifications to the assessment will not be done this year.

Selectivity

Some minor modifications to the assessment examined for this year include selectivity changes in order to improve model stability. Dana noted that trawl fishery selectivity for males appeared misspecified previously and not biologically reasonable. Mike Sigler commented that trawl survey data at higher ages are infrequent thus age data might support this rapid decline in age selectivity. There was a minimal change in overall model fit with a reduction of 8 parameters and minimal impact to biomass and reference points. The Team supports the move towards using a gamma function for estimating the selectivities.

The Team discussed the ability to retain additional catch in the rockfish pilot program and under amendment 80 given management changes in recent years.

Pot cannibalism study

This study was completed at the request of the Council. No sablefish were found in any of the stomach samples obtained for the study (257 stomachs). This appears to indicate that pot cannibalism is a rare event. No ototliths in stomachs were recorded in the study. Some caveats noted include soak times for the study, and the possibility that stomach contents were purged when pots were retrieved. Given these results and the indication that pot cannibalism is a rare event, no further study of this issue is planned.

Sablefish Longline Survey

Chris Lunsford presented an overview of the sablefish longline survey. He described background information on the survey (cost recovery), survey stations and sampling design and lengths collected on the most recent 2008 survey. Jon Heifetz noted that trying to differentiate between the two species of rougheye rockfish on this survey was particularly difficult given the location of the survey off Yakutat where the species notably are mixed. Ken Goldman provided information on a potential genetic

methodology to differentiate on board between species. He will provide contact information to Jon for further investigation of the application of this methodology to rockfish.

Chris noted that while general overview of preliminary catch results from the survey were provided, final information will be forthcoming to assessment authors shortly.

While no specific studies are reported at this time on whale depredation, this continues to be monitored with increased focus on observations of depredation in the survey and in the fishery.

An experiment was done on the survey this year evaluating hand-baiting versus auto-baiting given the increased use of auto-bating in the fishery. One concern raised previously in auto-baiting is the uncertainty that each hook is baited. Results indicated that sablefish catch rates were substantially lower with auto-bait gear. The survey will continue to use hand-baiting in the survey in order to maintain consistency with previous catch-rate results. Members of the public commented that their observations were that hand-baited lines tend to find pockets of sablefish in rough bottom since there is more slack in the line than auto-baited lines that tend to clothesline and are not as successful at locating sablefish.

Jon Heifetz noted that a special project was undertaken on this survey to try and differentiate between the blackspotted and rougheye rockfish. Telling the two species apart was particularly difficult given the location of the project area off Yakutat where the species notably are mixed. Ken Goldman provided information on a methodology to differentiate on board between species. He will provide contact information to Jon for further investigation of the application of this methodology to rockfish.

Pacific cod

Grant Thompson provided an overview of alternative models being considered for the Bering Sea and GOA pacific cod stocks. Grant provided an overview of previous assessment modeling for these stocks and the timeline and reviews in modifying the assessments in the last several years. He discussed various recommendations for both regions by BSAI and GOA Plan Teams as well as the SSC and the policy for external reviews (and public interaction policy) for this assessment.

Additional features to the BS model this year include: fishery selectivity blocks chosen by Akaike Information Criterion (AIC) (5, 10, 20, no block); lower bound of the descending width in the selectivity parameters = 5 (sticking to uniform priors but adjusting the bound); regime-specific recruitment deviations (dev) vectors specific to the environmental regime; the input standard deviation of those (sigmaR) set equal to the estimated devs from current regime (rather than being tuned to the entire time series as previously); number of freely estimated initial ages determined by AIC; and size at age data in model used only if long-term survey size modes are ambiguous.

Bounding the minimum of "width" factor is one reasonable approach to ensuring the selectivity function changes in a regular way. A choice of the value of 5 for the length selectivity function seems reasonable based on the material presented by Grant. Grant noted that this is equivalent to ensuring that the distance between the maximum and the inflection point of the ascending limb of the selectivity function is 8 cm. This bound also was applied to the age selectivity function, which is equivalent to a "width" of 8 years. However this bound sometimes is not equivalent for the two selectivity functions. For example, when cod are young and growing quickly, the length bound will represent about one year and several years when cod are older and growth slows. This discrepancy may affect estimation of selectivity functions in unforeseen ways. The Plan Team recommends that the assessment author examine whether the minimum "width" bounds are being reached during model estimation and if so, adjust the minimum "width" bound to examine the effect of this bound on model results.

The Team discussed the selectivity pattern as prescribed in the model. In response to Plan Team comments a selectivity curve was employed which uses fewer parameters. Alternative M values were investigated. After evaluating different alternative M values, the value derived from the Jenson method with Stark's maturity data was selected for the model (M=0.34). Jack Tagart requested information on the precision of this estimate.

Mark Maunder questioned the difference between model estimates of length composition and the age data length composition which relate to estimates of natural mortality and relation to maturity schedule in the model. Grant commented that he is still unsure why the estimates of mean length at age from the model and the age data differ.

Bill Clark commented regarding the trawl survey selectivities from model 4 noting the large spread. Model 4 has one more free parameter than others. No apparent trend is detected.

Three models are under consideration in GOA. Exploratory model 3 differs from BS model 5 in the following:
Size at age data included, survey size comp and age comp downweighted, each year's survey abundance index split to separate fish less than 27cm and fish greater than 27cm., survey split into different eras, Q (survey catchability) fixed post 1993 and freely estimated prior to 1996 for the 27-plus survey and freely estimated for all years of the sub-27 survey.

Maunder questioned the age data from the GOA and noted that the observed pattern does not appear to be consistent with the assumptions. He questioned if the missing age 2 in the data consistent with the assumption.

Grant requested specific feedback from the Teams on a number of issues related to modifications and changes as presented in his current model explorations.
Mike Sigler noted that the bound on age and length could be checked to see if the model bumps up against bound. He felt that Grant did a good job justifying the selection of the value of M using the most contemporaneous information.

Jon Warrenchuck commented that it would be helpful to understand how the models change the control rule thresholds (e.g., with respect to unfished biomass), and asked if this could be included in tables for November. Grant notes that this type of information relative to ABC recommendations are included in November drafts but that September discussions tend to focus on methodology.

Mark Maunder questioned the estimate of Q in BS model 5 when adjusted for selectivity of fish in the archival tag study. Grant responded that the average of the product of catchability and selectivity across the 60-81 cm size range is higher than Dan Nicol's estimate of Q.

Mark questioned the estimates of recruitment in 1977 and to what extent is this reliable given that it is included in the average and used for MSY reference point calculations. Grant noted that there has not been any disagreement about the relative size of the 1977 year class (give or take a year); thus there seems no reason not to include.

Jon Heifetz requested general clarification on parameters that are pinned to bounds and how are they estimated. Grant commented that if the estimate is pinned then it is set at bound. Mark Maunder commented that the reasonableness of bounds should be investigated and if found to be unreasonable then should be further investigated. Jon requested a listing of these parameters in the final assessment. Grant noted that this table is a standard feature of the final assessment.

The Plan Team commented that the assessment author attempted to reduce number of selectivity parameters to the extent possible but this model is still overly complicated as a result of the software being used. A simpler selectivity parameterization was suggested, e.g. exponential logistic. SS2 notably does not allow for this in the present software. The Plan Teams requested that the selectivity function be further simplified even if it means modifying SS2 accordingly.

Jack Tagart commented on input parameter estimation issues with M and a suspected bias. This bias in L50 may affect the maturity since there appears to be some aging error (bias in ages) that may propagate through to the estimates of natural mortality. Questions remain regarding accuracy in age data and impacts on natural mortality (Stark data).

Dana Hanselman commented that everything seems dome shaped in the model and what information is available to indicate the presence of larger fish not being caught. The trawl survey model is assumed to be asymptotic.

Dana asked if it is possible that allowing annual variation in the ascending limb of survey selectivity could be masking recruitment signal in survey. Grant commented that this is possible in the very short term, which is one reason not to place too much emphasis on the model estimate of a year class that has been observed in the survey only once.

Team members noted that an aging error matrix is included in the model, and it might be possible to use this to address Tagart's concern on bias. Can the age-bias be tested? Grant noted that, while it is theoretically possible to estimate bias iteratively within the model, no external estimate of bias is possible due to the absence of data on "known age" fish.

The Team's responses to Grant's specific questions are provided below:

1-BS Model 1: This model represents a general improvement from previous iterations. Mark Maunder commented that he believes Model 1 is misspecified, because a simulation analysis from this model result indicated that, if the natural mortality rate were freely estimated using simulated data, the estimate tended to be biased low. Model 5 seems to be an improvement in model specification over 1.

2-Does Fixing L2 outside the model help: No

3-Can fixing parameters simplify selectivity: Yes, but efforts should be made to simplify further, preferably with a different parameterization. Note this is not feasible for November thus in the meantime selectivity as currently configured in model is acceptable(Team members expressed varying views here, not sure how overall assessment results varies due to this). Jim suggested showing catch to all other gear types as a diagnostic of availability of size groups to different gears. Mark Maunder commented that model 3 needs further investigation as more parameters are fixed than initially intended. Mark said that an option is available in SS wherein setting the parameter governing selectivity of the oldest fish at a value of 999 changes the shape of the curve somehow, but he was not sure of the functional form.

4-Should unique features of model 4 be used? The general impression that while some features of this model may be useful for comparison with other models and for contrast in the assessment, none are recommended to be brought forward for specification purposes.

5-Is setting the lower bound of 5 on width appropriate? The Plan Team recommends that the assessment author examine whether the minimum "width" bounds are being reached during

model estimation and if so, adjust the minimum "width" bound to examine the effect of this bound on model results. See additional discussion of this earlier in minutes.

6-Is the method used to define blocks appropriate? Yes

7-Do the new model Models fix average recruitment problem used for the projections? Yes.
Is age-based selectivity appropriate for survey? Question raised on the consistency of 2 year olds in the GOA survey (lengths absent but ages present).

8- Have input sample sizes been set appropriately? The Teams noted that further investigation on sensitivity of sample sizes is warranted.

9-Should size at age data be included? No for BS, yes for GOA.

10-Should GOA survey be split by size? This seems to be a good idea but need to check on issues related to age 2.

11-Are appropriate values of M being used? Generally yes and well justified now, current data being used and clean understanding of how calculated (see discussion of bias potential and the use of Jensen's equation with Stark's data).

The Teams noted that it was difficult to provide feedback on models that should or should not be carried forward for the November meeting given the time available and the complexity of the issues, particularly between the BSAI and GOA. The author sought advice on this specifically and the Teams hope that the SSC could provide more feedback.

Center for Independent Experts (CIE) report for Aleutian Islands pollock and Atka mackerel

Jim Ianelli noted that the CIE review completed this summer is available as three separate reports and made available to the Plan Teams along with the response from AFSC scientists. The response paper (available at ftp://ftp.afsc.noaa.gov/afsc/public/Plan_Team/draft_assessments.htm) provides a table of categorized CIE review comments along with plans for analysis. Due to limited time available for a full presentation to the Teams, Ianelli invited comments from members on these documents and asked that they be considered during the current assessment cycle.

Electronic Monitoring (EM) for catcher vessels

Electronic monitoring (EM) is being considered for implementation on catcher vessels for AFA pollock and the Rockfish Pilot Program (RPP) *only*. For these fleets, the EM system appears to be reliable for validating full retention and monitoring the time and location of fishing operations. Additionally, preliminary results from the RPP indicate that the EM system can be used to quantify at-sea discards of halibut. Adopting an EM model for the trawl catcher vessel sector would result in catch accounting and biological data collection occurring exclusively at plants (landing sites). Considerable discussion followed on whether an EM system would replace observers on vessels and what aspects of information currently gathered by observers would be unavailable. Martin Loefflad (FMA) clarified that there can be a mix of observer coverage and implementation of the EM system. Concerns centered around the loss of haul specific catch information, the ability to collect biological data, and the cost effectiveness of implementing this system. It was pointed out that the use of GPS and the placement of sensors on hydraulic equipment and winches could provide detailed information on fishing activities and locations. Concerns were expressed about the loss of haul by haul information which may impact EFH analyses, species association information, catch information from critical habitat, and ability to look at localized

depletion. Concern was also raised about who bears the cost (in terms of money and manpower) for viewing and analyzing the EM video data. It was pointed out that the infrastructure to appropriately implement an EM system for AFA pollock and the RPP is currently not in place.

Economic SAFE Report

Ron Felthoven noted that Alan Haynie and Mike Dalton have been nominated to the BSAI Team and GOA Team, respectively. Ron summarized the Economic SAFE Report.

Three data collection and synthesis studies (1) Crew Participation Data Collection System for Commercial Fisheries off Alaska, 2) Integrating Bering Sea and Gulf of Alaska Climate Data for Socioeconomic Research, and 3) Predicting Fishing with Vessel Monitoring System (VMS) Data).

Five Recreational Fisheries and Non-Market Valuation studies (1) Alaska Recreational Charter Boat Operator Research Development, 2) Demand for Halibut Sport Fishing Trips in Alaska, 3) Non-consumptive Value of Steller Sea Lion Protection; 4) Economic Impacts of Alaska Saltwater Sport Fishing, and 5) Protected Marine Species Economic Valuation Survey.

Three Models of Fishermen Behavior, Management and Economic Performance (1) A Method for the Design of Fixed Time-Area Closures to Reduce Salmon Bycatch, 2) Evaluating the Cost and Effectiveness of Fixed and Rolling Bycatch Closures in the Bering Sea, and 3) Climate Change and Changing Fisher Behavior in the Bering Sea Pollock Fishery.

Two Regional Economic Models (1) Estimating Economic Impacts of Alaska Fisheries Using a CGE Model, and 2) Examining Dynamic Impacts of Alaska Fisheries within a Time Series Modeling Framework).

Five Socioeconomic, Cultural and Community Analyses (1) An Analysis of Place, History, and Globalization in Unalaska/Dutch Harbor, 2) Bering Sea and Aleutian Island Communities: Demography in a Changing Ecosystem, 3) Community Profiles Published for Washington, Oregon, and Other U.S. States Showing Involvement in West Coast and North Pacific Fisheries, 4) Developing Socioeconomic Indicators for the Eastern Bering Sea Trawl Fishery, and 5) Culture and the Globalized Labor Force in the Alaska Seafood Processing Industry: the Company Cafeteria.

Ron presented a brief overview of 2007 fishery statistics.
2007 Commercial groundfish catch dropped slightly to 2.0 million mt
Ex-vessel value for groundfish decreased slightly from $830 million to $746 million
1. Groundfish accounted for 50% of total Alaska ex-vessel value
2. Salmon accounted for 23%
3. Halibut accounted for 14%
4. Shellfish fishery accounted for ~12%
Species
- Pollock catch of 1.41 million t (or 69%) was down from 71% in 2006; levels dropped 10%
- Flatfish (yellowfin sole, rock sole, and arrowtooth flounder) catch of 256K t (or 13%) was up from 11% in 2006; levels up 10%
- Pacific Cod catch of 225K t (or 11%) was the same % as 2006; levels dropped 6%
- Sablefish, rockfish and Atka mackerel make up the majority of the balance (~7%)
Gear
- Around 91% of total catch is linked to trawl gear
- Hook and line accounted for 7.4% of catch
- Pot gear accounted for 1.7% of catch

- Most of the catch for any given species occurs using one particular type of gear (around 90%, on average, is taken with that gear type), except Pacific Cod
- 42% by trawl
- 44% by hook and line
- 14% by pot

Sector

Catcher vessels - 45% of total groundfish catch; 49% of total ex-vessel value

Catcher-Processors - 55% of total groundfish catch; 51% of ex-vessel value

- Catcher vessels take larger proportion of higher-priced species such as sablefish
- Gear choice; big CPs do more trawling
- While trawl gear accounted for 91% of total catch, 70% of ex-vessel value, much of the catch is of low-priced species such as pollock

Discards

- Groundfish discard rates increased slightly from 5.3% in 2006 to 6.0% in 2007
- 11.9% in GOA v. 5.4% in BSAI
- Represents 54% decrease from 1997
- Discard rates higher for fixed gear than for trawl gear
  1. 10.8% for fixed gear
  2. 11.4% BSAI, 9.1% GOA
  3. 5.6% for trawl gear
  4. 5.0% BSAI, 12.8% GOA

The Teams recommended that the Economic SAFE report summary also be regularly provided to the SSC, AP, and Council, perhaps at each February meeting. Jim Ianelli requested that Ron's group investigate the potential for economic factors to affect appropriate catch levels in the BSAI yellowfin sole fishery, in which the catch is high and the stock is level: how much harder will it be to catch fish when the density is halved? This is an issue facing the Council as it adjusts TACs under the 2 million mt OY cap.

Members of the public commented on the VMS study and "cafeteria" study.

Ecosystem Considerations

Jennifer Boldt updated the Teams on the Ecosystem SAFE chapter and ecosystem assessments. In summary 1) coastal N. Pacific was cold, 2) westerly winds increased N. Pacific current, 3) proportionately less transport into GOA, 4) upwelling along AI, 5) GOA eddies transport phytoplankton, heat, salinity, nutrients cross-shelf, 6) lots of ice in BS (not Arctic), 7) increased BS zooplankton biomass, 8) age-0 pollock constricted to middle domain in cool years, 8) juvenile sockeye constricted to inner Bristol Bay in cool years, 9) age-0 pollock diets switch from pollock to euphausiids in cool years, 10) springtime wind-driven advection may favor strong 2008 northern rock sole year class, 11) short-tailed albatross found along BS shelf edge, 12) black-footed albatross found over GOA shelf, 13) 82% BSAI fishing communities had increased population, 14) groundfish dominated community in nearshore GOA.

Recent improvements to the Ecosystem Assessment synthesize ecosystem information by linking important ecological responses to changes in climate and human use drivers. A 'short' list of key indicators to track changes in the EBS, AI, and GOA uses a stepwise framework, the DPSIR (Drivers, Pressure, Status, Impacts, Response) approach. The report addresses four objectives based, in part, on stated ecosystem-based management goals of the NPFMC 1) maintain predator-prey relationships, 2) maintain diversity, 3) maintain habitat, and 4) incorporate/monitor effects of climate change. Candidate indicators are based on qualities such as, availability, sensitivity, reliability, ease of interpretation, and pertinence for addressing the objectives. In future drafts, we plan to more fully address the human

responses to changes in status and impacts. This DPSIR approach will enable the Ecosystem Assessment to be in line with NOAA's vision of Integrated Ecosystem Assessments.

Kerim Aydin reported that the Resource Ecology and Ecosystem Modeling staff was concentrating on developing an ecosystem assessment that would provide a succinct report of ecosystem function and trends by functional guild for the November Plan Team meeting. The Team also expected to update ecosystem considerations for the EBS and GOA pollock assessments and work with other stock assessment authors as requested. No other priorities for species updates were identified by the Plan Teams.

Bering Ecosystem Study (BEST) - Bering Sea Integrated Ecosystem Research Program (BSIERP)

Ninety federal, state and university scientists are studying a range of subjects in the Bering Sea ecosystem, from atmospheric forcing and physical oceanography to humans and communities, including the attendant economic and social impact s of a changing ecosystem. The overall research objective is to improve understanding of how the Bering Sea may respond to climate change, particularly as mediated through changes in seasonal sea ice cover. The project is supported by the North Pacific Research Board (NPRB) and the National Science Foundation (NSF) and includes significant in-kind contributions from NOAA and USFWS. NPRB supports several study components including oceanographic moorings, fish, whales, seabirds, trophic interactions and local and traditional knowledge. NSFsupports complementary oceanography and lower trophic level research. Mike Sigler reported on the fieldwork which began January 2008 and is planned to continue until September 2010. http://bsierp.nprb.org/

Bob Foy provided a research update on **ocean acidification**. Authors finalized and published (AFSC Process report) a research plan for ocean acidification research at AFSC. (Sigler et al. Forcast fish, shellfish, and coral population responses to ocean acidification in the North Pacific Ocean and Bering Sea http://www.afsc.noaa.gov/Publications/ProcRpt/PR2008-07.pdf). Ocean acidification research plans have also been developed at NOAA Fisheries national level. Currently AFSC programs are awaiting funding availability to get fully invested in ocean acidification research. The Kodiak Laboratory staff have just finished the 3rd year of research on the effects of acidification on crab larvae in the North Pacific. Recent publications show that the North Pacific shelf is already likely impacted by acidification effects (shallow calcium carbonate dissolution depth). Low level research will continue at AFSC with hope for increased funding in 2010.

GOA pollock management strategy evaluation

Martin Dorn summarized Teresa A'mar's management strategy evaluation study of GOA pollock. This study is part of the larger initiative at the AFSC to evaluate current harvest policies and provide tools for developing alternatives policies that are robust to climate change and regime shifts. She evaluated impacts of long-term climate change on stock dynamics and management performance using output from a suite of models developed under the auspices of the International Panel on Climate Change (IPCC) to predict global climate over the next fifty years. Although the current management strategy meets management goals under a stable environmental conditions, performance is uneven when regime shifts or climate variability are incorporated. The management strategies in which target biomass levels attempt to track changing environmental conditions have better performance under climate variability, but such strategies will require accepting large fluctuations in target and limit reference points.