BSAI Groundfish Plan Team Minutes
AFSC- Seattle, WA
November 17-21, 2008

Loh-Lee Low (AFSC), Chair
Grant Thompson (AFSC), Special Envoy to the SSC
Mike Sigler (AFSC), Vice-chair
Jane DiCosimo (NPFMC), Coordinator
Dave Carlile (ADF&G)
Mary Furuness (AKRO)
Dana Hanselman (AFSC)
Alan Haynie (AFSC)
Brenda Norcross (UAF)
Leslie Slater (USFWS)
Kerim Aydin (AFSC)
Brenda Norcross (IPHC)
Lowell Fritz (NMML)
David Barnard (ADF&G)
Yuk W. (Henry) Cheng (WDFW)

The BSAI Groundfish Plan Team convened on Monday, November 17, 2008, at 2:00 pm. The Team welcomed new members Dana Hanselman and Alan Haynie. Thirty five members of the public and ten agency staff attended parts of the meeting. The Team adjourned by 4 pm on Friday, November 21, 2008. Mike Sigler acted as chair, as Loh-lee Low attended the meeting only during the EBS pollock and Pacific cod reviews because his participation was required at two other management-related meetings.

EBS pollock Jim Ianelli presented results of the 2008 assessment. He comprehensively reviewed all new data going into the model, the assessment history and current stock status, and projections of productivity estimates. Both the bottom-trawl and acoustic surveys were conducted in 2008, as they have been for each of the last three years (acoustic surveys are normally conducted every other year). Survey estimates of pollock biomass were down from last year and bottom temperatures were far colder than average for the third consecutive year. Jim reported that the fishery catch during the B-season was more concentrated in the northwest region of the eastern Bering Sea (west of 170°W), similar to last year. In general, this can result in a trend where younger pollock represent a larger fraction of the catch. These shifts are reflected in the model as changes in selectivity, so that appropriate levels of spawning biomass are conserved in subsequent yield calculations. Relative to the 2008 ABC of 1.0 million t, the lower 2009 ABC value (of 815,000 t) is due to a combination of biomass differences and revisions in the estimates of age composition based on new data available for the current assessment.

To determine the influence of new data, Jim ran separate models, sequentially adding in the new observations from each data set. This process (referred to as "CABE" in the assessment) illustrated the sensitivity of new data to the yield estimates, particularly since the stock is below the target B_{MSY} level. In 2009 and 2010 both the acoustic and bottom-trawl surveys will be conducted as part of the NPRB BSIERP program. This will be very timely, and will allow abundance trends and fishery impacts to be monitored closely.

The Team concurred with the author that age 3+ biomass of EBS walleye pollock has declined steadily since 2003 due to poor recruitment in five consecutive years. The team agrees with the author that the 2006 year class is reliably estimated to be above average. In last year's assessment, the 2006 year class was estimated to be large, and this year it is estimated to be about double the average value, with less uncertainty than estimated last year. The team noted that the stock could be considered in a healthy state since an above average year class is a clear sign of continued reproductive capability. That the 2008 spawning biomass is apparently at its lowest level in twenty years is a concern. However, based on reliable data, spawning biomass is projected to increase in 2009 as the 2006 year class matures. The author commented that the relative contribution of the 2006 year class to the projected overall abundance for 2009 is not uncommon and that this stock has experienced a number of periods where the age structure was even less diverse.

Both the bottom trawl survey and the hydroacoustic survey tend to catch age 1 pollock if the year class is relatively strong. Once they are age 2, however, pollock become less available to the bottom trawl survey

but continue to be picked up in the hydroacoustic survey. After 2 years of age, pollock tend to become increasingly demersal. As a result, older pollock become less available to the hydroacoustic survey gear with age and more available to the bottom trawl survey. Vertical distributions of pollock by age and relative to temperature conditions were described as being potentially important factors in considering the availability of pollock to different survey approaches.

Henry Cheng recommended the "CA" run of the model because it is more conservative, because the "CABE" run of the model dilutes the impact of the catch and age data (by considering additional data), and because much of the area is unfished; he suggested that perhaps an unexploited population component exists somewhere. However, spatial exploitation of pollock is widespread and the unexploited fraction of the stock's geographic distribution is small. Ignoring the current year's survey estimates for this assessment would set a precedent which, if adopted, would raise the question of whether a similar policy should be applied to all other assessments. Most Team members preferred to keep all the data in the model. The Team adopted the author's recommendation for the CABE version of the model.

The Team supports the author's recommendation to set 2009 ABC at the maximum permissible level of 815,000 t. The Team considered recommending a lower value based on tier 3, but concluded that the maximum permissible level is sufficiently conservative for the following reasons:

- A 2009 ABC of 815,000 t will keep the spawning exploitation rate within the range experienced during the 1979-2005 period, and below the comparatively high values experienced in 2006-2008.
- The Tier 1 harvest control rules already have a built-in precautionary adjustment for stocks that fall below B_{MSY}.
- Uncertainty is already factored into the Tier 1 harvest control rules.
- A 2009 ABC of 815,000 t constitutes a large (18%) reduction from the 2008 ABC of 1 million t and would result in greater short-term catch stability than a lower ABC.
- The strength of the 2006 year class, estimated for the first time in last year's assessment, has been confirmed after a second year of survey observations, and the confidence interval has tightened considerably in the present assessment. A strong 2006 year class following weak 2001-2005 year classes would also be consistent with the hypothesis that the 2006 year class was affected positively by both decreased temperature and increased copepod abundance.
- Under a 2009 ABC of 815,000 t, the stock is expected to return to near B_{MSY} by 2010 if the stock is fished at the maximum permissible level.

The team noted ecosystem considerations related to prey availability and subsequent survival of pollock (and other apex predators) which the Council could consider in its decision for setting TAC. Loh-lee Low observed that we have seen higher exploitation rates in earlier years and the stock did not crash. The stock rebuilt successfully in the past when catch was 1 million t. The 18% reduction in ABC between 2008 and 2009 is in line with model results and overall data trends.

Lowell Fritz observed that higher than average fur seal pup weights were associated with high abundance of age 1-5 pollock (for adult female fur seals); pollock are not "junk food." He supported an ABC set under tier 3 (458,000 t). He supported fishing at an ABC set under tier 3 (458,000 t). He supported fishing at $F_{40\%}$ for two reasons related to the history of pollock recruitment: 1) there is not a strong relationship between the biomass of spawners and the abundance of age 1 recruits; it is the strength of this relationship that provides confidence that F_{MSY} is the appropriate harvest strategy; and 2) the distribution of strong year classes is more evenly distributed around $B_{40\%}$ than B_{MSY}. Significantly, the only big year class associated with a spawning biomass that was less than B_{MSY} was the 1978 year class (30 years ago), while both the strong 1978 and 1992 year classes were associated with spawning biomasses less than $B_{40\%}$.

Kerim Aydin expressed similar concerns as those expressed by Lowell, although he noted that a few signs were more encouraging than in the past two years, namely: 1) the tier 1 recommended exploitation rate would in fact be lower than it has been for the last two years and 2) while the climate since 2001 remains

highly uncertain, several signs, including pollock surveys as well as climate and plankton conditions, seem to indicate that the 2006 year class is in fact above average, so that even if the stock has entered a period of low productivity, the 2006 year class may provide a temporary buffer against uncertainty. He noted that concern may be greater in the southeast and around Pribilof Islands, due to the northward shift of the population in conjunction with concern for island-based seabirds and marine mammals that rely on pollock for prey.

The Team emphasized that next year's recommendation for the 2010 ABC is dependent on continued confirmation of the strength of the 2006 year class and subsequent year class strengths. If the 2006 year class is only average, then the current projection for the 2010 ABC under tier 1b would drop to 960,000 t.

One member of the public recommended a lower ABC than the Plan Team recommendation.

Bogoslof pollock Jim Ianelli reported that the standard assessment approach for this species was applied again this year. A biennial cycle for the survey and assessment began this year. The *Oscar Dyson* tentatively is scheduled for a survey in March 2009. Acoustic survey biomass is about 250,000 t during recent surveys. The 2007 EIT survey results have been published in a NOAA technical memorandum. The Team accepted the author's recommendation for OFL and ABC under Tier 5 and noted that the ABC value follows the SSC's alternative which is less than the maximum permissible.

Aleutian Islands Steve Barbeaux presented a new model configuration for AI pollock, based on several recommendations from the 2008 CIE review (also conducted for Atka mackerel). Eight changes to the model were noted. The reference model addressed the entire NRA (Near, Rat, and Andreanof Islands) region, compared with past reference models that covered just the Eastern NRA west of 174° W. Besides annual catch amounts, no new data have been incorporated into the model since 2006. The directed fishery started in the 1980's in the north and east, but sequentially moved west in the 1990s. The authors reported 400 t of harvest in the directed fishery and 1,100 t of incidental catch. Large catches occurred in the 1980s and 1990's. The directed fishery closed in 1999 and then reopened in 2005. Catches since the fishery reopened have been small. The AI BT Survey biomass estimates have decreased in the last two surveys but are highly uncertain. The 2008 Aleutian Islands Cooperative Acoustic Survey Study (AICASS) saw pollock concentrations in the same locations as in 2006 and 2007; pollock were slightly larger than the previous two years.

In the stock assessment the authors present six different model configurations. Of these six the authors ultimately selected the configuration with the worst likelihood fit. The authors selected this model as the reference model based on the best biological explanation for selectivity, with a model that has selectivity asymptote at 8 years of age, which is the age that corresponds to the pollock length at 90% of $L_{infinity}$. All models fit poorly to the BT survey biomass estimates. There are large differences in total and spawning biomass between the entire NRA and western NRA region. A decline in mid-1990s for all AI stocks stabilized after 1999. Year class strength has been below average since 1983. A very large 1978 year class can be seen in the population and fishery through the early to mid-1990s. The regulatory cap of 19,000 t appears conservative.

The use of all NRA catch data in the reference model greatly inflated the estimated biomass in the 1980's, thus inflating the reference points such that the decline in the stock in the 1990's was much greater than estimated in previous years assessments. The Gulf of Alaska maturity schedule used in this year's assessment resulted in a lower proportion mature at age for younger fish, therefore reducing the estimated female spawning biomass in proportion to the total in comparison to last year's assessment. Changes to the fishery selectivity-at-age vector used in the projection model impacted the older aged fish (10+) relative to last year's assessment resulting in changes in $F_{40\%}$ and $F_{35\%}$.

Dave Benson asked why there is a bigger buffer between ABC and OFL in 2009 than in 2010. In response, the authors noted (later) that this was a transcription error for 2010 and this was revised in the current draft.

The CIE report, which led to the new model configuration, was presented at the September 2008. meetings and the modifications were anticipated. Therefore, the Team accepted the model as presented even though the changes were substantial. The Team also agreed with the author's choice of model configuration which used constant selectivity and specification of selectivity for ages 8 and older to be the same. The new model applied Tier 3b whereas Tier 3a was applied last year.

The Team recommends exploring productivity changes in the stock and future recruitment uncertainty by computing five year population projections with 1) standard 78+ and 2) 1990+ year classes. The CIE recommended using entire time series since there is no reason to assume 1978 was an anomaly. The Team adopted the revised author's recommendations for OFL/ABC. Council policy is to set TAC at a maximum of 19,000 t (or lower if the ABC is lower). The Team recommended that the ABC be set at the tier 5 level of 15,300 t. The 2010 OFL and ABC were derived assuming a 2009 catch of 2,000 t. The Team recommends that a survey in the Aleutian Islands continue to be conducted; the assessment model requires contemporary survey results to update the model, and a lack of new data results in a less precautionary ABC.

Pacific cod The presentation of the EBS and GOA cod assessments by Grant Thompson is summarized in the joint Team minutes. The Team agrees with the author's approach for choosing selection functions that are asymptotic ("asymptotic algorithm") and for incorporating age data into his preferred model (Model B1), which estimated an age/length (growth) relationship internally. The Team accepted the author's recommendation for maintaining ABC at 176,000 t for 2009 and 2010. Some of the discussion leading to these decisions is captured in the following summary.

Following a suggestion from the 2007 technical workshop, both last year's and this year's assessments have forced the selection function for at least one fishery to reach an asymptote (i.e., fishery selection increases with age to a maximum, and once at the maximum, stays at the maximum) in order to stabilize the model. Mark Maunder suggested that the model may have set too many fishery selection functions as asymptotic. He noted that fisheries with large sample sizes may have more influence on model stability than fisheries with large catches. Grant agreed, although he also clarified that this is not an issue in the case of Pacific cod, because the same fisheries are identified as "major" regardless of whether the ranking is done in terms of sample size or catch. Mark suggested three additional paths to pursue in specifying which fisheries or surveys should be allowed to exhibit dome-shaped selectivity: 1) run the survey length frequencies through the same procedure as was done for the fishery; 2) instead of making a single, time-invariant determination for each of the nine fisheries, repeat the entire analysis for all nine fisheries separately for each 5-year time block (although this would further complicate an already complicated model); and 3) examine the tag data, which provide information about the availability of older fish. Mark reiterated his past recommendation that the age data not be included in the model until the discrepancy between mean length-at-age implied by the length and age data is worked out.

Jack Tagart believes the survey, rather than one of the fisheries, should have an asymptotic selection function. He suggested that the fishery that catches the largest fish may still not really exhibit asymptotic selectivity; it is theoretically possible for all fisheries to exhibit dome-shaped selectivity, with some selectivity curves simply being more strongly domed than others. Jack asked Grant whether he would continue to force at least one fishery in the model to exhibit asymptotic selectivity even if he knew for a fact that all fisheries in reality exhibited dome-shaped selectivity. Grant responded that he probably would not; however, given that this hypothetical question presupposes a state of knowledge that does not exist, and given that it has thus far proven extremely difficult to stabilize the model without forcing at least one fishery to exhibit asymptotic selectivity, it is appropriate to retain the assumption of asymptotic selectivity for at least one fishery.

The Team encouraged the AFSC to document the accuracy of the age data. Dan Kimura noted that the BSAI age data fit the length frequency modes better than occurs in the case of the GOA age data. The

Team noted that, for a decade, it had asked for the age data to be incorporated into the assessment model, so the Team does not want to exclude the age data unless there are compelling reasons to do so.

Most Team members felt that the externally estimated value of natural mortality, M = 0.34, is a reasonable choice. The convention in North Pacific assessments is to fix M. The Team noted that models B1 and C1 were equally compelling; with the only difference between them is the values of M, 0.34 and 0.33, respectively.

Mike Sigler summarized two points for accepting the author's M: 1) the convention is to fix M because dead fish cannot be observed, and natural mortality, catchability and the degree of dome–shape in the selection function are confounded; and 2) new age data motivated the change in the assumed value of M from 0.37 to 0.34.

Mike also summarized the ABC choices for the Plan Team to consider: 1) maximum permissible; 2) constant catch; and 3) downward adjustment from last year's ABC, assuming that the model has the scale right and biomass is trending downwards. Henry Cheng recommended setting a lower ABC for more conservation based on: 1) the trawl survey biomass estimate is at an all time low; and 2) the strength of the 2006 year class can only be gauged from 2007 and 2008, and the estimated size of the year class declined in 2008. The Team debated whether there is reason for more pessimism now than last year. The Team noted that under the ABC control rule, the current model already incorporates the revised year class strength, the decrease in survey biomass, and the F rate adjustment under Tier 3b management. The Team considered whether to adopt the maximum ABC and recommend that the Council consider a TAC reduction, but concluded that uncertainty in the model warrants an ABC adjustment, rather than solely a TAC consideration. The maximum ABC is only 3.4% higher than author's recommendation. Kerim Aydin summarized two uncertainties to be considered: 1) model uncertainty - there are a few reasonable models (B1 and C1 have similar weights) and 2) process uncertainty - what is the model not tracking in the ecosystem - a) extremely cold back-to-back years; b) unusual environmental conditions, but certainly not increasing biomass.

Mary Furuness reported that the B season weekly catch rates were quite a bit lower in 2008 by a couple thousand tons a week. In response, Kenny Downs reported that 2006 and 2007 were exceptionally high catch years, and 2008 was a normal B season.

Pacific cod split The Team briefly discussed the SSC decision in October 2008 to set a combined BSAI OFL and separate BS and AI ABCs for Pacific cod. The SSC did not identify in which fishing year it would recommend the area split be implemented. Jane DiCosimo summarized the management implications on current regulations that regulate the cod fishing sectors and affects on endangered species (SSL) if the ABC split occurred prior to Council action to revise the allocations, which is scheduled for Council discussion in December 2008. A new analysis to amend current regulations would be prepared in 2009. The Team noted that there was no conservation emergency for the Council to split management of BSAI Pacific cod into separate ABCs for EBS and AI in December 2008.

Sablefish The joint Team discussion on sablefish can be found in the joint Team minutes. The BSAI Team adopted the author's recommendations for the model, tier level, and OFL and ABC recommendations for the EBS and AI.

Greenland turbot Jim Ianelli summarized the assessment and results of the 2008 slope trawl survey. He applied a simplified Tier 5 approach in this year's model to contrast with a Tier 3 computation from the age-structured model (which uses an earlier version of Stock Synthesis 2). The Team recommended the age-structured model as with past years.

The stock appears to be still decreasing, consistent with the general decline since the mid 1970s. The biomass estimate for the 2008 slope survey was lower compared to 2002 and 2004 (particularly at 400-600 m depth). The EBS shelf bottom trawl survey generally has smaller fish and after ten years of poor

recruitment signs, there appears to be young fish entering the population. Fishing mortality has remained very low but has recently shifted to larger fish.

There are marked differences between survey and model biomass estimates; more fish are estimated in the model (a sum of recent average surveys give a total biomass that is about 67% of the total model biomass). This could be due to the absence of large females in the survey gear. *The Team encouraged the authors to further investigate sources for these differences*. The model implies that some fish are not being caught in the survey, or that fishing mortality or natural mortality is much higher on females. A larger fish can avoid trawl gear easier, but may be fully selected by longline gear. Similar selectivity pattern as in the slope survey supports the supposition that there are fewer large females because this occurs irrespective of gear type.

Catches are low (<3,000 t). The fleet targets pre-spawning aggregations; the fishery opens May 1 and usually occurs June-Aug in the EBS to avoid killer whale predation; *this predation should be mentioned in the assessment*. The trawl fishery was bycatch only until 2008, with about half the TAC taken by this fishery. Amendment 80 now allows a trawl fishery to be conducted; effort had dropped due to poor flesh quality. The trawl fleet takes more males (except in 2007 when the sex ration was 50/50).

The Team concurred with the author's recommendation to increase the ABC over last year's ABC, but did requested a modification from the author's proposed ABC. Last year, the Team recommended not increasing the ABC because the slope survey in 2006 was canceled; the Team used a five year average fishing mortality range and set ABC at 21% of maximum permissible ABC, due to stock structure and model uncertainty. This year the Team followed SSC advice to consider increasing ABC upon reviewing new slope survey results. The Team also balanced favorable recruitments from the 2008 slope survey with the differences noted in biomass estimates and uncertainties in stock trends.

The Team recommended a stair-step increase in ABC towards the maximum permissible value. The step for 2009 would yield an ABC that is 60% of the maximum permissible ABC, which is approximately half-way between the 2008 ABC recommendation of 21% of maximum permissible and 100% of maximum permissible. The author provided these calculations and concurred with the Team's recommendation.

The Team also recommended continuing the stair-step increase in ABC up to the maximum permissible ABC in 2010, *only if* there is a 2010 survey. If no survey occurs in 2010 the Team recommends maintaining the 2009 ABC for 2010. A 2010 survey would allow verification of increased recruitment and biomass since the slope encompasses the main habitat for the species and is a good index of the population.

The Team noted that the author's 2010 OFL/ABC recommendations are lower than for 2009 despite an expected increase in recruitment. *The Team recommended that the author explore 1) the scale of biomass estimated by the model and 2) the proposed ABC effect of recent recruitment indicated by the 2009 fishery.*

Arrowtooth flounder Tom Wilderbuer presented the assessment for the assemblage of arrowtooth flounder and Kamchatka flounder; the former is the indicator species. The assessment includes the 10 Aleutian Islands surveys and the survey size composition for the species. Including AI data added after 2006 resulted in different estimates of spatial distribution; only 72 % of the stock is estimated from the Bering Sea shelf, 18% from the Aleutian Islands, and 10% from the Bering Sea slope. Good year classes occurred during 1995-2003. The BT survey biomass was up 7%. About 43% of the 2007 catch was retained (the trend is generally upward, but variable). The model includes a larger estimate of survey catchability this year, due to a new functional form describing the relationship between catchability and temperature. A reformulation of catchability now allows an estimate of the constant or time-independent estimate of survey catchability, and has the effect of reducing the estimates of female spawning biomass

and total biomass from the 2007 assessment. The Team concurred with the authors that there is insufficient data for this stock to elevate the assessment to Tier 1 status.

The Team accepted the model and author's recommendations for OFL and ABC. The Team supported completion of the spatial and temporal analysis of arrowtooth and pollock distributions being undertaken by Stephani Zador and Kerim Aydin.

Northern Rock sole Tom Wilderbuer summarized the results of the assessment. Rock sole has been managed under Tier 1 beginning in 2007. He reviewed additional data to the model. He added a split-sex component to the model in this assessment. The Team supports the author's recommendation using Model A, and the corresponding OFL and ABC recommendations for 2009 and 2010. The Team recommended that the author continue to pursue further analysis as to why arithmetic and harmonic means of F_{MSY} (and thus estimates of OFL and ABC) are within 4,000 mt. The constant selectivity assumption may cause this narrowness and the assessment authors plan to explore time-varying selectivity in next year's assessment. This is not a management concern because the catch does not approach the ABC.

Flathead sole Buck Stockhausen summarized the results of the assessment. The assessment includes 0.1 percent of the assemblage catch as Bering flounder. The Team discussed its recommendation from November 2007 that Bering flounder be moved from the flathead sole assessment into the other flatfish assessment. The flatfish authors responded that Bering flounder was poorly distinguished from flathead sole, particularly in the longline fishery. Industry members concurred that the two species were not separately identified. In response, the Team agreed to continue to keep Bering flounder in this chapter and to request the author to identify that this chapter addresses the flathead sole complex, with flathead sole as the indicator species and Bering flounder included in the complex.

The author reviewed model runs that allowed for a one-year time lag in the relationship between bottom trawl catchability and bottom temperature and recommended an additional year of investigation of temperature-dependent q before accepting the new relationship between temperature and abundance for setting specifications. He also tested three recruitment models. The author recommends staying with Tier 3 and continuing to regard recruitment as independent of stock size until the issue of different production regimes can be resolved. Low spawning biomasses and high recruitment occur in the early part of the time series, while high biomasses and low recruitment occur in the latter part. He mentioned plans for conducting management strategy evaluations in 2009.

The Team concurs with the author's model recommendation. The Team agreed with continuing to test the one- year time lag assumption. The author also suggested that the current approach to estimating a stock/recruit relationship within the assessment model may not be optimal. Next year, he plans to compare approaches that estimate the stock/recruit relationship inside the assessment model (as part of the overall minimization of the model's objective function) and outside the assessment model as a post-processing procedure after the assessment model has been run (i.e., as completely independent of the minimization of the assessment model's objective function).

Henry Cheng noted that using both AIC or corrected AIC (AICc) to select the best sub-model will tend to over-parameterize the selected sub-model. In addition, the likelihood used must be a normalized likelihood when we use AIC or AICc. But the normalized constant of the likelihood is unknown in the model. The Team suggested that the authors conduct student t-tests at all the estimated parameters of the selected sub-model. If all the estimated parameters are significant ($P<0.05$), then it is the best sub-model. Otherwise, the authors should consider dropping the non-significant term(s).

Yellowfin sole Tom Wilderbuer summarized the results of the assessment. Yellowfin sole (YFS) has been managed under Tier 1 starting with the 2007 fishing year. He reviewed additional data incorporated into the model. The author recommends the base model. Allowing M to be estimated as a free parameter for males with females fixed at 0.12 provides a better fit to the sex ratio estimated from the annual trawl

survey age compositions than does the base model. Since the population sex ratio annually observed at the time of the survey is a function of the timing of the annual spawning in adjacent inshore areas, providing the best fit to these observations may not fit the population sex ratio better. The author does not support Alternative 2 model because the trawl survey does not measure sex ratio accurately for YFS. He noted that the survey does measure sex ratio accurately for rock sole. He noted that rock sole do not have the same spawning behavior as YFS. The timing of spawning also confounds the results. Spawning distribution of YFS is nearshore, which is not sampled by the survey.

Dana Hanselman noted that the log-likelihood increased when the yellowfin sole model changed to a split-sex version, which is surprising given that the number of parameters increased. It may be that splitting the age and length data, previously categorized as unsexed, into male and female components, increased the amount of log-likelihood associated with the age and length data. The Plan Team requests that the assessment authors check for this effect and if operating, consider whether the log-likelihood weighting for the age and length data should be decreased as a consequence.

Henry Cheng noted that the ratio of the estimated values of M, estimated outside the assessment model, and k are outside the range of usual ratios. The usual range of ratios are in the vicinity of M = 1.5K based on Jensen (1996). For indirect methods of estimating natural mortality, Jensen (1996) developed the relationship for estimating natural mortality from growth relationships of M=1.5K. The Plan Team requests that the assessment authors consider whether this range is biologically reasonable and if not, explore the effect of restricting the model to a reasonable M:K ratio. K was estimated from the von Bertallanfy fit to age at length data; this analysis was completed several years ago. The author will update the estimate of K with all age data in response to Dr. Cheng's concern.

Alaska plaice Tom Wilderbuer updated the model similar to one for Arrowtooth flounder. He tested for a temperature effect on bottom trawl biomass estimates and found that, ocean temperature seems unrelated to catchability of Alaska plaice. There were very strong year classes in 2000 and 2001. Tom noted that the stock was increasing, but that estimated biomass decreased in this year's model compared to last year's model because the high numbers of small fish observed last year was not observed in this year's BT survey. The species has an exploitation rate of less than 1%. More than 80% are discarded, but the discard trend is downward (which is consistent for all Amendment 80 species). He noted that the recommended F is high because the species are selected by the fishery at a much later age than when maturation occurs. The Team accepted the model and author's recommendations for OFL and ABC. A split sex model is planned in the future.

Other flatfish The Team accepted the model and the author's recommendations for OFL and ABC using Tier 5. The Team noted that the butter sole catch was estimated to be higher than the biomass estimate in some years, although it noted that the species was at the periphery of its range. The author reviewed big changes in the contributions of different species to total other flatfish biomass since the early 1980s. For next year, the Team recommended that the author provide plots of spatial distribution of biomass with fishery catches for butter sole.

Squid Olav Ormseth summarized the squid chapter. The Team recommended its past approach for setting OFL and ABC. Olav presented fishery length composition data and maps of squid catch distributions. He suggested that a request be made to the observer program to identify squid to species in catches. The Team requested that any changes to the assessment, including new data sources, be scheduled for presentation and discussion at the September meeting. Olav reminded the Team that the Council has initiated a FMP amendment to possibly move squid into the forage fish category. Jane DiCosimo responded that the analysis might be 2-3 years in the future.

Skates Olav Ormseth presented the skate assessment. Area 521 (outer shelf) has the highest skate catches, and the total skate biomass estimate from the trawl surveys has been declining since the mid-2000's. Pacific cod longline and flatfish trawl fisheries have the largest incidental catches. Skate catch has increased in the pollock fishery, as the fleet targets older populations of pollock which are found closer to

the bottom. The author responded to SSC comments with the following improvements to the model: 1) the steepness of the Beverton-Holt stock-recruit relationship was fixed at 1.0; 2) the standard deviation of log recruitment was fixed at 0.4; 3) selectivity at age was modeled as a logistic function; 4) independent estimates of survey selectivity were incorporated; and 5) survey catchability was fixed at 1.0 and a logistic function for survey length selectivity was fixed so that the selectivity matched the results of an independent analysis of skate capture probability. The author also discussed possible explanations for the model underestimating length at age for older skates. The Team accepted the model and the authors' recommendation for tier 3 management for Alaska skates and tier 5 management for "other skates." For next year, the author will again explore the use of Stock Synthesis 3, if the new version successfully adds other growth functions appropriate for skates. He also will explore placing priors on catchability.

Sharks. Jon Heifetz briefed the Team on the shark chapter. Most unidentified sharks are likely to be unidentified spiny dogfish, salmon sharks, and sleeper sharks, as they are most frequently caught. Mike Sigler suggested that the authors add P values to the lines fitted to the abundance trends. Jon noted that surprisingly few sleeper sharks were observed in the slope survey. Sharks are not sampled well by the BT surveys, therefore the biomass estimates have not been used to apply Tier 5 to sharks (Sleeper sharks are better sampled by bottom trawls.) Jon reported that future research plans include collecting more biological data for modeling these stocks. He noted that Auk Bay Lab is leading efforts on spiny dogfish, ADF&G is leading efforts on salmon sharks, and Dean Courtney (PIFSC) is completing his dissertation on Pacific sleeper sharks.

The Team accepted the authors' recommendations for Tier 6 and the basis years (1997-2007) for the calculations of OFL and ABC. The Team noted that the Council recommended separating sharks from the other species complex in a future FMP amendment for the GOA and BSAI but that Council action was 2 - 3 years in the future.

Sculpins Rebecca Reuter summarized major changes to the assessment strategy. New information, from recent research, resulted in more conservative M estimates (which ranged from 0.04-0.63), which is lower than last year's most conservative M estimates (0.19). Todd TenBrink suggested that the average M might be a little higher than the true estimate. Mike Sigler suggested that the authors include more information and a discussion on the different methods for calculating M, provided in the assessment, which could help in determining the best M to use in the calculation of ABC/OFL. The Team considered whether we still need the most conservative M when more information has been added about these species. A reasonable M for these long-lived species (age 28) is < 0.2. Mike suggested that the new values of M are analogous to a model change and requires more deliberation and recommended that the Team schedule a more thorough review in September 2009. If adopted then, the author can apply the agreed-upon values of M to calculate ABC/OFL for the review of the assessment in November 2009.

Octopus Liz Conners summarized the octopus chapter, emphasizing 2008 data. She reported better species identification was occurring by observers. The shelf survey octopus biomass was 87% *E. dofleini*. The Team concurred with last year's approach for setting OFL/ABC using a Tier 6 average. The Team also recommended that the author consider a static time interval for the catch history used to set OFL and ABC (e.g., 1990-2006), rather than updating those values every year based on a sliding 10-year window (e.g., 1998-2007). The chapter contains additional suggestions for regulating octopus harvests including a maximum size and discard mortality rates. In their September minutes, the joint Teams endorsed the use of gear-specific discard mortality rates (DMRs) in catch accounting for octopus. The Teams encouraged further development of studies and/or data collection to document octopus mortality rates. These could be included in the proposed analysis in 2009 for moving octopus either into its own specification category or into the forage fish category..

Grenadiers Jon Heifetz summarized the combined GOA, EBS, and AI grenadier assessment. New information on giant grenadiers was incorporated into the model. Grenadier catch is about on the order of sablefish catches. Highest catches occur in the GOA. Giant grenadier (97% of the grenadier catch)

dominates GOA sablefish bycatch and EBS turbot longline and pot fisheries. Despite there being no deep water surveys in the AI, the highest biomass estimates were derived for this area. The BT surveys likely do not cover the full depth distribution of giant and Pacific grenadiers. The author used the relative biomass estimates (RPW) from the longline surveys of EBS and GOA and compared them to the slope bottom trawl survey estimates for EBS and GOA. For this version, he used the ratios between EBS and AI, and GOA and AI to estimate AI grenadier biomass. The maximum age of Pacific grenadier is 58. In 2006, the authors presented Tier 5 recommendations. The authors could apply Tier 4 because age-at-maturity are available for giant grenadier. The Team recommended that the assessment be prepared every two years until the analysis in support of a proposed FMP to move grenadiers into the Groundfish FMPs as a target species was considered by the Council. That amendment is a few years away from Council consideration. In September the joint Teams recommended that the Council give this proposed FMP amendment a higher priority for action. The Team had a brief discussion of the pros and cons of moving grenadier into a target category. No conservation issues for grenadiers were identified.

Atka mackerel Sandra Lowe summarized proposed changes to the model which resulted from the CIE review in 2008. An above average 2004 year class has been verified in the 2006 survey and is incorporated into the model. The Team accepted the author's recommendations for the model and OFL/ABC recommendations. The last AI BT survey occurred in 2006; the 2008 survey was canceled due to budget constraints; the next AI survey is scheduled for 2010. This is a concern for the assessment due to life history of the species. The Team is concerned that insufficient information is available to ascertain whether there is enough Atka mackerel to sustain SSL in the AI. The Team is concerned that the lack of the 2008 survey could result in an overestimate of biomass in the assessment. Fishermen eventually may the above average 2004 year class, lacking a recent fishery-independent survey, the model then would overestimate abundance and ABC values.

There were differences in how the fishery was prosecuted in 2008 under Amendment 80. While the first year of fishing under Amendment 80 has spatially dispersed the fleet, Steller Sea Lion and habitat conservation area regulations lock the fleet into the same fishing spots. For September 2009, the Team suggested that the author explore apportioning the ABC for subareas by numbers of fish (using past data) as an alternative to current weight apportionments. The Team may recommend such an apportionment in the 2009 assessment depending on those results. The Team also asked if running the model with average recruitment in the 2004 year class could be investigated. The Team requests that the author present this information at the September 2009 meeting.

Blackspotted/Rougheye Rockfishes Paul Spencer presented the assessment. Along with developing separate assessments for shortraker rockfish and rougheye rockfish this year, fish previously referred to as "rougheye rockfish" are now recognized as consisting of two species, the rougheye rockfish (*Sebastes aleutianus*) and blackspotted rockfish (*S. melanostictus*). A paper was published by Orr and Hawkins in 2007, and the authors and plan Team applied this new classification in their recommendations. Blackspotted rockfish is the predominant species in the Bering Sea and Aleutian Islands.

The Team accepted the author's recommendation for a new age-structured model for this complex, and noted that the increase in biomass is a result of using the new model. The Team also briefly discussed the availability of genetic, growth, and demographic information pertinent to whether the blackspotted and rougheye complex in the BS should be considered a distinct complex from that in the AI. The complex primarily consists of blackspotted rockfish in the AI. The Team disagreed with the authors' recommendation and does not recommend splitting rougheye complex management between the BS and AI at this time. The Team requested that a general discussion of stock structure and management implications for area management, including disproportionate harvest to area ABC be scheduled for joint Team discussion for September 2009; genetic experts will be invited. The Team accepted the author's recommendation for OFL and ABC: Tier 3b for AI, Tier 5 for EBS.

Paul Spencer also presented independent estimates of natural mortality for blackspotted/rougheye rockfish, Pacific Ocean perch, shortraker rockfish, and northern rockfish based upon: 1) Hoenig's (1983) relationship with maximum age, and 2) the quantile method, in which the mortality rate consistent with a specified quantile of the population that survives to an old age is identified. Bill Clark and Grant Thompson both commented that the quantile method is preferable when large numbers of fish have been aged in order to avoid basing the estimate on an unusually old fish not representative of the population. Spencer presented natural mortality estimates using both methods with a range of values for maximum age, including the maximum age and the ages associated with the 99th and 95th percentiles. The two methods gave very similar results. For all rockfish species, the currently used natural mortality estimates are either consistent with, or slightly more conservative than those obtained from the independent estimates.

Shortraker rockfish Paul Spencer indicated that the removal of the blackspotted/rougheye complex from the previous shortraker/rougheye complex results in a single-species surplus production model for shortraker rockfish, which is a unique modeling application in Alaska. Previously, the shortraker/rougheye rockfish complex was assessed with a two-species surplus production model that accounted for potential covariance in catch estimates. This year's assessment is a straightforward update of the 2006 model; there was no AI survey this year. The author reviewed concerns about disproportionate harvest by area; catch exceeded an ABC level for the BS in 2007 by about 100% if area apportionments were in effect. The oldest fish is 124 years. Aging efforts for this species are new, and there is insufficient age data with which to manage this species.

Pacific Ocean perch Paul Spencer presented the assessment and summarized his response to SSC comments. He asked the Team for input on approaches to modeling time-varying fishery selectivity. Mike Sigler and Dana Hanselman suggested examining modeling fishery-selectivity as constant within blocks of time that might correspond to significant changes (i.e., switch from foreign fishery to domestic fishery, changes in depth distribution, etc.). Grant Thompson suggested that it would be premature to impose a one size fits all solution to this issue and that the author should consider what is appropriate. The Team accepts the author's recommendations for the model and OFL/ABC.

Northern rockfish Paul Spencer presented the assessment and summarized his response to SSC comments. The catch is mostly bycatch in the Atka mackerel fishery. Estimation of a reasonable fishery selectivity curve remains difficult in this model, and tends to imply a very old age at 50% selection relative to the survey selectivity curve. Thus, the fishery selectivity curve was constrained to be close to the survey selectivity, and can be justified in that a different fishery selectivity would occur if a directed fishery were to develop. Discards dropped from 91% in 2002 to 79% in 2007, but are still high. The Team briefly discussed that the SAFE Report tables listing retention and discards may not conform to calculations made for the new groundfish retention standards program; a joint session in September 2009 will review the new GRS regulations and appropriate bycatch reporting in the assessments. The Team accepted the model, noting that the change in the natural mortality rate (M) caused the fishing mortality rate (F) to drop, which is the primary cause of the drop in the ABC.

Other rockfish Rebecca Reuter summarized this assessment. She identified that more effort is planned on aging of shortspine thornyhead rockfish. The Team recognized that an FMP amendment to remove dark rockfish is imminent and provided recommendations with and without that species. The Team accepted the author's recommendations to apply Tier 5.

Assessment guidance for years with canceled surveys. Paul Spencer noted that although there is guidance on whether a stock requires a "full assessment" or an "update" (re-running the projection model with updated catch data) in "off" years in which a survey is not scheduled, he is not aware of any such guidance regarding years in which a survey was scheduled to occurred but canceled, which occurred with the 2008 AI trawl survey. Although this situation essentially does not differ from an "off" year, Spencer chose to conduct full assessments in order to avoid to several consecutive years of "updates", and the Plan

Team agreed with this choice. However, under the current guidance, other authors appear to have the latitude to choose not to produce full assessments in this situation. To avoid inconsistencies in the level of information produced, Spencer asked the Plan Team to consider developing consistent guidance for years in which surveys are canceled.

Pacific halibut discard mortality rates Gregg Williams summarized the appendix to the SAFE Report, which reports on the IPHC recommendations for discard mortality rates (DMRs) to apply to the 2009 Community Development Quota (CDQ) Program. The CDQ rates are set annually due to the relative newness of the program. Next year, IPHC will provide recommendations for both the CDQ and non-CDQ fisheries for 2010-2012 fisheries, as at least ten years of data will then be available for both sectors. Henry Cheng suggested that IPHC consider using standard deviation instead of standard error. Gregg said he'd discuss it with Dr. Ray Webster, IPHC statistician. The current statistic for representing variability was recommended by the SSC. The Team accepted the IPHC staff recommendations. The Team also discussed the possible incentives for managing halibut bycatch with cooperative-specific DMRs.

Next meeting The Team identified its 2009 meeting schedule. The Team will meet separately and jointly with the GOA Groundfish Plan Team during September 14-16, 2009 and November 16-20, 2009. The Team identified two issues, along with others yet to be identified, for the BSAI Plan Team agenda in September 2009: 1) effects of BSAI Amendment 80 and Groundfish Retentions Standards on reporting bycatch/retention in the BSAI SAFE report; 2) weight based apportionments for Atka mackerel; and discuss preparation of team minutes. Items to be scheduled for a joint discussion with the GOA Plan Team are listed in the November 2008 joint Team minutes.