

Crab Plan Team Report

The Crab Plan Team met May 11-12 and May 15th, 2009 at the Alaska Fisheries Science Center in Seattle, WA.

All Crab Plan Team members were present:

Forrest Bowers (ADF&G-Dutch Harbor), Chair

Ginny Eckert (UAF/UAS), Vice-Chair

Diana Stram (NPFMC)

Doug Pengilly (ADF&G-Kodiak)

Gretchen Harrington (NOAA Fisheries –Juneau)

Wayne Donaldson(ADF&G-Kodiak)

Jack Turnock (NOAA Fisheries/AFSC-Seattle)

Shareef Siddeek (ADF&G-Juneau)

Herman Savikko (ADF&G-Juneau)

Lou Rugolo NOAA Fisheries /AFSC-Kodiak)

André Punt (Univ. Of Washington)

Bill Bechtol (UAF)

Bob Foy (NOAA Fisheries /AFSC-Kodiak)

Josh Greenberg (UAF)

Brian Garber-Yonts (NOAA Fisheries-AFSC Seattle)

Members of the public (and state and agency staff) present for all or part of the meeting included: Lori Swanson (Groundfish Forum), Doug Woodby (ADF&G), Arni Thompson(ACC), Jie Zheng (ADF&G), Linda Kozak, Jack Tagart (BSFRF), Jim Stone (Alaska Scallop Association), Brent Paine (UCB), Dick Powell (Patricia Lee), Doug Kinzey (UW), Phil Hanson (Unisea), Braxton Dew (NMFS/AFSC), George Hall, Martin Dorn (NMFS/AFSC), Kevin Kaldestad (Mariner Co-op), Lance Farr (Kevleenk), Anne Hollowed (AFSC/NMFS), Pat Livingston (AFSC/NMFS), John Gauvin, Jason Anderson, Tom Casey

Administrative:

The agenda (attached) was approved. Additional agendas are attached for the data weighting workshop as well as the revised Friday May 15th CPT agenda. The CPT minutes from the September 2008 meeting were approved.

Crab bycatch accounting in the groundfish fisheries:

Jennifer Mondragon (NMFS RO) provided the team an update on a catch accounting correction for crab bycatch in the groundfish fixed gear fisheries. The issue is observed samples that contained too many crab to be identified to species by the observer on board and were thus recorded as unidentified crab in the observer database. In these situations, the observers subsample the crab and identify the subsampled crabs to species. However, crab subsampled to species level were not being extrapolated in the database to unidentified crab, thus resulting in an underestimate of the fixed gear bycatch of crab. Because there are no fixed gear bycatch limits (the focus in CAS system has always been on extrapolation of trawl catch towards PSC limits), the oversight was only recently discovered. The database has been reprogrammed to extrapolate samples from 2008 forward. Although current sampling includes weight and/or number, random weight subsamples are still being used to apportion bycatch to species. The issue primarily relates to pot gear and has the greatest impact on the bycatch of bairdi and opilio. The team discussed the magnitude of bycatch in pot gear. There are no PSC limits currently for fixed gear.

Team members felt that a sensitivity analysis on the impacts of this additional mortality on assessments may be warranted. Groundfish pot bycatch is currently included as a small contribution to trawl bycatch. The team suggested that each assessment author break out individual bycatch estimates by gear type (pot gear, trawl, longline gear) for groundfish fisheries so that the contribution of each gear type on the total bycatch mortality estimated for the groundfish fisheries can be assessed and compared.

Jennifer noted that the programming solution only revises bycatch estimates from 2008 forward, and a similar correction is not yet available for pre-2008 bycatch. An additional problem exists because the current groundfish bycatch limits are in numbers but bycatch is currently modeled in weight in assessments. Thus, post-recruit and pre-recruit crabs are considered equivalent in terms of PSC limits. However, the observer data do have additional detail available on size of crab.

Jennifer noted that the next steps are to write up results of the bycatch extrapolation and proposed solution for distribution to the CPT by mid-June. She requested some guidance from assessment authors on when annual bycatch data should be made available for assessment purposes, noting that all data are not available until several months after the groundfish fisheries close at the end of December. Authors noted that making bycatch data available by late July would fit with the availability of survey data for incorporation into the final SAFE in September.

Jennifer also noted that the groundfish bycatch numbers provided to stock assessment authors did not consider any bycatch mortality rate multiplier to obtain the actual removal from the population.

The programmers are also working to estimate bycatch spatially. Prior to 2009, catch estimates cannot be split to areas smaller than federal reporting areas. However, it will be possible to split these data to ADFG state statistical areas for the 2009/10 crab year onwards. Bob Foy noted that extrapolation to unobserved fishing areas will still be problematic, particularly at small scale boundaries.

The team discussed the estimates of variance on the extrapolated unobserved catch and the need to account for uncertainty in catch and assessment estimates.

EBS bottom trawl survey reanalysis:

Bob Foy summarized issues with reanalysis of the time-series of crab trawl survey estimates. An overview of corrections to date is contained in the Introduction to the Crab SAFE report; a full report will be available for the final SAFE in September 2009. Database corrections resulted in either increased or decreased estimates of the number of crab by species for some years. There were some substantial changes to the time-series of the snow crab abundance estimates.

Unmeasured crab is a common problem for the early survey series, particularly for blue crab before 1981. There is no documentation of why some catches were weighed but not measured for length, one possibility is these catches were from non-standard survey tows. These records were previously distributed across the length distribution when computing abundance estimates, but are currently excluded. The CPT discussed how best to estimate the distribution of these crabs so as to use them when estimating abundance. Team members noted that they should be retained as previously distributed, it made clear that this had done. Assessment authors should be allowed to modify how these crab are handled in the assessment.

Bob requested CPT guidance on what information to include in the data revision (providing a graph of what is currently included when computing abundance estimates), and how to evaluate

the consequences of individual modifications. For example, there is an indication that the data for the early years are more affected by the unmeasured crab. The CPT noted that the effect of incremental changes in abundance estimates resulting from each adjustment needs to be well documented.

Survey information, as corrected to date, was provided to stock assessment authors and used in all May 2009 assessments except for Tanner and snow crab. Bob noted that analysts are still developing a consistent treatment of strata over years so that each year will not need to be modeled separately. Thus, the analysts are attempting to develop consistent strata assumptions and treatment by time period. Feedback on their approach would be useful.

The team discussed the ACL implications of variance calculation. Should we go beyond management districts to report biomass estimates and variance from the surveys? Should it be on a case-by-case basis with assessment authors or general policy?

There is a benefit of some consistency in efforts to break up strata by species. The CPT agreed that it would ideal if everyone used the same database. Therefore we need an established process and protocol for acquiring data. There could be a single data source (likely the Kodiak lab). Other needs (e.g., maturity information) could be provided to assessment authors, but each author needs to work with the Kodiak lab to ensure that abundance estimates are calculated in a manner which is consistent with how the standard estimates are computed.

Feedback was also sought from the CPT on which surveys to include when computing the time-series of abundance estimates, and how to incorporate special projects. Bob proposed three strategies for future analysis: (1) only include standard tows; (2) include all possible surveys; (3) include standard tows and some “appropriate” surveys. These analyses will be brought back for reevaluation by the CPT with each assessment author separately. In some instances, special projects might help to better understand a stock, although this could compromise the consistency of abundance estimates. The CPT recommended using only standard surveys by year as an index. Special projects and hot spots could then be analyzed to give better information about interannual variability.

The team discussed the advantages and disadvantages of moving to a time-series of abundance estimates when the reanalysis is not yet complete. The CPT noted that the final assessments in September 2009 should include the same historical data as presented in May 2009 (e.g., revised abundance time series except for snow and Tanner crab), but all assessments in May 2010 should use the revised abundance data.

CPT recommendation: The CPT recommended using only standard surveys by year as an index. Special projects and hot spots could then be analyzed to give better information about interannual variability. The team discussed the advantages and disadvantages of moving to a time-series of abundance estimates when the reanalysis is not yet complete. Not all assessment authors used the new dataset in the draft assessments presented to the meeting. The assessments that will be presented in September 2009 for each stock will use the dataset that was employed for the May 2009 assessment of that stock. Next year all assessments will use same new dataset for next May’s draft assessments.

Bob proposed vetting the survey re-analysis through the CPT next year, or possibly through a small workgroup comprised primarily of assessment authors. The team requested possible Council support for hosting a survey workshop. While recognizing the simpler logistics of using a smaller workgroup/public workshop, some assessment authors felt that the selection of survey

data would benefit from full CPT review. This workshop must probably occur in the fall (public meeting if possible to involve available CPT members), after which a larger group would meet for review purposes. The scope and timing of the meeting will be discussed further at the September CPT meeting.

OFL stock assessment review:

Norton Sound red king crab:

Jie Zheng summarized the revised NSRKC assessment. Because this fishery opens in June, the OFL for this stock is recommended by the CPT at the May meeting.

Jack Turnock noted that the CPT's preferred model from the previous year's assessment should be included in the suite of scenarios examined for the new assessment, in order to evaluate the impact of the changes in assessment methodology. This recommendation will be folded into the Crab stock assessment guidelines for the 2010 assessments.

Team members commented on the CVs and relative weighting, suggesting that results be evaluated to indicate whether weighting is appropriate. Jie should explore whether there is evidence for over-dispersion, for example, by evaluating how often the predictions are outside of the confidence intervals for the data.

The CPT discussed the justification for the zero handling mortality rate employed and questioned the justification as described in the assessment. The author assumed the only source of handling mortality is temperature-related freezing, but the team finds this assumption to be invalid. The team discussed additional mortality due to physical handling. The team recommends sensitivity tests be conducted next year based on plausible levels of handling mortality (use Bristol Bay red king crab as a benchmark). In the absence of any observer data on bycatch for this fishery, one suggestion was to estimate a fixed catch discard (e.g. 10-20% of retained) for comparison against the assumption of zero handling mortality.

The current assessment uses $M=0.30\text{yr}^{-1}$ versus 0.18yr^{-1} last year). The CPT discussed the validity of this change in M , noting that the likelihood profile for M in the assessment document does not fully justify this modification. If the assessment is using the argument that the likelihood profile is flat, then M should be based on Y axis scale, and not a visual evaluation of the profile. The CPT also disagreed with the assumption that the maximum age is 15 years, which is implicit in a natural mortality rate of 0.30yr^{-1} .

The team discussed the likelihood profiles of M presented in the assessment (Figure 2) and did not consider the rate of 0.30 to be adequately supported by either profile. The author argued that the likelihood profiles are essentially flat beyond $M=0.30$ and that constituted justification for the choice. The team observed that such a finding must be evaluated on the basis of the change in log likelihood units equivalent to a 95% confidence interval on the Y-axis. Inspection of the change in M within approximately 2 log likelihood units for either profile did not support the assertion that $M=0.30$. The team requested that the author provide a comprehensive rationale for the selecting M from the log likelihood profile and a more informative discussion of model sensitivity to varying values of M .

The author supported the choice of $M=0.30$ based on longevity. The author assumed that longevity (T_{\max}) for Norton Sound red king crab was 15 y. For the unexploited stock, a $T_{\max}=15$ y under a 1% rule corresponds to a $M=0.30$, viz 15 represents the 99th percentile of the age distribution of a virgin stock. $T_{\max}=25$ y previously used corresponds to a $M=0.18$ under a 1% rule.

The author's assumed $T_{\max}=15$ y was based on mark-recapture results on Norton Sound red king crab. Here, 15 y = the approximate mean age at tagging (7-8 y) plus the maximum years at large of a recovered tag (7 y). The team noted that the maximum recovery period (7 y) depended on the underlying mark-recapture program to provide crab at maximum age which was not evaluated. The team noted that the estimated 15 y age only represents a minimum estimate of T_{\max} by definition – e.g., observations are not on an unexploited stock and adequacy of the mark-recapture program to provide recoveries 17-18 y at large. The team was concerned that the strong pattern exhibited by results of the retrospective analysis indicates that model results may be upward biased.

The team discussed the estimated selectivity for small crab, noting that selectivity on small animals changed with M , but with flat selectivity for $M < \sim 0.29\text{yr}^{-1}$. It was also unexpected to see estimates of MMB and legal males increase with decreasing M below $\sim M=0.30\text{yr}^{-1}$. The team noted that additional information should be included in the assessment to better understand parameter estimation as currently specified in model. Also, the assessment should include the previous year's OFL and catch for determination of overfishing.

The current assessment uses a gamma value of 0.6. The CPT noted that insufficient justification was given for a gamma different from 1.0. It was further noted that the author chose to modify F_{msy} proxy to 0.18yr^{-1} (which is equivalent to the previous M value and a gamma of 1.0) without a clear justification. Author should provide strong justifications for rejecting the calculated F_{35} .

The CPT discussed the choice of model parameters, did not agree with the listed rationale for M and gamma, raised the possibility that model itself is mis-specified, and could consequently not support the author's preferred scenario. The CPT requested a revised assessment be presented. The revised assessment should be based on $M = 0.18\text{yr}^{-1}$ and gamma = 1. The revised assessment was presented on Friday of the CPT meeting and is included in the draft SAFE report for May 2009.

Next year's assessment should explore the implications of including bycatch and discard estimates in the assessment and also include the total catch for the year to date and compare this against the model assumptions of catch. The subsequent assessment should include a Tier 5 calculation.

St Matthew blue king crab:

Jie Zheng summarized changes to the assessment for St. Matthew blue king crab. The team discussed the residual patterns (which suggest a lack of independence within years) and likelihood components. Some suggestions included formulating the likelihood component for the catch and survey-at-length (currently assumed to be independent between size-classes) as total catch/survey index and proportions by size-class (as in the snow crab assessment). The CPT noted that scenario 4 did not fit the data adequately. The team again requests confidence intervals on survey estimates and in tables and figures.

The author recommended scenario 2. The CPT requested a sensitivity analysis or additional justification on the molting probability penalty.

The CPT discussed the years used to calculate the proxy B_{msy} (B_{ref}), noting that the current B_{ref} depends on the selected years. Because this stock has never been fished at B_{msy} , B_{ref} is poorly estimated. Consequences of a potentially inappropriate basis for the B_{msy} proxy include an arbitrary determination of increased stock status. There is a dichotomy between indications of

depressed stock status and model estimates of stock rebuilding. The team notes that absent any changes to B_{ref} , it is likely the final assessment in September will indicate the stock to be rebuilt.

No crab pot bycatch was included in the assessment this year and last, and the model only considers males, so the current OFL only pertains to retained male catch. Reiterating a previous request, the team would like to see bycatch included in the September 2009 final assessment so that a total catch OFL can be calculated for this stock. The team continued discussion of inherent issues with B_{ref} estimation, but could not find a better approach than that used in the assessment. The team noted that the qualitative perception of stock status is unchanged regardless of B_{msy} proxy chosen, but that substantial analysis is needed to better estimate an appropriate B_{ref} for this stock. A different form of analysis may be needed to better estimate B_{msy} .

Eastern Bering Sea Tanner crab:

Lou Rugolo summarized the EBS Tanner crab assessment. The team discussed the potential impact in future assessments of corrected bycatch estimates given the previous discussion of groundfish pot bycatch. Currently the model does not separate crab bycatch in the various groundfish fisheries by gear type (trawl, longline, pot) in assessment.

The final assessment will compare observed discard losses against model predictions for groundfish trawl and opilio pot fisheries. The team noted that caveats were necessary in all tables regarding draft OFLs for the May draft assessment in order to be clear that values listed in the assessment are not the final 2009/2010 OFLs. The team approved the author's recommendation for model parameters and the time period for B_{ref} .

The author noted that work continues on a length-based model extending to 1968 for this stock, with preliminary model structure tentatively to be presented at the September 2009 CPT meeting.

Snow Crab:

Jack Turnock summarized the snow crab assessment; no structural changes were made to the model this year. The previous assessment included many modifications in response to a 2008 CIE review. The CPT noted that of the team's comments from the previous year, the assessment author only addressed requests for better documentation; the CPT expects hopes comments on future assessments will be considered on an annual basis.

André Punt noted that, after recoding in ADMB and FORTRAN, the model performs as specified, representing a validation on model specification.

Jie Zheng noted that the CVs for the survey data were reduced below their actual values, and expressed concern that the survey data are being overweighted. Further discussion was deferred to the assessment/weighting workshop. The CPT recommended that the survey CVs not be reduced next year; rather the weights on other data components should be reduced. The retrospective analysis should be repeated as reweighting may cause substantial changes.

The team discussed rebuilding probabilities for this stock; 2010 is the 10 year benchmark for the rebuilding plan. At issue is the probability of the stock being above B_{msy} in 2009/10 and 2010/11 (a rebuilt status is defined as two consecutive years above B_{msy}). Based on the assessment analysis, to obtain a 50% probability of rebuilding to B_{msy} in 2009/10 will require a fishing mortality rate which is 16% of F_{35} .

The team discussed projecting forward in 2009/10 for determination of whether or not the stock is above B_{35} . There are some timing issues to be clarified with respect to when this determination is made, and using which data (i.e., forward forecast to following spring or backwards hindcast of previous year using new data and looking backwards). The CPT requested a clarifying letter from NOAA RO and/or NOAA GC regarding the process and steps necessary towards rebuilding the stock to B_{35} within the rebuilding timeframe with the accompanying rationale and analysis for reference to the rebuilding trajectories contained in the stock assessment. The team requested that this letter also include information on what happens if measures are taken to rebuild the stock in this time frame and it does not rebuild.

The CPT recommended that the total catch during 2009/10 be no higher than that corresponding to the harvest rate which would lead to a 50% probability of rebuilding to B_{35} beginning in 2009/10, as determined by the probability projections in the final stock assessment in September 2009.

CPT recommends that the snow crab assessment in September 2009 include explicit information detailing snow crab bycatch in the groundfish fisheries by gear type (pot, trawl, longline) as well as model assumptions of bycatch. The CPT also requested the author to revise the write up of snow crab assessment document considering previous recommendations for completeness, for example, incomplete reference list remains the same year after year, etc.

Bristol Bay red king crab:

Jie Zheng provided an overview of the BBRKC assessment. A CIE review of this assessment will occur in June 2009.

The CPT commented that the assessment needs to include the model configuration used previously (last year) for comparison against any new scenarios. It is hard to understand the implications of model changes without the results for the original configuration.

This year's assessment included additional natural mortality (males and females 1980—1984; females 1976-1979 and 1985-1993) and two scenarios included data from the 2007 and 2008 BSFRF surveys. The team discussed the inclusion in the assessment of a prior for catchability obtained by comparing the BSFRF and NMFS indices, and noted that it was not correct to use the priors as well as the BSFRF and NMFS survey data, as this leads to some of the data being "double-counted". The team noted that it was difficult to assess the fit to BSFRF data in the absence of diagnostic statistics. As a general rule, any data utilized must be listed in the assessment document. There were also large difference in the biomass estimates during the late 1970-80s between scenarios with and without the BSFRF data, but why inclusion of these 2007 and 2008 survey data should impact early biomass estimates was not clear. Finally, the CPT queried the lack of information on the length-composition of the BSFRF survey. Jie noted that he did not receive any length-composition data for that survey.

CPT discussed the appropriate time period for defining B_{ref} , noting the author's suggestion to use 1995-2008. The CPT previously requested additional time periods for B_{ref} to facilitate fuller discussion.

Although the overall fit to the data as presented may suggest the use of configuration model 1, the team recommends scenario 3 as the preferred model primarily because the BSFRF data are not documented, and model fit is not presented, in the assessment. Although scenario 3 has the fewest changes (no BSFRF survey) from last year's assessment, the increase in biomass in recent

years is difficult to understand. Some members felt that the information as presented was insufficient to retain this stock in Tier 3 and discussed dropping it to Tier 4.

The team discussed, extensively, the time period to use in defining B_{ref} , with recommendations for further analyses to differentiate changes in the model. Some team members felt that the years presented for B_{ref} consideration should also include a pre-collapse time period (1968-1980). Other members noted that we have excluded years of high harvest rates prior to a collapse for other stocks. Some team members suggested that for consistency we should either use all the data and do this for all stocks, or take only the recent conditions. For this stock we could also exclude the high harvest rate and crash years, but include the available information before and after the excluded years. Ultimately, the team considered the following time periods for B_{ref} :

- 1- all years
- 2- current year set (1995-2008): current environmental conditions
- 3- only pre-collapse (not yet presented)
- 4- 1985-2008 included

The team discussed the relationship presented in Figure 35 of the assessment, noting that serial correlation and, thus, time, may be more important than MMB in terms of stock productivity. Team members noted that recruits per spawner may provide a better indicator than the Figure 35 relationship.

The majority of the CPT favored the author's suggestion to base B_{ref} on 1995-2008, but this was not a consensus position given issues noted previously.

Different crab stock are currently treated inconsistently with respect to periods of productivity. The team requests additional presentations next year on the changing conditions and productivity in the Bering Sea and its possible relevance to crab stock dynamics. Team members noted, however, that while changing conditions in Bering Sea can be characterized, it is unlikely that the impacts of such changes are consistent across all crab stocks, as they are likely highly stock-specific.

Aleutian Islands golden king crab:

The CPT considered assessments for AIGKC based on Tiers 4 and 5, noting that the OFL for this stock needs to be determined at this meeting because the fishery opens in August. Siddeek presented an overview of his AIGKC assessment model. The team discussed to what extent the eastern and western components represent a single stock. Subsequent discussion noted that there is currently only a single stock-wide OFL; to establish separate OFLs by region would require an FMP amendment. The model assumes mixing between stocks and the team recommends evaluation of CPUE disaggregated by the hot spots to see if there are similar trends in each area.

The CPT, noting that the penalty on fishing mortality was not well documented, discussed the use of CPUE with respect to the relevant SSC comment (i.e. the SSC did not intend for CPUE to be removed entirely from assessment, but their intent was instead that consideration be given to scenarios with and without these data).

Other comments on the model:

- Fits to the discard size-composition data suggest that the model is mis-specified.
- Retained selectivity: Three selectivity patterns were included in the assessment; the CPT was unclear what fully-selected F means when selectivity does not reach 1.0 at any size.
- Discard of large crab: the model suggests that some large crab are not being retained. It was also noted that some large crabs known as "leather backs" may be discarded

- Equation 25 may be redundant since catch is already in Equation 21, although it should be clarified what is observed and what is predicted, and model sensitivity to removal should be examined.
- Note that the penalties are in different units such that equivalent penalty terms can have substantially different effects on model performance.
- Equations 10 and 11 - clarify typos on variables for C and D
- Recommendation to include scenarios with and without commercial CPUE data.

The CPT agreed that the draft Tier 4 assessment reflects a considerable improvement on last year's approach, but that, as noted above, further work is needed before this assessment can form the basis for management advice.

Linda Kozak recommended that the author look at model runs with only post-rationalization CPUE given some concerns that deadloss/discard numbers seem inaccurate and there may be extrapolation issues.

SSC did not agree with the CPT recommendation for the retained catch OFL time period for this stock in 2008/09. The author presented 3 time periods for consideration for the 2009/10 fishing season, all within the 1985/86–1995/96 time period of unconstrained catch under the current size limits: 1985/86–1995/96; 1987/88–1995/96; and 1990/91–1995/96. The author noted that observer data on bycatch from the directed fishery is too incomplete to provide estimates of total catch for the time periods under consideration; there is no observer data from the directed fishery prior to the 1988/89 season and observer data are lacking or confidential for at least one management area in the Aleutian Islands for four seasons of seven seasons during 1988/89–1994/95. The CPT discussed justification for why the team continues to disagree with the SSC recommendation from 2008/09 to use the full 1985/86–1995/96 time period to compute OFL. The CPT did not want to include consider the early years, 1985/86–1989/90, within the period when catch was unconstrained. During the early years of the unconstrained catch period, annual catch and catch rate decreased dramatically and appears to have not been sustainable. As a result the CPT chose the later period of unconstrained catch, 1990/91–1995/96, that provided more stable harvests and was prior to constrained catch period.

The CPT recommends the use of the time period from 1990/91-1995/96 for a retained catch OFL of 6.93 million, although this recommendation was not unanimous.

Pribilof Island red king crab:

Bob Foy presented an overview of the PIRKC assessment. There were no proposed changes to last year's approach to OFL calculations. Comparative information on a B_{msy} proxy with years based on average survey abundance over 1980-2009 will continue to be included in the final assessment. Updated survey information using the updated dataset were provided. Final stock status and resulting OFL will be provided in the final assessment with incorporation of the 2009 summer survey.

The September 2009 revision will provide comparisons on how model calculations would have changed had the corrected survey information been included last year.

The team agreed with the author's recommendations on the basis for the B_{msy} proxy as well as for the model parameters.

Pribilof Islands blue king crab:

Bob Foy provided an overview of the PIBKC assessment. Discussion of the rebuilding plan alternatives for this stock was scheduled for Friday. No changes to the assessment are proposed this year. The updated survey time-series was used in the assessment.

The author reviewed the non-directed OFL recommendation from September 2008 and updated information from the 2008 Pacific cod pot bycatch. Pacific cod pot bycatch was revised downward from preliminary estimates, but still represents approximately 8,000 lbs of bycatch in the fishery for 2008. However, in 2008/09 to date there was limited bycatch (~30 lbs) accruing against the 4000 lb non-directed OFL.

The team agreed with the author's recommendations on the basis for the B_{msy} proxy as well as for the model parameters.

Pribilof Islands golden king crab:

Doug Pengilly provided an update on the forthcoming Pribilof Island Golden King Crab (PIGKC) assessment. No documentation was provided at this meeting given that there is no new information to be included in the OFL calculation for 2009/10. The team supported the authors recommendation to use the same years for calculating the retained catch OFL for this stock. Bycatch data will be compiled and included in the September assessment.

Adak red king crab:

Doug Pengilly provided an update on the OFL recommendation last year for Adak RKC. The SSC differed from the CPT in their 2008/09 OFL recommendation. Doug provided an overview of information to be included in the 2009 September assessment report and that a pot survey in the Petrel Bank area is planned for November-December 2009. The team discussed OFL options as presented in the presentation by the author including status quo, alternate time periods and an OFL based only upon the Petrel Bank region. No total catch OFL computation is provided at this time due to the lack of observer data on bycatch during this fishery prior to 1988/89 and confidentiality of observer data from the fishery during the 1990/91, and 1992/93–1994/95 seasons. Given the gaps in data on bycatch from the directed fishery, a total catch OFL can not be directly estimated for the time period that the retained catch OFL for 2008/09 was based on (1985/86–2007/08). Hence the author recommended that the 2009/2010 OFL for fishery be established as a retained catch OFL. Bycatch estimation for this stock remains problematic and the team reviewed previous discussions regarding options for a bycatch-only OFL; options for different retained catch OFL; and means to estimate bycatch for a total catch OFL.

The team recommends establishing an OFL for this stock consistent with the approach recommended by the SSC last year (as a retained catch and freezing years considered through 2007/08). The team reiterates previous concerns about stock status and outlook for this stock and data collection priority.

Linda Kozak commented that industry would like to participate in survey this year to help define areas surveyed. She commented that industry is specifically not fishing in areas where Adak RKC would be found as bycatch in the golden king crab fishery.

CPT recommendation on Tier 5 stock assessments. The timing for final assessments for Tier 5 stocks should be done annually in May and only brought back to the CPT as an agenda item in September should there be new information over the summer and/or modification to CPT recommendations from the SSC. This year the other two Tier 5 assessments (Adak RKC and PIGKC) will be finalized in September; next year they will be on the May schedule.

Workshop:

A separate report is being prepared for presentation to the CPT in September for the stock assessment/data weighting workshop in which the CPT participated May 13-14. Some issues pertinent to the CPT discussion and SSC review this spring included the following:

- Ecosystem chapter: Proposal that some ecosystem considerations by crab stock be provided by the Kodiak lab for presentation at (an extended) May 2010 meeting, with the idea to move toward further consideration in individual stock assessments or as a summary over time as applicable.
- Economic chapter possibly to move in similar direction.
- Terms of Reference for assessments will be finalized and circulated at the CPT September 2009 meeting.

Pribilof Island blue king crab rebuilding plan alternatives

As a follow up to last year's discussion of the need to revise the Pribilof Island blue king crab rebuilding plan, the team discussed the rebuilding plan alternatives put forward last September. The team understands the Council will be considering initiating an analysis for a revised rebuilding plan at the June 2009 meeting.

The alternatives put forward by the team last year are:

1. PIHCZ closed to all groundfish fishing.
2. PIHCZ closed to Pacific cod pot fishing.
3. Analyze ADF&G crab closure areas applied to all groundfish and just Pacific cod pot fishery: between 168 and 170 W long., and between 57 and 58 N lat.
4. Analyze new closure configurations which cover the entire distribution of the PIBKC stock (all groundfish or Pacific cod pot fishery only).
5. Gear modifications to Pacific cod pot gear that could reduce bycatch of blue king crab.

An additional alternative was put forward by the stock assessment author regarding increased observer coverage. The team noted that increased observer coverage will improve estimates of catch accounting, but is not necessarily a rebuilding alternative.

The team discussed a combination of full observer coverage on the pot cod fleet and caps on PIBKC bycatch in that fleet as a possible proposed alternative. Members of the public suggested both cap alternatives be considered, as well as consideration given to current enhancement efforts.

The team suggests considering all of the previous alternatives with the exception of gear modifications (# 5 above). While the team encourages on-going efforts in gear modification there does not seem to be anything on the horizon that would be immediately applicable to the recovery of PIBKC given that the time frame for this rebuilding analysis.

The team highlights the issue of observer coverage in the pot Pacific cod fishery and notes that increased observer coverage in this fishery would be beneficial in providing better bycatch estimates for blue king crab.

The team recommends addition of a PSC cap in other fisheries to the list of alternatives for consideration in a revised rebuilding plan. The team encourages on-going research on enhancement collectively with the corollary research on larval transport and habitat. The team notes that enhancement efforts at the Seward shellfish hatchery remain experimental and unproven at a production level in the near term. However, the team would welcome a presentation on enhancement efforts and their possible link to stock recovery for this species.

Trawl Sweeps

Diana Evans (NPFMC) and Craig Rose (NOAA-AFSC) provided an overview of the proposed trawl sweeps gear modification and related revision of the St Matthew Habitat Conservation Area (HCA) being put forward for initial review to the Council in June 2009. The analysts were seeking CPT input on the appropriate extent of the St. Matthew HCA to adequately protect St. Matthew blue king crab stock. They were specifically seeking guidance on the eastern boundary of the HCA in relation to the “finger” area.

The team questioned to what extent the proposed trawl sweeps will be appropriate to protect king crab; Craig Rose noted the modified sweeps reduced bycatch of Tanner and snow crabs and that research this summer will provide information specific to king crab.

The team discussed the spatial extent of a recovered BKC stock compared with current catches representative of the recovering stock. Team members noted that the previous St. Matthew king crab stock comprised a much broader spatial distribution than the current stock which has been compressed spatially as well in abundance since its collapse and subsequent (current) rebuilding phase.

The CPT did not recall being consulted on the original St Matthew HCA configuration prior to Council action on the closure. Previous discussions with the CPT from Council analysts had indicated some interest in protecting St. Matthew BKC and EBS snow crab stocks, but actual closure configurations were not proposed to the CPT. The focus of previous discussions was related to the spatial extent of the snow crab stock. The CPT requested additional time to comply with the Council’s request for comment on the adequacy of the current St. Matthew HCA as it relates to the St. Matthew BKC stock.

The CPT was asked to comment on both the adequacy of that closure as well as concerns or recommendations with modifying the current finger-configuration of the gear modification closure. John Gauvin stressed the importance of this region for the rock sole fishery. The team noted that the western edge of the finger region gets into the distribution of females of the St. Matthew BKC stock. The team discussed that its preference is to wait for results of the proposed summer pot study to make a recommendation on the appropriateness of the closure area.

The CPT would like to better evaluate the closure configuration of the HCA in September and tasked Bob Foy with providing updated information to the team in September on the St. Matthew BKC distribution in relation to these closure boundaries. The CPT would also like to see a more detailed depiction of groundfish fishing effort around St Matthew Island. The team recognizes that this delay might require follow-up analysis to what is proposed for Council review in the fall, but the team did not feel fully qualified to make these recommendations without further discussion and evaluation. The team requested further information on the fishery distribution in this region as well as information on the sex distribution of St. Matthew BKC in NMFS crab survey in this region. The team notes that the distribution of snow crab may also be affected by the proposed trawl area.

Crab Prohibited Species Catch limits in Groundfish and Scallop Fisheries:

Diana Stram summarized the existing crab catch limits in the BSAI groundfish and scallop fisheries. The team has noted multiple times that these limits should be reevaluated in the context of new crab OFLs and the lack of feedback between crab and groundfish FMPs, particularly with respect to crab bycatch in the BSAI groundfish fisheries, and that these catches currently accrue towards crab OFLs under the Crab FMP. Any impact on catch levels as a result of an overfishing

determination for exceeding a crab OFL will only be counted against the directed crab fishery regardless of what caused the catch to exceed that level (e.g., even if it was caused by excess bycatch in the groundfish fisheries). Currently PSC limits in the BSAI groundfish FMP exist for red king crab, Tanner crab and EBS snow crab in the trawl fisheries only as time/area closures triggered by PSC caps. There are no crab bycatch limits in any fixed gear groundfish fisheries.

Given the issues brought forward from the NMFS RO on fixed gear bycatch, the team recommends a reevaluation of groundfish and scallop PSC limits in light of crab stock sizes, total catch OFL structure and changes in the groundfish fisheries fishing practices, fleet sizes, etc. For all stocks with a total catch OFL, a means is needed to allocate shares of total catch between directed and non-directed catch, including all gears. Consideration should also be given to the actual sizes of crabs caught since currently limits are formulated solely on number of crab (with no distinction on size, sex, or maturity). The CPT encourages the Council to initiate an analysis of all PSC limits for crab species under the new catch OFLs.

The team further notes that the use of total catch OFLs allow for setting upper limits (caps) to bycatch and that upper limits (caps) may be needed to assure that the total catch OFL is not exceeded. The team further noted these catches may or may not represent a conservation problem but regardless the current system may cause problems for the directed crab fishery as populations decline and this could be affecting crab stock recovery. An analysis of the appropriateness of the current bycatch and limits would indicate to what extent this additional catch in other fisheries is affecting individual crab stocks.

While this may be primarily an allocation issue in terms of who catches the crab and where the control mechanisms lie with no feedback to other FMPs, it could hypothetically drive an overfishing determination. All sources of fishing mortality should have controls, including bycatch from the non-directed fishery.

Jim Stone noted that scallop bycatch limits are structured based upon biomass thresholds and fishery closures have occurred in the past for crab bycatch. He also commented that the fleet operates responsively to avoid areas of high crab bycatch. The team noted that bycatch of Tanner crabs in the scallop fishery is not the dominant issue, and clarified that the primary concern is crab bycatch in groundfish fisheries in terms of the potential to drive overfishing. The team does recommend however that assessment authors consider all sources of crab mortality, including bycatch in the scallop fishery, when compiling assessments, something that has not always been done.

Crab Economic SAFE discussion:

Brian Garger-Yonts provided an update on discussions by the CPT economic working group in structuring a forthcoming comprehensive Crab Economic SAFE chapter. He provided both short and long-term objectives for the economic SAFE for Crab. The team discussed the timing of presentation and production of an economic SAFE chapter and indicated that September is the appropriate time for that information to be presented in conjunction with the final Crab SAFE report. Brian provided an overview of many issues relative to production of this report, including the status of available data, data quality review, and the annual and 5-year reports produced in conjunction with the Crab Rationalization Program. Also discussed was development of a secure data portal housed and maintained by AKFIN that will provide authorized users with access to microdata and pre-defined aggregate statistical information integrated from all ADFG/CFEC and NMFS databases relevant to the BSAI crab fisheries.

He reviewed the Crab Economic Data Report data quality assessment process as directed by the Council. While recognizing the cooperation and time devoted by the PNCIAC membership in the assessment, he requested a means for the CPT to participate in future data quality evaluation. He suggested that the involvement of the CPT in evaluating data quality and recommending standards for data quality assessment would add an appropriate layer of scientific review to the existing process.

A proposed outline of the items to be included in a crab economic SAFE document was provided. For the September 2009 report, the outline follows the model of the BSAI Groundfish Economic SAFE chapter. Garber-Yonts suggested that a more integrated approach to using available socioeconomic information in SAFE reports may be warranted. The team discussed the idea of having a larger workshop to discuss Economic SAFE reports in general (i.e., for groundfish, crab and scallop) and the need for an improved process and clearer objectives for incorporating socioeconomic analysis of fisheries into the fishery evaluation component of SAFE reports.

Jack Taggart suggested that while providing data and tables via AKFIN (as discussed previously) would be useful for analysis and assessment authors, these tables and data should likewise be accessible to the public (Garber-Yonts noted that microdata would continue to be treated as confidential and only disclosed to authorized data users).

The team noted that issues related to data quality may also be incentive-based in that there is a greater incentive to improve data when relative data importance (i.e., their utility in decision-making) increases. Team members further commented that evaluation of crab caught incidentally in other fisheries may help characterize economic losses of bycatch.

New Business:

The team discussed the urgent need to streamline meeting discussions and presentations, noting that this meeting was particularly challenging in content and length. Some ideas include the following:

- Provide presentation outlines for assessment review in May and September.
- No written comments on agenda items distributed to the plan team in advance of the meeting, all comments to be made in person at meeting.
- Add a day to May meeting (May 4 days, September 3 days)

Diana Stram offered to circulate agenda items and discussion timing for September in the next several weeks and draft that agenda very early in order to facilitate streamlining discussion. The fall meeting is scheduled for September 14-16 at AFSC, Seattle. Either ½ day or a full day will be in conjunction with the groundfish plan team meeting depending upon agenda items of joint interest (e.g. ACLs, EFH). An ACL workshop involving many CPT members will occur May 21-22. A report produced as a result of the workshop will be circulated to the entire team by Diana once it is finalized for SSC review in June 2009.

The meeting adjourned at 4:20pm, Friday May 15th.

NPFMC CRAB PLAN TEAM
Draft Agenda 4/13/09vers. –May 11-12, 15, 2009
Traynor Room, AFSC, Seattle

| Monday May 11 | | |
|--|-----------------|---|
| Administration | 8:30 am | <ul style="list-style-type: none"> • Introductions • Additions to agenda and approval of agenda • Review and approval of May 2008 minutes |
| Crab bycatch accounting in groundfish fisheries | 8:45am | <ul style="list-style-type: none"> • Discussion of catch accounting issues for crab stock assessments |
| EBS bottom trawl survey reanalysis | 10:00am | <ul style="list-style-type: none"> • Discussion on recent and planned changes to the 1975-2008 time series for abundance variance calculation |
| <i>LUNCH</i> | <i>12:00 pm</i> | |
| OFL stock assessment review: | | |
| Norton Sound red king crab | 1:00pm | <ul style="list-style-type: none"> • Stock assessment overview • Stock status and OFL determination |
| St. Matthew blue king crab | 2:00pm | <ul style="list-style-type: none"> • Stock assessment overview; changes from previous assessment |
| <i>BREAK</i> | <i>2:45pm</i> | |
| EBS Tanner crab | 3:00 pm | <ul style="list-style-type: none"> • Stock assessment overview; changes from previous assessment |
| Bristol Bay red king crab | 3:45 pm | <ul style="list-style-type: none"> • Stock assessment overview; changes from previous assessment • Plans for CIE review focus |
| EBS snow crab | 4:15 pm | <ul style="list-style-type: none"> • Stock assessment overview; changes from previous assessment |
| Tuesday May 12 | | |
| Aleutian Island golden king crab | 8:30am | <ul style="list-style-type: none"> • Stock assessment overview, proposed model-based assessment • CPT tier recommendation for Sept assessment |
| <i>BREAK</i> | <i>10:30</i> | |
| Pribilof Island red king crab | 10:45 am | <ul style="list-style-type: none"> • Stock assessment overview; changes from previous assessment |
| Pribilof Island blue king crab | 11:15 am | <ul style="list-style-type: none"> • Stock assessment overview; changes from previous assessment |
| Pribilof Island golden king crab | 11:45am | <ul style="list-style-type: none"> • Stock assessment overview; changes from previous assessment |
| <i>LUNCH</i> | <i>12:00 pm</i> | |
| Adak (AI) red king crab | 1:00 pm | <ul style="list-style-type: none"> • Stock assessment overview; changes from previous assessment • Discussion of plans for survey and assessment |
| <i>BREAK</i> | <i>2:45pm</i> | |
| OFL Recommendations finalization | 3:00 pm | Review OFL recommendations, Report writing, Report finalization |
| Wednesday May 13 | | Stock assessment/data weighting workshop: agenda TBD |
| Thursday May 14 | | |
| Friday May 15 | | |
| Pribilof Island blue king crab rebuilding plan alternatives | 8:30 am | <ul style="list-style-type: none"> • Discuss preliminary analysis of CPT recommendations for PIBKC rebuilding plan alternatives; • CPT recommendations (to Council) for alternatives |
| <i>BREAK</i> | <i>10:15am</i> | |
| Trawl Sweeps | 10:30am | <ul style="list-style-type: none"> • Council request for CPT comment regarding the boundaries of the St. Matthew HGO (proposed open portion of NBS Research Area) rel to crab stock protection |
| Discard rates/PSC caps | 11:30 am | <ul style="list-style-type: none"> • Overview of origin of discard rates used in groundfish and scallop fisheries, and Plans for BSAI groundfish FMP and Scallop FMP; • CPT recommendations (if necc) re new directions |
| <i>LUNCH</i> | <i>12:15 pm</i> | |
| Economic SAFE discussion | 1:15 pm | <ul style="list-style-type: none"> • Draft SAFE report chapter; results of workgroup discussions (tasked at Sept 08 CF) |
| New business | 3:30 | |
| <i>ADJOURN</i> | <i>4:00 pm</i> | |

NPFMC CRAB PLAN TEAM
Revised agenda remaining 5/14/09 1pm version
 May 15, 2009
 Traynor Room, AFSC, Seattle

| Friday May 15 | | |
|--|-----------------|--|
| Stock assessments: remaining review issues | 8:30 am | <ul style="list-style-type: none"> • Snow crab – clarifying recommendation on rebuilding F rate reduction • Norton Sound RKC-review results of model simulations with $\gamma = 1$, $M = 0.18$ • BBRKC -clarify model choices by CPT • Tier 5 assessments-clarify timing and recommendations by CPT |
| OFL Recommendations finalization | 9:15 am | Review OFL recommendations, Report writing, Report finalization |
| <i>BREAK</i> | 10:15am | |
| Pribilof Island blue king crab rebuilding plan alternatives | 10:30 am | <ul style="list-style-type: none"> • Discuss preliminary analysis of CPT recommendations for PIBKC rebuilding plan alternatives; • CPT recommendations (to Council) for alternatives |
| Trawl Sweeps | 11:30am | <ul style="list-style-type: none"> • Council request for CPT comment regarding the boundaries of the St. Matthew HCA (and proposed open portion of NBS Research Area) rel to crab stock protection |
| <i>LUNCH</i> | <i>12:30 pm</i> | |
| Discard rates/PSC caps | 1:30 pm | <ul style="list-style-type: none"> • Overview of origin of discard rates used in groundfish and scallop fisheries • PSC caps for BSAI groundfish FMP and Scallop FMP; • CPT recommendations (if necc) re new directions |
| Economic SAFE discussion | 2:30 pm | <ul style="list-style-type: none"> • Draft SAFE report chapter; results of workgroup discussions (tasked at Sept 08 CPT mtg) |
| New business | 3:30 | <ul style="list-style-type: none"> • Sept plan team meeting: timing (14-16 Sept), agenda • ACLs-workshop, analyses for amendments, CPT review (winter mtg: discuss timing) |
| <i>ADJOURN</i> | 4:00 pm | |

ALASKA CRAB STOCK ASSESSMENT WORKSHOP

Draft Agenda 3/20/09vers. – May 13-14, 2009

Traynor Room, AFSC, Seattle

| Wednesday May 13 | | |
|--|-----------------|---|
| Administration | 8:30 am | <ul style="list-style-type: none"> • Introductions • Additions to draft agenda and approval of agenda |
| Stock assessment reporting: | | |
| Stock Assessment TOR | 8:45 am | <ul style="list-style-type: none"> • Punt presentation (30 minutes) • Discussion / modifications • ACL / OFL needs |
| <i>BREAK</i> | <i>10:30</i> | |
| Stock Assessment TOR | 10:45am | <ul style="list-style-type: none"> • Stock-specific actions • Data rich – snow crab • Data moderate – AI Golden king crab • Data moderate – Norton Sound red king crab |
| <i>LUNCH</i> | <i>12:00 pm</i> | |
| Data weighting and diagnostics: | | |
| Practices in other assessments | 1:00 pm | <ul style="list-style-type: none"> • Hulson overview (30 minutes) • Ianelli presentation (EBS pollock) (20 minutes) • Dorn presentation (GOA Pollock) (20 minutes) • Dichmont presentation (Australia) (20 minutes) |
| <i>BREAK</i> | <i>2:45pm</i> | |
| Initial Recommendations | 3:00 pm | <ul style="list-style-type: none"> • Group discussion – what is appropriate for crab • Initial recommendations – data weighting • Initial recommendations – diagnostics • Workplan for overnight analyses |
| Thursday May 14 | | |
| Reprise | 8:30am | <ul style="list-style-type: none"> • Results of overnight analyses • Snow crab (Turnock) • Red king crab (Zheng) • AI Golden king crab (Sideek) • Norton Sound rd king crab (Zheng) |
| <i>BREAK</i> | <i>10:30</i> | |
| Final recommendations | 10:45 am | <ul style="list-style-type: none"> • Synthesis of examples • Final recommendations – data weighting • Final recommendations – fit diagnostics |
| <i>LUNCH</i> | <i>11:45 am</i> | |
| Overfishing levels for Tier 4 stocks (calculating Gamma): | | |
| Background and history | 12:45 pm | <ul style="list-style-type: none"> • Quinn presentation (background) (20 minutes) • Current approach (Stram / Punt?) (20 minutes) • Likely stocks for Tier 4 (group) |
| Proxy approaches to estimating $F_x\%$ | 1:45pm | <ul style="list-style-type: none"> • Maturity • Selectivity • Natural mortality • Growth |
| <i>BREAK</i> | <i>2:45pm</i> | |
| Reprise | 3:00 pm | <ul style="list-style-type: none"> • Recommendations |
| Conclusions | 4:00 pm | <ul style="list-style-type: none"> • Overview of recommendations (Punt) • Plans for September CPT meeting |
| <i>ADJOURN</i> | <i>4:00 pm</i> | |

