

Crab Plan Team Report

The Crab Plan Team convened their May meeting from May 22-24, 2007 at the Alaska Fisheries Science Center in Seattle, WA.

Members present included the following:

Forrest Bowers (ADF&G-Dutch Harbor), Chair
Ginny Eckert (UAF/UAS), Vice-Chair
Diana Stram (NPFMC)
Doug Pengilly (ADF&G-Kodiak)
Gretchen Harrington (NMFS-Juneau)
Wayne Donaldson (ADF&G-Kodiak)
Jack Turnock (NMFS/AFSC-Seattle)
Shareef Siddeek (ADF&G-Juneau)
Herman Savikko (ADF&G-Juneau) by phone
Lou Rugolo (NMFS/AFSC-Kodiak)
André Punt (Univ. Of Washington)
Bill Bechtol (UAF)

CPT member Josh Greenberg (UAF) was absent.

Members of the public (and state and agency staff) present for all or part of the meeting included: Tom Casey, Dick Powell, Linda Kozak, Florence Colburn, Rob Rogers, Doug Wells, Heather McCarty, Jack Tagart, Arni Thomson, Anne Hollowed (AFSC), Tony Allison, Einar Sorvik, Doug Woodby (ADF&G), David Barnard (ADF&G), Jie Zheng (ADF&G), Pat Livingston (AFSC), Margo Posten, Keith Colburn, Phil Hanson, Kevin Kaldestad, Steve Hughes, Lance Farr, John Boggs, Tom Suryan, Gordon Kristjanson.

The attached agenda was agreed upon for the meeting. However, due to the fact that the review of the crab overfishing definitions analysis took the majority of the allotted time for the three day meeting, the team was unable to address many of the items on this agenda. The agenda, which is attached as Appendix A, shows in strike-out format those items that the team was unable to address due to time constraints. To the extent possible these items will be included in the September 2007 CPT meeting agenda.

Discussions in this report have been reorganized from the order in which they were addressed in order to highlight those agenda items that the team was able to discuss. The remainder of the report (from page 3 on) contains the technical review comments by chapter of the crab overfishing definitions analysis.

New Membership

The team welcomed the participation of two new members: Dr. André Punt of the University of Washington and Ph.D. candidate Bill Bechtol of the University of Alaska-Juneau. These two members were solicited given their expertise in stock assessment and modeling (Punt) and crab biology (Bechtol). The team had previously noted that it would benefit from additional expertise in these two areas. The team also noted that the Lab Director position in Kodiak (NMFS RACE Division) previously held by Dr. Bob Otto has now been filled and the team looks forward to the participation of the new director, Dr. Bob Foy as a member of the CPT to fill the vacancy left by

Dr. Otto. The team anticipates that Dr. Foy will be available to participate beginning in the Fall of 2007.

Scheduling

The team tentatively scheduled their next two meetings for:

- (a) September 12-14, 2007.
- (b) May 6-8, 2008

The team also notes its intention per previous discussion to have all plan team meetings take place at the AFSC in Seattle, to the extent possible, noting that the cost for team member travel is similar to other areas while the ability to have additional staff and public participation by holding the meetings in Seattle is improved.

Annual Catch Limits and Accountability Measures

The team discussed the new MSRA requirements for all FMPs to include Annual Catch Limits (ACLs) and Accountability Measures (AMs) by 2010 (for overfished stocks) and 2011 (for all other stocks). The agency is compiling guidelines to be released regarding how ACLs are to be defined. This could have an impact on current crab management if the ACL is defined as a limit (TAC < ACL < OFL) rather than a target. How this is to be defined and what buffer may be necessary is still being determined. Other aspects for MSRA that could have an impact on crab management include how data-poor stocks are to be dealt with, as well as a mandated peer review process.

External review of stock assessment guidelines

At the request of the SSC, the team revised the external guidelines for stock assessment review in accordance with the timing and specific needs for crab management. The team suggests further revision of these guidelines if necessary following the results of the already-requested snow crab review. The adopted guidelines are attached as Appendix B.

Research Priorities

The research priorities approved by the SSC in 2006 were reviewed by the team. Understanding that the SSC will again review and modify this list at the June 2007 meeting, the team suggests the following changes to the approved list of crab research priorities:

Additions to the existing list:

- Index of abundance for Tier 5 and 6 stocks (methods for creating indices for unsurveyed stocks)
- Handling mortality estimates to provide accuracy to assessment models

Edits to existing list (numbered according to original list):

#1-Delete parenthetical referring to “(except BBRKC)”

#4- Reiterate priority for fertilized egg production index. Add to first sentence: “... contribution by males as a function of size, time post molt, and their distribution during the survey and fishery. The outcome of this exercise is to obtain a spawning index that could be utilized to estimate spawner recruit relationships.”

Bering Sea Crab EFH measures considered by Council

The team was informed of measures under consideration by the Council in conjunction with Bering Sea Habitat Conservation. Understanding that the Council intends to take final action at the June 2007 meeting, the team took the following motion (unanimous):

The CPT recommends that the NPMFC carefully consider all available information on king and opilio crab abundance and location when developing the Bering Sea Habitat Conservation plan. The CPT supports studying this northern area to evaluate to what extent this area represents important crab habitat and the CPT supports studies on the impact of bottom trawling on crab habitat and stocks. Further, should the Council move forward with development of a Northern Research Area management plan, the CPT requests participation and consultation in the development of this plan as it relates to protection measures for crab habitat and an analysis of this in conjunction with existing crab bycatch limitation zones.

Review of Crab Overfishing Definitions analysis (Proposed amendment 24)

The team spent substantial time reviewing each chapter of the Initial Review draft of the Amendment 24 Environmental Assessment to revise the crab overfishing definitions. Comments below are organized according to chapter, with general comments on organization, revision across the Chapter (or document) listed first followed by page-specific revisions. Understanding that staff have already compiled an errata sheet to be distributed to the SSC at this meeting these corrections are not repeated here. Following a thorough review of the entire document, the team discussed the necessity of further CPT review and discussion of the analysis prior to Council final action. Accordingly, the CPT requests that the team have a chance to review the analysis in September prior to being released for the Public Review Draft.

Chapter 1 (Introduction):

Incorporate MSRA requirements as necessary into the purpose and need section of this chapter.

Chapter 2 (Description of alternatives)

In general and across the description of all of the alternatives, there is a need to be explicitly clear regarding what is being adopted specifically and what is being frameworked in this analysis. Eventually there should be a single summary table included in this chapter of stock, tier level, MMB, OFL.

The team clarified that for Tiers 1-3 the OFL will be for all removals (crab and non-directed fisheries). Previously it had been discussed that only the directed fishery F would be utilized as a benchmark for comparison with an annual review of landed catch for the determination of overfishing in conjunction with an annual review of whether the assumptions in the model with respect to discards and catch in other fisheries are still correctly specified. The application of the OFL has now been clarified to involve comparing the total catch (total for all crab fisheries, directed and non-directed as well as groundfish fisheries) annually with the OFL (from model simulations that include estimates of all losses) where the latter will include all removals for the stock. The ideal OFL for all Tiers will be all removals (crab and non-directed fisheries). However, for Tiers where a total catch OFL is not possible, a retained catch OFL will be used. Two notations are suggested for use in the analysis: C(OFL) to indicate total catch OFL and R(OFL) to indicate retained catch OFL.

General comment that needs to be clarified in the OFLs: how to address research takes within the OFL?

The team also discussed the potential risk of overfishing females as an unintended result of using MMB as the benchmark for determining overfishing. There is no current feedback to the relative catch of females.

Team members noted the potential difficulty in using separate models for OFL determination and TAC determination. There is an inherent need for consistency in parameterization and formulation between these models.

The document uses several units (millions of crabs, millions of lbs and thousands of tonnes), which can be confusing. Consistency in unit usage will make the document easier to follow.

Section 2.2.1:

Tiers 1-3:

The first paragraph should clarify that F_x is not based on the entire (e.g. male and female) spawning biomass, but rather on the proxy for fertilized egg production (for the analysis MMB).

Alpha and beta:

Explicit language should be added to the description of the alternatives and that of the control rule, with respect to how α and beta β are defined (what values, with what analytical basis). The analysis would benefit from additional justification for the values used in the analysis, as well as criteria for how these values are to be chosen. The sensitivity analysis does not indicate why the particular values used in the bulk of the analyses were chosen, but rather what happens when other values are used. The analysis cannot indicate why the values used in the analysis are more justifiable than other values as different values for α and β primarily lead to different trade-offs between the rate of recovery of overfished stocks and the catch during the rebuilding period. The choice of values for α and β will be primarily a policy call (with precedent in other NPFMC fisheries for this). Given that these values should ideally not change annually, some consideration should be given to hardwiring these into FMP or at the least indicate that they should not be annually modified. A figure should be included (perhaps in the methodology section) which demonstrates the different α and β scenarios that were evaluated in the analysis.

Tier 4 description:

The language describing Tier 4 should be clear that these are stocks for which there is no information on recruitment or ability to estimate spawner-recruit relationship.

Page 11: Revise first sentence to read: Tier 4 is for stocks where essential life-history information and understanding is lacking.”. Strike third sentence (“The most important parameter for Tier 4 is γ ”).

Page 12: Revise the wording at the top of the page re “gamma should never be set...”. This statement should not have such a strong language regarding “never” as this could be legally indefensible. This statement should be modified accordingly.

Table 2-3:

Note in table that in Tier 4, the value of M is a proxy.

Note in table (footnote) that $F_{35\%}$ is the default value “unless the SSC determines...”, i.e. this value is frameworked, but with an automatic default.

Tier 5 description:

Add description to the Tier 5 alternative that the ideal is that the OFL should be calculated based on total removals (i.e. all sources of non-natural mortality), and that the OFL shall apply to both

directed and non-directed fisheries. If there is no additional information available except for retained catch for OFL determination then this OFL will only apply to the directed fishery (i.e. the OFL under Tier 5 is only calculated based on retained catch and thus only applies to retained catch). Reliable discard data needs to exist over the time period for which the average catch OFL is calculated.

Section 2.2.2 Status Determination Criteria:

This section needs to be reorganized and clarified and needs to be very clear (but concise) how overfishing will be determined (specific steps) by Tier level. It needs subsections for SDC for each Tier, as the current description is for Tiers 2-3 only. There is also a need to include a sentence at the beginning of the section that F_{OFL} applies to a stock and not a fishery) and explain how this is determined. The CPT notes that there is difficulty in estimating non-directed fishery (crab) discards and the potential impact assuming (rather than estimating) these might have on the OFL. Additional consideration should be given to the timing of acquiring catch data in conjunction with the timing of overfishing determinations. This may not be possible within one year of fishing.

OFL is related to the total catch (i.e. all anthropogenic losses “count”). However, the analysis currently lacks clarity on the distinction between the retained catch and the overall total catch comprising the OFL. The analysis does not make it clear how overfishing is specifically determined and what the result of an overfishing determination would be.

Page 15: Second to last paragraph of section 2.2.2: Revise to ensure that non-directed fishery losses are also included in the listing here.

Tier 6 overfishing determination:

Tier 6 overfishing determination remains a major problem. The intention is not that in the absence of information $F_{OFL} = 0$ for all catch (and therefore any catch, including research catch and bycatch is overfishing). The description here needs to clarify that the determination of overfishing only applies to landed catch, including landed incidental catch. Scarlet king crab, which is retained as incidental catch in the AI golden king crab fishery, is an example where any retention would be overfishing unless a non-zero OFL is specified in advance of the season. Non-zero OFLs would be established for Tier 6 stocks in the annual OFL setting and review process according to Option 1 or Option 2. More information is necessary to highlight that a determination should be made regarding which stocks may have some retained catch so as to initiate the process of defining a non-zero OFL for those stocks within the annual review process. The team also had a prolonged discussion on the arbitrary nature of a Tier 6 determination and the potential for confusion between establishment of a meaningful OFL and that of setting a TAC (= 0). The CPT indicated a possible preliminary recommendation that Alt 2 and Option A may be preferable given the implications and problems with Tier 6 formulation. The CPT intends to revisit this discussion after technical review of the full analysis to indicate a preferred alternative.

This section must distinguish between “directed” as defined under Tier 6 as opposed to “directed” as used in discussions in all other sections. In most other sections of the document “directed fishery” is used to indicate “target fishery

Timing of overfishing determination (2 considerations):

1. Retrospective to previous year’s fishery: total catches (all losses) compared to OFL;
2. Hindcast: looking at whether or not the catch for year y exceeded the OFL defined for year y given the information for year y (which will include data for year y).

Additional problems were noted with establishing an OFL as a biomass when the information to implement a biomass-based OFL is not available (i.e. a reliable average-weight relationship to apply for a meaningful catch biomass-estimate for data poor stocks).

André presented a figure characterizing the process of analysis and application of the overfishing determination. A figure along the lines of that below should be included in the revised Chapter 2 to help clarify the simulation process and how (and when) this process interfaces with the stock status determination as well as at what stage (analytically) we move from MMB to total catch. This figure would need to be further modified to include the process of status determination for “overfished” status ($1/2 B_{MSY}$) as well in Year 0.

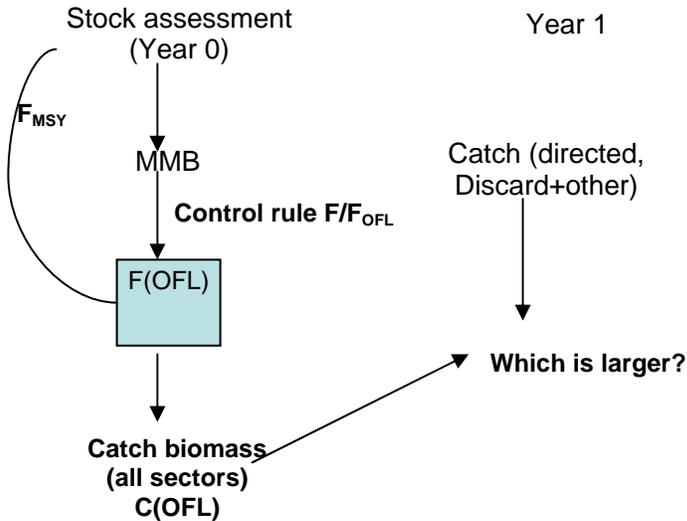


Table 2-8:

Add total removals to clarify that 06/07 F is for the directed fishery only, but that the OFL should include removals from other fisheries. Rearrange this table so it is clear what aspects are related to OFL determinations under alternative 1 (through $OFL(06)=SY$) and what is a separate cataloguing of “what happened” which includes TAC column and 06/07 F rate column. This table should be revised by analysts for presentation to the SSC in June for clarity. This table is intended to compare results across the six surveyed stocks only.

Section 2.7 Comparison of Options:

This section should be revised to include additional information currently contained in Chapter 12. It also needs clarification regarding the mechanics of how an OFL determination under option 1 vs option 2 would occur. It should be clarified that under option 1 CPUE data could also be used and that the situation exists for a potentially high OFL to be established June based on previous year’s data, but for the TAC to be much lower than the OFL if the survey result is much lower than anticipated from the model on which the OFL was based. A potential difficulty with Option 2 is that there is limited time for thorough review of model parameterization.

The analysis needs to clarify that under option 2, the SSC and Council are deciding upon Tier levels only, not that aspect of Tier determination that is dependant upon the stock biomass in comparison to its Bmsy (or Bmsy proxy). (e.g. Tier level 3 not Tier level 3a, 3b, 3c). The choice among “a”, “b” and “c” will depend on the outcome of the assessment.

All tables and figures in section need CVs associated with them.

Table 2-7

add similar footnoting from this table to other tables as necessary to clarify what is frameworked in the alternatives.

Table 2-8

Make it clear that $\alpha = 0.1$ and $\beta = 0.25$

Page 23: Text needs to be extensively rewritten and revised for use in explaining specifics of Table 2-8.

Table 2-9

Add survey CVs. Also perhaps also include the survey estimates of total mature male biomass by year for comparison.

Tables 2-10 and 2-11:

It that not very clear in the text what information this imparts for deciding upon option 1 vs. option 2. There needs to be additional information to clarify this section and to explain how it relates to the choice of option. For example, the first column in Table 2-10 “estimated in terminal year” relates to option 2 while the second column relates to option 1. The remaining columns should be moved to a separate table as they relate to relative model precision rather than an analysis to determine the impact of choosing to use one year old data or awaiting the current year’s data. This whole section should be rewritten to make it clear how this analysis (model-based estimates in terminal year vs. one year projection) related to the choice of options.

Options A and B:

This should be revised so that Option A can also apply to Alternative 3. While most stocks fall under Tier 6 (with default OFL for directed fishing =0), EAI is on the list of stocks for removal, and under alternative 3 (in the absence of option A) an OFL must be determined for this stock (Tier 4)

Chapter 3: Methodology

This chapter needs reorganization. The model description (Appendix A) should be checked to ensure that it is complete (and that all of the parameters in the remaining appendices are defined in Appendix A). Whether values for parameters (e.g. the extent of observation error) are assumed, appropriate justification must be provided. There needs to be additional information regarding how TMB is calculated. This methodology should be explicitly included.

Table 3.1

The listing of stocks by Tiers needs to be revised according to recommended changes for some stocks. The names of the stocks which are candidates for removals under option A should be shaded or highlighted in some other way.

Section 3.1:

The section needs reorganization. This section current addresses two issues: 1) why MMB was utilized and 2) how MMB is defined for simulations. The latter should be moved to a separate section related to the specifications of the simulation model. The MMB section needs to clearly specify why MMB is utilized rather than other measure of spawning biomass. Some of the discussion in this section is currently related primarily to specific Tier levels and is not general for all Tiers and alternatives. Additional information should be included in the appendices (B, C, D) regarding the parameters used to estimate MMB and the male component of biomass under TMB. The methodology section should specifically clarify what size classes and above are included in TMB to explain how it is estimated and the estimation of MMB for different stocks (one model, one survey) including the need for an estimated assumed maturity schedule. Note

that it may be necessary to go back to the amendment 7 analysis (or supporting analyses or clunker program output) for TMB information.

Section 3.2:

This section should be reorganized so its first section reviews the general simulation procedure (what the model simulates) while the next section clarifies how each Tier level is applied. Currently there is confusion between discussion of generic simulation procedure with implementation details for each Tier. It is difficult to ascertain which specification is applied to which model and Tier. Again it is necessary to cross check that the methodology section accurately represents the methodology employed in the simulation itself.

The results for the simulations for species with models should be expressed as a percentage of those for a “reference” management strategy (e.g. the Tier 2 management strategy) to the extent that this is meaningful as this will focus the interpretation of the results on differences among strategies rather than the outcomes in absolute terms.

Table 3.2:

Express the results in terms of the quantities in Table 3-4 (steepness and R_{\max}).

Sections 3.2.6/4.3.2:

Sections discussing α and β need to be reorganized as outlined above. More detail is necessary here on what Fs were utilized.

Tier 4 methodology:

Some additional information should be added here regarding the general approach of excluding specific years for biomass estimation. The current approach seems somewhat arbitrary and it is desirable that there be consistent criteria. The rationale for the specific years to be excluded should be documented and the consequences of excluding these years should be evaluated. Note that the use of these γ values for species other than the ones for which they were calculated is an assumption thus text should be caveated accordingly. Subscript B_{msy} as $B_{\text{msy prox}}$ for improved clarity.

Table 3-6:

Delete this table as it is uninformative.

Page 38: AI golden king crab: Recommend to change wording to indicate that this species is likely move out of Tier 5, but the likely final Tier level is unknown at present.

Section 3.4: Tiers 5 and 6

This section should also be revised to split out methodology for simulation versus the specific application procedures implemented (as outlined above).

Tier 5 methodology:

Some team members expressed concern with the inconsistent approach used in selecting applicable years for the average catch estimate. Additional explanation should be added to indicate that this has been done to try to avoid biases of management actions (e.g. years fishery closed).

Tier 6 methodology:

Need to clarify information in text for all Tier 6 stocks for which a commissioners permit is established and exploratory fishing is likely to continue in the future. A Table should be included

in the Tier 6 impacts section for all stocks which would include fishery history (landings if not confidential) and years, to provide background information to ascertain what information is available for these stocks.

Page 39: Strike sentence “Since OFLs are set...” and replace with a clear explanation that no incidental harvest will be allowed for any species without an OFL under this alternative.

General comments for all species specific chapters and analysis

CVs should be added to all figures (and tables) with survey biomass estimates. There should be separate plots for biomass-related quantities (TMB, MMB, B_{MSY} , MSST, etc) and catch-related quantities (SY, OFL, etc.) and the current plots are too cluttered. When possible, survey TMB and estimated MMB should be included on the same plot for comparative purposes. In general, figures and tables (e.g. Table 4-1 and Figure 4-3) should have equivalent units for comparative purposes.

For impact analysis of model simulations, additional information is necessary to ascertain how trawl bycatch is included in the model and how the model-estimates compare with the historical data. For example, using tables of model-predicted bycatch of females, trawl etc in conjunction with the actual amounts of each. This information could be included in an Appendix. This information should be reviewed annually to assess to determine that model assumptions are appropriate. Additional information should also be added to the discussion of the $F = 0$ scenarios to clarify that the focus of these scenarios should be to evaluate relative rebuilding times not to characterize the allowable amount of trawl bycatch.

For sections where reference is made to a 75% target catch level, these statements should be revised. For Tier 5 species impact discussions where this target level was utilized to compare against the OFL, statements in the analysis need to be removed and revised such that each says “the current GHF is X% of the proposed OFL”

OFLs in terms of catch (either C(OFL) or R(OFL)) must be included explicitly for all stocks.

Chapter 4: Bristol Bay red king crab

Table 4-1:

Revise the label so it is clear that TMB is the area swept estimate at the time of the survey while the February 15 MMB is the model-derived estimate (discounted for natural mortality from the time of the survey). Revise to include both retained catch (R(OFL)) and total catch (C(OFL))

Table 4-1 should be reorganized so that it is clear that columns 1-4 relate to alternative 1 while the remaining columns relate to alternatives 2-3 and retained and total catch OFL values included. This table (and similar ones for Snow crab) should look like the following:

Year	Alternative 1					Alternative 2-3					
	Catch Retained	Catch Total	TMB	%BMSY	C(OFL) Retained	MMB (Feb 15)	MMB / Ref period	%B35	FOFL	C(OFL) Retained	C(OFL) Total

Other notes for inclusion on reorganized Table 4-1:

- Column currently labeled “TAC” should indicate catch
- Clarify that TMB is calculated directly from the survey results, but MMB is computed from the model.

Tables 4-4 through 4-7:

These Tables are difficult to interpret and should be revised to be more focused on pertinent policy level issues. All columns should be scaled to the Tier 2 column for relative impact clarity.

Section 4.3.1:

Paragraph beginning with “Annual determination..” need to be revised according to discussion under Chapter 2 regarding overfishing determination.

Page 45: The paragraph beginning “The change in currency..” needs to be extensively revised for clarity.

Figure 4-3:

The caption needs to be revised to indicate that Fofl in the figure is expressed as legal harvest rates. There is a need to have consistency between Table 4-1 and Figure 4-3 (different units on Figure 4-3 and Table 4-1).

Page 48: The sentence regarding trawl bycatch (over 100 years starting at B_{msy}) is misleading and should be deleted.

Tables 4-2, 4-3:

Need to re-label row indicating “Years fishery closed” as it relates to the $\beta=0$ scenarios (because with $\beta=0$ is no formal fishery closure). This row should be revised to indicate when catch = 0. A plot should be included which shows the control rules (α , β) evaluated in Tables 4-2, 4-3.

Table 4-8:

This table should include the uncertainty about the projection (e.g. similar to Table 5-9 for snow which includes 95% confidence intervals).

Norton Sound red king crab:

Need clarification in Norton Sound description as to data available: should note that trawl survey and pot survey data are available. Additional explanation should be added as to why the pot survey data is not reliable enough to use.

Pribilof red king crab:

The team noted that there is a shift in the perception of stock status from the previous draft as a result of the translation from number of crabs to MMB. This is due to number of large crabs observed (low in number but makes up larger proportion of biomass). This results in an improved stock status from the previous draft (albeit still below B_{msy}). Here stock status differs in alternatives 2 and 3 from alternative 1 and further explanation should be added to the document to clarify this. Including CVs of survey biomass estimates (as recommended previously in the report) will also help in interpreting the difference in stock status under the alternatives.

Page 57: Last sentence should be modified so that it does not mandate that γ will always be set based on Bristol Bay red king crab.

Page 58: Delete last sentence of second to last paragraph.

Dutch Harbor red king crab:

This stock should be included in the list of stocks under Option A for removal to state management based on meeting the listed criteria for inclusion in this option. This fishery has a survey conducted in state waters only; if opened in the future it would be likely to only be a fishery in state waters. Previous harvests have occurred in both state and federal waters, but the relative percentages are unknown. While this is a surveyed stock, the results from the survey are insufficient to estimate stock biomass. The CPT recommend that this stock be moved to Tier 5 under alternative 2 and that under alternative 3 this stock should fall into Tier 6 rather than Tier 4. Additional information should be included to explain why survey biomass estimates are insufficient to characterize this stock.

Adak red king crab:

Page 62: Remove last sentence.

Chapter 5: Snow Crab*Table 5-1*

needs to be updated (as the values given are wrong) and C(OFL) added. Additional table revisions are also necessary here as numbers are incorrect as shown. See comments regarding Table 4-1 revisions and suggestions for new format.

Page 68: The rationale for basing the selection of $F_{x\%}$ and the simulations on a range of steepness values that does not include the “best estimate” (Table 3-4) needs to be provided. Alternatively, Table 3-4 should be deleted if the “best estimate” is not considered reliable. The preference of the CPT is to include the “best estimate” in range as this estimate is lower than the lowest value considered in the analyses. The estimates SR curves for snow crab should be included in the document.

Section 5.2.3.1

Table 5-2 through 5-11 should be in 1000s of tons not just tons.

Tables 5-4 through 5-8:

These Tables are difficult to interpret and should be revised to be more focused on pertinent policy level issues. All columns should be scaled to the Tier 2 column for relative impact clarity.

Figure 5-3:

Showing the time-trajectories of catch and biomass would provide complementary information to that in the Tables.

Table 5-10/5-11:

These tables explore how the management strategies perform if handling mortality differs from that assumed in the other tables and that this is known. However, this analysis only explores where, given perfect information on handling mortality rates, an F_{MSY} control rule that is appropriate for the hypothetically known handling mortality rate can be determined. The problem is that handling mortality is not known and past discussions have highlighted a high degree of uncertainty in the true handling mortality rate. It does not explore how robust the control rule is to errors in estimating handling mortality when managing using, for example, an $F_{35\%}$ strategy. This could be explored by using $F_{35\%}$ defined for the reference value for handling mortality when handling mortality actually differs from the reference value. The simulations for the sensitivity analysis should provide an assessment of how a suite of possible true handling mortality rates can affect recruitment, total yield, retained yield, mature male biomass, mature female biomass, rebuilding time, percent of years below 50% of B_{MSY} and below 25% of B_{MSY} , etc when a control rule that assumes the base-value handling mortality rate is used.

Chapter 6 Tanner crab:

Some specific comments are made on the analysis as it currently stands. However after significant discussion of the model configuration, the fact that the model is for Bristol Bay only, and other information available for Tanner crab, it is the recommendation of the CPT that this section be substantially revised. The species should be evaluated under Tier 4. This would mean that the following additional stock status analyses be included and reviewed in the subsequent draft:

1. recalculate MMB for the whole area (survey based);
2. define γ for Tanner crab from assessment from the Tanner crab assessment for Bristol Bay;
3. calculate B_{MSY} from a defined range of years; and
4. calculate R(OFL) for the whole stock.

The current simulation results (Tables 6-5 though 6-8), although tailored for Bristol Bay, are useful in that they provide information relative to the performance of the Tier rules for a species with a biology similar to that of Tanner crab. However, the text needs to be much clearer that the analyses relate to Bristol Bay only.

The following specific comments should be addressed if the simulation analyses are to be retained

- Section 6.2.2 - strike this sentence as the steepness parameter fit refers back to chapter 3 but no information is available here to support this.
- Figure 6-3 - Given the data, neither of these curves are measurably better than the other.
- Table 6-4 needs to be revised to be similar to suggestions for Tables 4-1 and 5-1.
- Tables 6-5 to 6-8 descriptions need to be revised such that it is clear that assumptions of biological parameters for the Bristol Bay portion of the stock are applied to the whole stock.

The team further discussed the potential for a split OFL for Tanner crab, however, given the fact that the stock is considered to be one single stock at this time, a single OFL is specified. The team notes that further discussion of the potential stock split is contained in minutes of previous CPT meetings.

EAI Tanner crab:

The CPT was concerned with calculating B_{MSY} using the time period 1990-2006 which assumes that population was at B_{MSY} (roughly 40% of unfished state) over this period. Statements must be included in the analysis that indicates that some catch occurred before 1990 and that the biomass in recent years can reasonably be assumed to be close to B_{MSY} .

WAI Tanner:

The team discussed the rationale for the years (1985 – 1992) chosen for defined B_{MSY} for WAI Tanner crab. The CPT recommends that additional information be provide in support of these years (e.g. because these are the years when a fishery occurred).

Option A:

Discussion section focuses upon EAI as a state waters fishery. Need to add Eastern to description so it is clear that these statistics relate to EAI only. The CPT suggested that the text in this section also refer to WAI Tanner crab.

Chapter 7 Blue King Crab

St. Lawrence blue king crab:

Need to add some statements to effect that there is now some interest by CDQ groups to do some exploratory fishing on this stock. An OFL would need to be established in the OFL setting and review process for this to be possible. Some pot surveys have been conducted recently but reports have not yet been published.

Pribilof Blue king crab and St. Matthew blue king crab:

This section needs R(OFL) values for these stocks. Having a retained catch-only OFL could be a potentially difficult issue with stocks under rebuilding plans. The rebuilding plans will likely need to be revised with this information under consideration (for a retained catch OFL only).

Page 107: The description in the overfished section need to be edited to indicate where TMB<MSST historically and where MMB<proposed MSST(MMB) historically for comparative purposes (rather than current text indicating what years the stock was overfished under each currency).

Chapter 8 Golden King Crab

AI golden king crab:

There is a need to add additional information here that the fishery is evaluated on more than just CPUE; it is managed using a combination of fishery-dependant data (observer data and commercial CPUE as well as size composition, shell condition, fecundity, catch rates by size and sex). The TAC has been established as a constant value since 1999.

Additional information should be added to indicate that no formal harvest strategy exists for this stock. It is possible that a formal harvest strategy could be developed for this stock in the future if a model is developed and utilized for biomass estimation and Siddeek indicated that the AI golden king crab model could be evaluated by the CPT in the spring of 2008.

Figure 8-1: A table similar to Table 6-4 should be included in this section to show how often the catch would have been constrained by the OFL in previous years.

Page 112: Recommend that wording is modified here to indicate that this stock is likely to move out of Tier 5 but the final Tier level is unknown at present. The sections on pages 112-113 should be revised so that it is clear what information (e.g. at least proxy M value, a biomass trajectory and means of determining a γ for golden king crab) would be necessary to move up a Tier (e.g. “for Tier 4 the following information would be necessary...”). Note that this would mean that a would all be necessary.

Pribilof golden king crab:

Page 113: Remove sentence on 75% target statement.

St. Matthew golden king crab:

Page 114: Revise sentence beginning “The OFL may not be accurate...” To: “However use of the average catch may not be an appropriate measure for this stock due to the sporadic nature of this fishery.” Note this stock would need an OFL established to remain open.

Chapter 9: Other crab stocks

Table 9-1:

Delete 75% column

Page 117: Revise text (second sentence, 4th paragraph) for clarity that “Tier 5 OFLs were calculated for purposes of this analysis ...”

Chapter 10: Incidental Catch Limits

Discussion of scallop rate-based approach description:

Page 122-123: strike the sentences relating to rate-based approach.

Section 10.5

Per previous discussions, a total OFL for Tier 3 stocks means that all catch in the groundfish trawl and scallop fisheries will accrue towards this catch limit. There is a need to include this in the description in the effects analysis for incidental catch limits.

Chapter 12 Economic and Social Effects:

General comments on this section:

1. It would be more useful if the background information were cross checked and updated to the extent possible.
2. Species names (e.g use Snow crab not opilio) should be consistent with those in the rest of document (use common names).
3. All references cited should be included in reference section (and correctly cited).
4. Either summarize and reference pertinent crab-related aspects in the sections on Existing Community Conditions (12.6) accordingly (preferred) or if it is necessary to excerpt information directly from an existing report it should be indented as a quote and referenced accordingly to make it clear that this is specifically quoted.
5. The headers and organization in chapter 12 should be reorganized so that the section headers and numbering (levels of organization) are correct.
6. Statements such as “recommended for management” should say “for purposes of this analysis...”
7. Reorganize so that impacts of alternative 3 only indicate where it differs from impacts under alternative 2.
8. Tables from previous sections of the document should only be repeated in this chapter if absolutely necessary in characterizing impacts.

Tables 12-4 and 12-5:

Tanner crab data as presented here are incorrect as they appear to include Westward region total data (i.e., including the GOA) and should be refined to ensure that only BSAI data are presented.

Section 12.7 Alternative 1:

The text leads to an inaccurate representation of the simulation results under alternative 1.

Recommend to add:

“The current OFL does not constrain the current *status quo* harvest strategy. In the absence of the *status quo* harvest strategy whereby fishing could occur at the level of the current OFL then simulation results would indicate...” for (BBRKC and Tanner)...reference back to those specific sections by species (add section references by species here)

Alt 2/3 economic impact analysis:

F_{40} should be deleted from the tables and discussion as this is not an alternative proxy OFL.

There is a need to repeat the short-term projections in this section so that for each future year the catch is equal to that from the State harvest control unless this is greater than the yield under the $F_{35\%}$ control rule when the catch would be set to that corresponding to the $F_{35\%}$ control rule. This would better approximate the impact of a $F_{35\%}$ OFL rule than a comparison of the trajectories of catch based on setting State harvest rule and the $F_{35\%}$ control rule. All tables in this section need to be updated, ideally before the June Council meeting.

A table should be included that lists the OFLs for each stock for 2006 (only). Such a table would be similar to Table 2-1, but would include the OFL, the information used to compute it (Tier level, average catch, value of α , etc.) as well as the 2006 TAC (or GHL), and OFL.

12.8.6.1 Option 1 or Option 2:

This section should be moved to Chapter 2 so that all discussion of options 1 and 2 impacts are include in a single section. This section should also be revised so that the economic impact is the focus and additional information on economic impacts are included. For example, under option 1, market and pricing speculation could occur and lead to adverse economic impacts if the eventual TAC/GHL differed substantially from the OFL (e.g. if the assessment is revise downwards based on new information). This should be discussed further here regarding the market risks of setting an incorrect OFL. In situations where the stock may be increasing, establishing an OFL on the previous year's data could constrain yield. The industry would have some advance warning of a potential OFL increase under option 1. Under option 2 the time for forewarning of OFL is very short.

Section 12.8.6.2

There should be one section that compares the economic impacts of all of the alternatives. Care needs to be taken to avoid words (such as "significant") that have well-established policy meanings.

Section 12.9

The section will need to be rewritten in accordance with the earlier comments for Tier 6 impacts and the necessity of non-zero OFLs for some stocks where there is retained incidental catch in other fisheries.

Chapter 13

The CPT recommends that Section 13.2 (Bristol Bay Drilling) be deleted as its current inclusion under "reasonably foreseeable future actions" implies a potential impact on an equivalent basis to actions such as Amendment 80.

The meeting adjourned at 5:25pm

Appendix A

NPFMC Crab Plan Team meeting

May 22-24, 2007

AFSC Traynor Room, Seattle, WA

Draft Agenda

May 22

9:00 am -12:00 pm:

Administration

- Introductions,
- Additions to agenda and approval of agenda,
- Membership
- September meeting scheduling and location (Seattle or Anchorage)

Discussion of new Magnuson Stevens Reauthorization Act (MSRA) requirements

- Annual Catch Limits (ACLs) and Accountability Measures (AMs):
Implications for the Crab FMP (Stram/Harrington)

Review of draft Crab Overfishing Definitions Assessment

- CPT review new alternatives and options,
- CPT approval of draft document,
- Considerations for June council meeting,
- Public comments/questions

12:00 pm – 1:00 pm

Lunch break

1:00 pm - 5:00 pm:

Continue review of draft Crab Overfishing Definitions Assessment

May 23

9:00 am -12:00 pm:

Continue review of draft Crab Overfishing Definitions Assessment

12:00 – 1:00

Lunch break

1:00 pm - 5:00 pm:

~~**Review of 2006/07 BSAI Crab Fisheries:**~~

- ~~• Brief presentation on 2006/07 fisheries—ADF&G (Bowers),~~
- ~~• Review 2006/07 crab bycatch data—ADF&G (Pengilly/Bernard)~~

Trawl Surveys

- ~~NMFS Trawl survey overview from 2006 (Rugolo)~~
- ~~2007 BSFRF Bristol Bay RKC survey~~
 - ~~CPT discussion of reviewing and receiving survey results, data access, and any forthcoming NRC report (purpose and intent)~~

~~— Summer research plans/schedule~~

- ~~NOAA,~~
- ~~ADF&G,~~
- ~~BSFRF.~~

Aleutian Islands Fishery Ecosystem Plan

- ~~Brief presentation on draft plan (Bowers),~~
- ~~CPT comments on draft plan,~~
- ~~Public comments on draft plan.~~

May 24

9:00 am -12:00 pm:

Review of stock assessment models

- ~~CPT input on models prior to start of assessment cycle in August~~
- ~~Public input to assessment authors~~
- ~~Stock status projections~~

Review and approve guidelines for external stock assessment reviews

12:00 pm – 1:00 pm

Lunch break

1:00 pm - 5:00 pm:

Bering Sea Crab EFH Measures considered by Council

- Presentation on EBS snow crab motion for June Council meeting (Savikko),
- CPT comments on motion,
- Public comments on motion.

Discussion of SAFE and other reporting issues

Review of Crab Research Priorities

Other issues/new business

Adjourn - (5:00 pm)

Appendix B

Draft Guideline for Crab Assessments

Notification:

The appropriate time period for notification of intent to solicit an external stock assessment review would be in October. This would give the public the entire time period between May (when stock assessments are first reviewed by the CPT) and October (when TACs are announced) to determine if they had an issue with the stock assessment that they wished to have reviewed externally

Timing:

In order to alleviate possible complications with staff workloads, the appropriate time period for an external review (inclusive of any interactions with the stock assessment authors as well as any follow up workshop) would be from October-March. This would allow for the normal stock assessment, data analysis and TAC setting process to occur between April and October.

Ideally, the reviewer will work with Assessment Authors in a collegial setting where reviewers would make suggestions to the framework or information used in the assessment. If this procedure is adopted, the Assessment Author would work with the reviewer(s) to find a mutually acceptable time for a pre-assessment workshop.

Responsibilities of External Reviewers and Assessment Authors:

The pre-assessment workshop will allow the reviewer to discuss the stock assessment with the Assessment Author and make requests for model modifications or alternative use of information in the assessment. The External Reviewer should produce a written report of their recommendations. To the extent practicable, the Assessment Author will address the comments and suggestions documented in the External Reviewer's report in their SAFE document. In general it is assumed that the Assessment Author will be able to determine whether any changes in the stock assessment recommended by the External Reviewer are substantial enough to require review by the Plan Teams and SSC. Assessment Authors will have the professional discretion to decide when the External Reviewer's recommendations will be incorporated into the SAFE document. When the External Reviewer's recommendation involves a matter of professional discretion, such as the choice of statistical or computational methods, Assessment Authors will have the ability to decline to implement the recommendation. In addition, Assessment Authors may defer action on an External Reviewer's recommendation when complying with the recommendation would compromise the SAFE schedule. For example, if an External Reviewer made a request that would require extensive re-analysis of existing data that could not be accomplished prior to the Plan Team meeting, that request could be deferred to a subsequent year.

Anticipated results of an external review:

The CPT will receive both comments from the external reviewer (to the extent these are made available) as well as a report from the assessment author at the subsequent May CPT meeting indicating how comments by the external reviewer were addressed in the assessment.