


MEMORANDUM

TO: Council, SSC and AP Members

FROM: Chris Oliver   
Executive Director

DATE: September 29, 2005

SUBJECT: Crab Management

ESTIMATED TIME 1 HOUR
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**ACTION REQUIRED**

Review Crab Plan Team report and Crab Stock Assessment and Fishery Evaluation (SAFE) Report:

**BACKGROUND**

The Crab Plan Team met September 7-9, 2005 in Anchorage, Alaska, to review the status of stocks and to compile the annual Stock Assessment and Fishery Evaluation (SAFE) report. A partial Crab SAFE report was mailed to you September 20. The remaining chapters of the SAFE report will be made available at the Council meeting.

The SAFE report summarizes the current biological and economic status of fisheries, guideline harvest levels (GHL), and analytical information used for management decisions or changes in harvest strategies. The report is assembled by the Crab Plan Team with contributions from plan team members and other from the Alaska, Department of Fish and Game (ADF&G), and the National Marine Fisheries Service (NMFS).

The minutes of the Crab Plan Team meeting are attached as **Item D-3(1)**. A powerpoint presentation presented at the Crab Plan Team meeting on revisions to the crab overfishing definitions is attached as **Item D-3(2)**. The Crab Plan Team received a request from the Alaska Crab Coalition to review the eastern Bering Sea Tanner crab harvest strategy and Tanner Crab Rebuilding plan during the scheduled September plan team meeting. The letter of request is attached as **Item D-3(3)**. Formal comments by the plan team on this request are characterized in the plan team minutes.

Dr. Bob Otto, the chairman of the Crab Plan Team, will be available to present the status of stocks.

*Draft not yet approved by the Crab Plan Team members*

## **Crab Plan Team Report**

The Crab Plan Team convened their Fall meeting from September 7-9<sup>th</sup> at the Hilton Hotel in Anchorage, AK. Members present included the following:

**Bob Otto (NMFS/AFSC- Kodiak), Chair**  
**Forrest Bowers (ADF&G-Dutch Harbor), Vice Chair**  
**Diana Stram (NPFMC)**  
**Doug Pengilly (ADF&G-Kodiak)**  
**Wayne Donaldson(ADF&G-Kodiak)**  
**Jack Turnock (NMFS/AFSC-Seattle)**  
**Lou Rugolo (NMFS/AFSC-Kodiak)**  
**Joshua Greenberg (UAF)**  
**Shareef Siddeek (ADF&G-Juneau)**  
**Herman Savikko (ADF&G-Juneau)**

Glenn Merrill (NMFS-Juneau) participated for plan team member Gretchen Harrington.

Members of the public (and state and agency staff) present for all or part of the meeting included: Brent Paine, Leonard Herzog, Arni Thomson, Frank Kelty, Steve Hughes, Gerard Conan, Rob Rogers, Bill Widing, Ivan Vining (ADF&G), Kevin Kaldestad, Keith Colburn, Steve Grabach, John Boggs, Tom Casey, Einar Sorvik, Doug Woodby (ADF&G), Denby Lloyd (ADF&G), Jie Zheng (ADF&G), Bubba Cook (ADF&G) and Chris Oliver (NPFMC)

The agenda for the meeting is attached. There were no changes to the agenda.

**Information Quality Act.** Bubba Cook (NMFS-Juneau) provided an overview for the team on \*the guidelines from the Information Quality Act and how this relates to peer review responsibilities for the Crab Plan Team. He noted that the pertinent review for the Crab Plan Team would be those dealing with defined "influential scientific information" while "highly influential scientific information" would be determined prior to and peer reviewed outside of the Crab Plan Team Process. Bubba clarified that scientific information includes anything (but opinions and press releases) that are disseminated and thus while the Crab SAFE report is compiled by the Plan Team this does not exclude it from requirements under the IQA. Bubba noted that anything disseminated after June 16 2005 that is influential is subject to peer review bulletin and requirements.

Important considerations for the Crab Plan Team with respect to compliance with these guidelines include the following:

- Post biographical information on the Council website for all plan team members
- Sign conflict of interest statements for all plan team members
- Write up Peer Review Report according to guidance and post on Council website
- Consider nomination of "at-large" seat in addition to current plan team membership (Note: Council decision not plan team)

Bubba noted in response to questions regarding the conflict of interest concerns that if a member feels that they are in a conflict situation they should recuse themselves from that portion of the peer review. The plan team had an extended discussion of the small pool of available expertise

on crab stocks in the region and the potential for extensive conflict of interest depending upon the definition thereof. Bubba reiterated that OMB understands that in some cases they may be pulling reviewers from a narrow pool of scientists and that by nature some conflict is existing. OMB will plan to evaluate this on a on case by case basis. He noted that the clear conflict of interest involves a financial interest by profiting from the crab industry and participating in the fishery. The participation in the production of peer reviewed process is not anticipated to be a problem at present for this review.

The following guidance was given on the contents of the peer review report with a draft checklist provided to the plan team to assist them in meeting these requirements.

- Content of minutes can be adequate for the peer review report with additional information included as described in document provided
- Report should be posted on the Council website
- Public comments must be summarized and responded to.
- Disclaimer information should be listed on all reports included as determined to be influential

The team questioned the determination of influential and to whom does that determination apply. Bubba clarified that this determination is made by the Council and NMFS on an ad hoc basis throughout the year. He noted that publication in a peer-reviewed journal should be sufficient to meet guidelines. The team further discussed to what extent the SAFE report would be deemed influential information. Bubba reiterated that this was not a determination that needed to be made by the Plan Team but would rather be made by NMFS and the Council outside of the Plan Team process and the determination and charge for the CPT would be made clear to the team prior to reviewing documents for IQA requirements. It was further clarified that it is possible that some sections of the Crab SAFE report would be determined "influential" and requiring of peer review while others may not require this. The timing of this peer review is to be prior to dissemination to public.

The team had an extended discussion on the nature of what was to be reviewed specifically at this meeting. Review of the May 2005 minutes indicated that there were two items requested by Dr. Doug Demaster (e.g NMFS abundance estimates and the status of stocks in relation to overfishing levels). Discussion focused upon the two products from the Crab Plan Team being the stock status relative to overfishing and the constraints on harvest due to the overfishing rate. Members then noted that this information is given to ADF&G to determine TAC levels but there appears to be a problem regarding the apparent transparency of the process and to what extent the crab plan team is able to improve upon this.

Bob Otto noted that the team was awaiting formal guidance on what we were expected to peer review at this meeting. Frank Kelty questioned whether the TAC would need to peer reviewed as well and Bob replied that this was not yet determined.

The team was later provided with a formal letter of request from Chris Oliver, Executive Director of the Council requesting that the CPT review the NMFS abundance estimates and the status of stocks in relation to overfishing at this meeting in order to meet the peer review guidelines under the IQA (attached).

Chris Oliver provided the team an overview of the Council's plan to outline procedures for the SSC to be discussed in October in order to meet these requirements and for the to be the main peer review body. He noted, however, that the problem with the timing of crab information

review is due to the relative timing of the SSC meeting. Thus he was formally requesting that the CPT fill the function of the peer review body for the Agency this year according to the best information available in this regard. He noted that the SSC would rely on CPT input regardless of their formal peer review. This would represent an interim measure until such a time as the actual peer review body (CPT or SSC or otherwise) is clarified and determined. Bob Otto noted that the SSC is the more appropriate review body and there should be SSC oversight if not the entire review role. Chris noted that the plan team as well as the SSC should likely constitute the peer review.

**State/Federal Action Plan:** The team reviewed the state federal action plan following discussion and review of this at their May CPT meeting. The Council recommended that the discussion of the role of the Crab Plan Team be reviewed at the December Inter-Agency Research meeting. The Crab Plan Team feels strongly that this is not the appropriate venue for that discussion. The team would like direction on this from the NMFS Alaska regional director and the Commissioner of Fish and Game on what the relative role of the plan team is. It was also noted by Council staff that as a Council created body it is the purview of the Council as to what role the Council wishes its plan team to take.

Discussion focused on to what extent the State/Federal Action plan should even establish the role of the Crab Plan Team. It was suggested that perhaps the appropriate thing to do would be to delete this from the action plan and allow the Council only to define the roll of the plan team. Bob Otto felt that the determination of the plan team's role should be made on higher level and communicated to and approved by the Council and expressed to CPT to incorporate into their existing TORs.

The team felt that the Action Plan should be re-written to establish how the agencies work together to manage the fishery and the Action Plan should not deal with the function of the CPT. Guidance for how the CPT function should come from Council which should incorporate guidance expressed by the State, NMFS/AFSC and NMFS/AK region. The Council needs to discuss the role of CPT with both agencies and incorporate public comment on peer review. The team further desires clarification as to whether the action plan is part of the FMP or merely referenced in it.

The team continued with a discussion of role of CPT and why this team in particular (unlike other Council plan teams) struggles with their role. Lou Rugolo suggested that the plan team is perhaps not the appropriate technical group for review of crab issues and possibly consideration should be given to other options for defining who is the appropriate technical group and/or more appropriate review body.

Denby Lloyd informed the team that it is the intention of the State and NMFS to amend and review the Action Plan and contact will be made with the appropriate bodies for doing so. He noted that comments from the plan team will be incorporated as much as possible. The team agreed that the respective agencies will provide guidance in their revisions to the plan and this will likewise provide guidance to the Council.

## **Summer Research Issues**

### *Review of NMFS Survey*

Lou Rugolo provided tables of survey abundance estimates from the 2005 EBS trawl survey. Bob Otto discussed the overview of the survey, noting the incorporation of 25 stations to north.

He explained that there were appreciable numbers of female opilio in that area. It is not yet determined whether or not this area will be included as a permanent part of the survey. He also noted that in accordance with the industry survey the NMFS survey included 4 stations to far north. The survey utilized the same vessels, methodology and net mensuration protocols. The timing of survey was roughly same as 2004. In general, water temperatures at stations appeared warmer than last year, noting that spring was later in arriving this year thus some colder patches were present.

Lou Rugolo provided an overview that the tables handed out represented the same sets of text files given each year with the standard area-swept estimates. He commented that the survey results this year were straightforward and that there were no hot spots (tows with unusually high catches that trigger resampling protocols) encountered this year..

Bob Otto provided further overview of specific species-related survey results. Again no pre-recruits of blue king crab were found. For bairdi, more pre-recruits in were found in the area to the east (representing a change from previous years near Pribilof area). Survey results showed fair recruitment to the adult stock for bairdi.

A member of the public asked about the possibility of an experimental fishery for red king crab or the possibility for harvesting Pribilof red king crab. Two members of the public requested (and were granted by the chair) the ability to take up new issues out of order due to scheduling constraints.

The team discussed Pribilof red king crab management and current modeling efforts. Bob Otto provided an overview of information relevant to the Pribilof red king crab stock for management in order to discuss status of stock and to respond to the public comments on the issue. Doug Pengilly provided further management background on the reasons behind the fishery closure, both due to the fact that 1) following the first year of fishing effort the fishery never performed up to the expectations as well as the uncertainty in abundance estimates and 2) concerns regarding the status of the Pribilof blue king crab stock and related bycatch in the red king crab fishery. A pot survey is planned for the fall for the red king crab stock. Forrest Bowers noted that cost recovery fishing was attempted in 2003, but that fishery caught less than 2000lbs due to the fact that they could not find any red king crab. Bob Otto noted the concerns for bycatch of blue king crab still exist.

Leonard commented that he understand the problem with the separation of stocks but that skippers targeted red king crab separately from blue king crab in the past and the feeling is that under rationalization the fishery would be able to better minimize the impact on blue king crab. Thus the fishermen want to know the status of the red king crab stock in the Pribilofs. If the plan team and scientists believe there is a harvestable surplus, he believes they could have a small fishery under 100% observer coverage with rationalization. If the stock status shows that status is increasing and there would be a surplus, then the fishermen would like to have the ability to harvest this. He requested the possibility of a test fishery. He requested that if the team felt that there was a harvestable surplus then could the team make a recommendation to the BOF or the State to review the harvest strategy for Pribilof red king crab.

Forrest Bowers explained that the State has taken some of action by initiating the forthcoming pot survey whose purpose is to better define the status of both the red and blue king crab stocks and the potential for a red king crab fishery with minimal impact on the blue king crab stock.

## **Update on Snow Crab Tagging Charter**

Doug Pengilly reviewed the current status and preliminary results from the 2005 tagging study on snow crabs. He explained the background of the study in the apparent mismatch between the survey and the fishery, and the overall objective of the study to determine the recovery rate as a function of release location. Questions the study is intended to answer include: What is the probability of being caught based on location during survey? How far are crabs moving? Where are crabs from? Is the survey missing crabs or are crabs moving long distances over that time period?

Forrest Bowers noted that there is a greater potential this year than in the past to correlate the survey with the fishery as the fishery could begin closer to the summer survey (i.e. in October rather than on January 15). There are no results yet from this study but it is anticipated that many crabs will be recovered during the upcoming fishery.

## **Bering Sea Fishery Research Foundation Survey**

Steve Hughes (NRC) provided the team an overview presentation and document on the Bering Sea Fishery Research Foundation survey in the summer 2005. The survey had three primary objectives:

- 1- Analysis of the northern extension of NMFS survey area
- 2- Pilot Survey of Bristol Bay Red King Crab
- 3- Mini survey of Opilio crab

Where possible results were compared with the NMFS survey results. The survey looked at alternative survey methodologies which might provide an improvement on current survey methodology.

Some survey results by the foundation suggested that there are problems with assigning a catchability of 1.0 to opilio crab as the actual catchability appears to be much lower than that. Their estimated catchability from the survey (for NMFS) would be 0.15 for some size-sex classes based on their calculations.

The team discussed the differences in timing and areas between the NMFS and BSFRF surveys and noted that side by side towing would be necessary to make catchability estimates.

Tom Casey asked how much greater the estimate of abundance from this survey was in comparison to NMFS for opilio crab. Steve Hughes answered that that comparison could not be made as the opilio in this study were not completely whole haul sampled. The only conclusion from the opilio work that could be drawn is that the gear worked on the bottom and that 5-6 minute tows were the maximum for a fully loaded trawl.

Leonard Herzog asked what the results indicate in terms of a harvest strategy. Gerard Conan answered that overfishing levels defined in terms of historical situations are not meaningful and instead should be based on instantaneous estimates of population. He felt that MSY was an incorrect management strategy for snow crab

Bob Otto noted that this is a problem when the MSA defines MSY as a reference point. What should we do about density dependant effects? It appears to be counter productive to maintain a higher population of spawners. We do not know what portion of the stock is being harvested.

Catch rates in fishery useful only if covering the entire stock otherwise that gives only indication of the concentration of stock not stock status.

## **Model and Assessment Results**

### *Golden King Crab:*

Siddeek Shareef presented results from his Golden King Crab catch-length-analysis model. He noted that there are different dynamics for the eastern and western populations of the stock (east and west of 174) and different growth patterns in eastern and western stocks. These support the separate management of the two stocks.

Jack Turnock asked about the availability of pot survey data and to what extent they will be included in the model. Siddeek has not yet incorporated the pot survey data and is going to incorporate them as the model is being further developed. He was unsure to what extent it would support the increase in abundance he has estimated. Discussion ensued of the reliability of the fishery CPUE and the model fit to the fishery CPUE for trends in abundance. Siddeek noted that there are problems with observer sampling but that he is also using commercial catch and effort data to balance the model fit. Due to uncertainty in shell-aging he did not use the shell-age recorded by observers in the current model.

Suggestions from the team included the use of fish ticket data. Concerns were expressed regarding the spotty observer data on shell aging and to what extent the impact of reduced observer coverage will be for adequate data collection in this fishery. Siddeek commented that the observer data is particularly useful as all crabs are measured where the commercial data contains information mostly on retained crabs.

Arni Thomson inquired as to the correlation between the triennial pot survey and the observer data. Siddeek commented that he is not yet using that data but will be able to use the 1997, 2001, and 2003 pot survey data in the near future as the model is being expanded. He explained that Bowers ridge is treated as part of the western area in the model.

Tom Casey questioned the indications of variable recruitment and the potential impacts on the harvest policy. The team discussed the current data and the model projections, noting that there is less confidence in the most recent projections and that next year this will be recalculated.

### *Red King Crab Model:*

Jie Zheng presented an overview of his Bristol Bay red king crab model. The model uses catch data, trawl survey data and tagging study data. He provided an overview of the population decline in the 1980s and the various theories which account for this decline (e.g., fishing alone, fishing plus a high natural mortality rate)

Trawl bycatch overview: observed bycatch low compared to abundance but problems centered on unobserved bycatch (e.g., the "red bag issue") and possible unobserved habitat damage

The team discussed the theories presented in the from Dew and McConnaughey paper. Tom Casey commented that there should be a discussion regarding rebuilding this stock and what the actual distribution needs to be to be considered rebuilt. He noted that the population near Unimak is questionable as being a part of the normal distribution and asked for clarification on to what extent that is the normal distribution pattern for this stock. The team discussed the normal

distribution of the stock relative to bottom temperatures and whether not the shift in distribution is a result of trawling as expressed by the paper.

Jie Zheng noted that populations in decline tend to retreat to optimal areas for their habitat as opposed to populations when they are increasing and have a wider range of habitat regions. He felt that more work was necessary on the hypothesis brought forward by Dew and McConnaughy, noting that the distribution started to shift in 1977 and a large majority of the females were far from Unimak and Amak since 1978. Therefore the spatial overlap between trawling and the crab distribution in early 80s is not explicit and more work is called for to understand the potential for the "red bag" issue.

Discussion focused upon the consideration of high natural mortality as a probably cause and the possible additive natural mortality due to bycatch mortality (ie not necessarily "natural" but could have been attributed to bycatch mortality). Jack Turnock suggested that there is no evidence of higher natural mortality ( e.g. from disease etc) and that there are no observations or evidence other than modeling approaches for high natural mortality. The team discussed theories on why mortality might have been so high: disease, senescence, groundfish predation. The team noted that all of these theories have problems with respect to observations or data collection from that period which are lacking on order to prove absolutely any of them.

The team discussed the length-based model analysis overview. Discussion focused on what is included in the mortality calculations and how different mortality periods are defined, noting that better model fits are seen when multiple time periods for mortality are defined.

A discussion of the retrospective analysis and the comparisons against some groundfish assessments ensued. Jack Turnock expressed that the current analysis makes an inappropriate comparison with groundfish models given the methodology for the retrospective analysis being performed. The team suggests incorporating a diagram of observed versus predicted for the retrospective analysis.

There was public comment that snow crab estimates are consistently underestimating mature biomass of snow crab in recent years while for red king crab model behavior shows a closer fit each year. Jack Turnock commented that he remains concerned with overparametrization of the model, as it is always possible to get closer fits to data with more parameters but also important to estimating trends in abundance estimates and to fit the model to the trend. In some years, looking at only a couple years you would not have closer estimates to the survey data.

The team discussed the use of the mortality estimate in the model and that there were inconsistencies with other mortality estimates for red king crab.

The public asked repeated questions regarding the available of stock status information at this meeting and expressed frustration that despite the abundance estimate being available that no indication of the status of stocks was being offered. Doug Woodby explained that from the State's perspective it would be inappropriate for representative of the State to provide information pertaining to the establishment of TACs at the meeting. He noted that TAC recommendations are made to the Commissioner of Fish and Game not to the CPT and that as yet no meetings have occurred to determine the TACs and no recommendations have been made to the commissioner. He explained that the Crab Plan Team should be reviewing the status of stocks in relation to overfishing and that this would then set the upper bound below which the state could establish TACs.



### *Snow Crab Model*

Jack Turnock presented results from and highlighted changes to the snow crab model. Jack noted that stock recruitment curve estimates are based on model output and that the Bmsy in the FMP is not applicable to the model output. It is therefore estimated based on parameters in model and stock-recruitment curve, or estimated (different approach) using an SPR analysis (as per groundfish reference points). Plan team discussion ensued on the estimated fishing mortality. Jack clarified that the modeled mortality includes directed fishing as well as other sources (e.g., bycatch mortality) and is intended to represent all mortality. A scenario was presented of evaluating the current progress towards rebuilding the stock under the current rebuilding plan and projections under various harvest strategies.

Plan team members questioned the main reason behind the different biomass estimates from last year versus this year and to what effect they are a result of new data, or structural changes to the model or other impacts. The author noted that it may be due to estimating survey selectivities in the new model and the resultant better fit to data with that. He also noted that the most recent survey estimates is higher thus the model is estimating higher on previous years.

Questions were raised regarding the scenarios of handling mortality in directed crab fisheries. Reference was made to the Warrenchuck and Shirley study and the possible use of their percentages for handling mortality in snow crab. Bob Otto also noted some recent Canadian studies snow crab for additional information on the appropriate handling mortality estimate. A discussion of mortality by gear type and fishery is also updated annually in the Crab SAFE chapter on BSAI crab bycatch. A range of handling mortality was considered in the model (0-100). The team suggested the use of 25% for comparison with model results.

Lou Rugolo noted that 50% is consistent with what the working group has decided to use for handling mortality in their work on revising the overfishing definitions. The team discussed the inherent limitations in estimating handling mortality.

A member of the public disagreed with estimates of 50% mortality based on experience and observed deadloss. He felt that it would be unfair to include that in estimates and have that influence results. Other members of the public requested clarification on to what extent the opilio tag studies might give a better indication of handling mortality? Doug Pengilly clarified that while they have looked at this in some king crab studies it is not currently included as part of this new tagging study.

Gerard Conan noted that he was concerned with fitting multiple parameters and the ability to have several different solutions. He expressed his concerns with the model selectivity and estimates of catchability by trawl as he felt that this doesn't comport with his understanding of crab behavior and the industry-sponsored survey results. Steve Hughes noted that there are many differences from the previous model and requested clarification as to when the SSC will review this? He feels that SSC review would be critical given the anticipation that this model will be increasingly important in management. Jack felt that the model would likely be reviewed by the SSC in the spring of 2006.

### **Status of Stocks**

Bob Otto reviewed the status of stocks in relation to overfishing. Snow crab showed recruitment events affecting females more than males (assuming that a real event being observed). He noted that there were indications of this last year this year there is greater confidence in evidence of recruitment. It may represent possible immigration to area from new stations observed. This represents the second year in a row that an increase was observed from 2001 in this area. Some

consideration should be given to the boundary of the survey area if the distribution of population has changed.

Tom Casey asked whether all clutches were fertilized. Bob answered that we do not have data on that yet. The model assumes that all are fertilized but at present there is no data on to what extent they are not fertilized in reality.

The team discussed the distribution of larvae and the larval drift/single population complications. The relative distribution of the population was discussed. Lou Rugolo showed some temperature plots from the survey, indicating slightly colder waters but very difficult to judge the net effect. The team discussed the relative merits of permanently extending the survey line and if that were done how comparisons would be made with previous years data. Bob noted concerns with the movement of the front relative to crab distribution and that it doesn't take a large change in the thermocline to move the location of front. Doug Pengilly asked about station K24 given that it had very high catches last year. Bob and Lou replied that they had not yet looked at that data. Doug noted that the estimate of TMB was different from the results of Jack's model.

The public requested clarification on the difference between the survey abundance estimate and the stock assessment results and which is used to establish the status of stocks and the TAC. The team discussed the differences between the survey estimates and Jack's model. Bob noted that one large difference may be in the estimates of male maturity. Jack noted that he does not include the northern stations in his model. Bob clarified that the northern stations are not included in the status of stocks relative to overfishing either.

Steve Hughes expressed concerns that the estimates of TMB numbers are substantially different between the model and the survey with the model much less than what is estimated from the survey abundance.

Forrest Bowers noted that the harvest strategy is dependant on the mature males not legal males. Bob mentioned that there were indications that the population size of males 4-inches or greater in carapace width was stable.

The public expressed frustration that there was no estimate of population size provided from the survey.

*Note additional information and discussion on this agenda item is contained in the Peer Review Report*

## **Stock Assessment Fishery Evaluation Report:**

### *Economic SAFE*

Josh Greenberg provided an overview of information to be included in the Economic Chapter of the SAFE report. He noted that while this year's chapter will simply update the information from last year, in the following year after implementation of crab rationalization more information will be available for inclusion.

Glenn Merrill provided an overview of the availability of economic data from the Crab Rationalization program. May 1<sup>st</sup> 2006 represents the first set of new data on the first year of operation under crab rationalization. Several months before May 1<sup>st</sup> there will also be additional data available from the Pacific States Marine Fisheries Commission.

Josh Greenberg provided a summary of an on-going NPRB-funded project on a market model of Alaska and Canadian snow crab and king crab. He noted the emergence of Canada in world crab landings in recent years. The intent of this market analysis development is to eventually compare results with the post-rationalization information in order to evaluate results. The team requested that Josh include this project summary in the SAFE report for this year.

Tom Casey questioned whether the model could predict how far Canadian production must fall for the Alaskan price to go back to \$1.85/lb (from current level of \$1.30/lb). Josh answered that while the model framework could be eventually used to answer that, it is too preliminary to give any results at this point.

Josh also noted the current problem with NMFS discontinuing the collection of cold storage holdings. He requested that the CPT submit a letter to NMFS (similar to SSC request) to re-start collection of cold storage holdings.

In response to this request, the Crab Plan Team took the following motion (agreed unanimously):

**The Crab Plan Team agreed to submit a letter to NMFS in support of reinstating collection of cold storage data.**

The team and the public had further discussion and agreement on the importance of these data and the need for recollection.

*Discussion of future SAFE Reports:*

The team discussed what additional items should be included in the SAFE report. The team noted that additional economic information will be available for discussion at the May 2006 meeting. Josh requested that the team discuss what the role of the CPT is with respect to economic information dissemination and analysis. Some suggestions from team members included: an overview of current economic conditions, finances and where money goes, how this is of benefit to the nation.

**Discussion of Bering Sea Tanner crab harvest strategy and rebuilding plan**

Arni Thomson spoke on behalf of a letter submitted to the CPT regarding a request to revisit the Bairdi harvest strategy under the existing rebuilding plan. Understanding that the process for revising a harvest strategy can take several years, the ACC is requesting feedback from the plan team on their opinion of the current harvest strategy and to what extent the stock status may warrant a review of this harvest strategy. The letter specifically noted changes occurring in stock recovery, moving into rationalized fishery and dramatically reducing bycatch impacts.

Wayne Donaldson requested additional information from NMFS on how the current survey and population tracking compared with previous years. Discussion ensued on the continuing upward trend in the stock nearing MSST. In recent years more bairdi have been located in the western portion of survey. The stock is possibly split approximately 50/50 east and west. New shells and pre-recruits were predominant with the same relative increase in both as mirrored in the overall biomass trend.

Jie Zheng showed a graph of survey abundance over time east and west of 166. The females in recent years both east and west trend upwards, with the west recently trending higher than east.

The team discussed the harvest strategy. Doug Pengilly provided an overview of the existing strategy. There is no constraint on opening the fishery this fall. This year represents the first year that more than 21 million lbs of mature female biomass was estimated. Therefore according to the rebuilding plan the fishery could be opened, but with the TAC computed at half the normally computed value. Thus there could be a constraint on fishing in the area east of 166° W longitude due to the 4 million lb minimum TAC for that region. Wayne further noted that there is no minimum TAC for the area west of 166° W longitude.

The BOF received an agenda change request for their fall work session and if approved this could be addressed by the BOF at some time this year.

The team discussed the patchiness in distribution of females in the surveys and the concentration by shell ages, prevalence of some smaller mature females in patches, and the notion that depth also plays into patchiness of distribution.

Jack suggested that the team should review the Tanner crab model and rebuilding strategies at May meeting. The review should consider model approaches that could or should be done differently and possible changes such as terminal molt for bairdi might need to be and discard and natural mortality in the model. If we are looking at reopening fishery we ought to reexamine model and look at rebuilding trajectories.

Bob concurred that the team should examine the model and consideration should be given to extensively redoing that model.

The team agreed to add an agenda item to the May 2006 meeting to discuss updating the model and additional modeling strategies for Tanner crab.

Glenn Merrill reminded the team of the final action by the Council in October on the Tanner crab quota share split between east and west of 166° W longitude.

The team discussed to what extent a fishery can occur concurrently east and west and what would happen if one area closed. Wayne clarified that the State has the ability to close areas within larger management areas and that harvests by area are feasible to track inseason via electronic reports. It would be possible to open the western area and keep the eastern area closed.

Concerns were expressed regarding the vagaries of language in regulations on management of the western area subject to "sustainability" of management etc. Doug Pengilly noted the extensive issues involved in revisions to Tanner crab regulations and that anything other than dissolving the minimum TAC for the eastern stock involves extensive CPT discussion, plan amendment analyses, and analyses for changes in State regulations. Changing anything but minimum TAC will be multi-year process. The team noted the need to consider the status of the revisions to the overfishing definitions as well as the assessment model. A plan amendment requires activity and coordination by both the Council and BOF. The next regularly scheduled BOF King and Tanner crab meeting would be 2008. The team discussed the potential for a 3 year process to make changes to this rebuilding plan.

Frank Kelty noted that when the opilio rebuilding plan was initiated it raised concerns regarding economic implications but this was not the case when the Tanner crab plan was put into place due to flourishing fisheries for king crab and snow crab. Now the economic situation has altered and fishermen need the economic revenue from the fishery. The guidelines should be looked at, and thresholds should be reevaluated as changes have occurred since this was established.

Josh Greenberg noted the importance of considering the economic analysis and impact, particularly of the change in size limits and its impact on economics of fishery.

Diana Stram agreed to check into the possibility of a very simplified analysis to framework harvest strategy and turn to BOF. This would still have to be plan amendment but might represent a more streamlines analysis. It is also important to consider the upcoming guidance on revisions to National Standard 1 guidelines.

## **Overfishing Definitions Update**

Siddeek Shareef provided an overview of many unresolved issues that are complicating continued work on revisions of the overfishing definitions by the inter-agency workgroup (attached). Members of the working group present also commented on these issues and the difficulties faced by the group in moving forward.

Jack Turnock explained that the manner in which these issues are defined has a radical impact on the results. He noted that the workgroup is at an impasse as they cannot come up with scenarios as a group for how to address these because of different results obtained from different ways of pursuing these issues. Lou Rugolo reiterated that these twelve unresolved issues are essential to completing the analysis. The workgroup has found that it does not have consensus agreement on essential aspects of the analysis (model inputs, outputs or frameworks).

Suggestions from the team included the use of independent models and to look at various modeling outputs to see how the results vary. Further discussion suggested to look at the distribution of modeling results and see if there are solutions that converge on reference points. The use of sensitivity analysis was encouraged for deciding upon the correct approach. Jack Turnock noted the workgroup's plans for reviews outside of the CPT or SSC and discussed some ideas for outside reviews include CIE, and an outside panel of experts. Siddeek noted that, as a first step, the CPT having expert members on BSAI crab fisheries could help in resolving many of these issues.

The team noted that an entire plan team meeting could be focused on this alone with the team reviewing this and commenting and providing feedback on every aspect of these unresolved issues. The differences lie both in data availability and philosophical issues. Lou gave an overview of 9 reproductive parameterization issues that they are already having to simplify and which are causing more risk-prone reference point by virtue of not having sufficient parameterization and/or data availability to more specifically define. He discussed the problems with the nature of gross-oversimplification necessary in modeling context. He felt that we are guided by NSG1 to be explicitly risk-averse and now feels as though they are faced with a dichotomy of viewpoints on a case by case basis regarding how to address these remaining issues.

CPT had a discussion on how to approach even one of these issues: e.g., measure of spawning biomass. The team recommended to use both approaches and choose the best option. Jack provided an overview of some modeling results which exemplify some of the dilemmas faced by the work group on this and other issues. Questions from team members regarding to what extent mating ratios being used are sufficient to characterize variability and number of females in the population. Can these accurately capture the spatial variability involved.

The team struggled with providing advice to the workgroup on these issues as this was the first time the CPT had been alerted to the occurrence of fundamental issues faced by the workgroup.

There was insufficient time to review any of the issues in detail. The team suggested attaching these slides to the minutes and to solicit feedback from the SSC as well. CPT members should look at the slides and write up brief comments on why each approach should be used. If at all possible based on the slides and information presented then CPT members should provide advice and information to the workgroup. Comments should be submitted to the working group one month from now.

The team felt that it would be beneficial to use the plan team as a sounding board and have these issues presented individually to the team and see what the team recommends. The team discussed the suggestion for an additional plan team meeting to review issues and provide guidance to WG on some of these problems in greater depth and with more information presented to the team. The team discussed the utility of a short one day meeting to provide guidance to the work group on dealing with these issues. The workgroup appears to be at an impasse as to how to proceed and would therefore have difficulty in meeting the December 31<sup>st</sup> deadline for working group draft.

The team noted some frustration that this represents the first time the CPT actually had any opportunity to comment on what the problems and hang-ups are on the analysis. The team could not reach consensus on the ability to schedule an ad hoc plan team meeting to review these issues. The team further discussed the idea of having the workgroup draft reflect the diverse opinions, ramifications and justifications on these decision points.

Jack Turnock will present to the SSC at the October Council meeting to provide review of progress. The CPT requests guidance from the SSC on how the plan team should proceed in providing advice to the work group as well as how the work group should proceed in moving forward with their analysis.

## **Issues and Timing**

### *Membership issues:*

The team recommends that Ginny Eckert of UAS be contacted for possible membership on the CPT. The team discussed the overall need to expand expertise on the team outside of state and agency personnel. Some additional suggestions for more members included Jim Tagart from USGS, Steve Jewett (UAF) and other possible crab researchers with academic expertise.

### *Timing and agenda issues for next meeting:*

The team agreed that a meeting is warranted to review and evaluate the work group progress when their draft report is available (if not before to provide additional guidance). A CPT meeting will occur sometime in January for this purpose (location and date TBD).

Other meetings for May and September and the respective agendas to be determined.

The meeting adjourned at 1:15PM, Friday September 9th.

NPFMC CRAB PLAN TEAM

DRAFT AGENDA

September 7th-9th,  
Hilton Hotel, Anchorage

<b>Wednesday Sept 7<sup>th</sup></b>		
09:00	<b>Introduction</b>	<ul style="list-style-type: none"> <li>Review and approve agenda</li> <li>Approve minutes from May meeting</li> </ul>
09:30	<b>Information Quality Act State/Federal Action Plan</b>	<ul style="list-style-type: none"> <li>Update on IQA</li> <li>CPT role in reviewing stock assessment products (under IQA)</li> <li>Additional review of state/federal action plan</li> </ul>
12:00	<b>Lunch</b>	
13:00	<b>Summer Research Issues</b>	<ul style="list-style-type: none"> <li>Review NMFS survey</li> <li>Review BSFRF survey</li> <li>Update on snow crab tagging charter</li> </ul>
15:00	<b>Break</b>	
15:15	<b>Model and assessment results</b>	<ul style="list-style-type: none"> <li>Golden King Crab</li> <li>Red King Crab</li> <li>Snow Crab</li> </ul>
<b>Thursday Sept 8<sup>th</sup></b>		
9:00	<b>Stock Assessment Fishery Evaluation report</b>	<ul style="list-style-type: none"> <li>Review status of stocks and stock status relative to overfishing and current harvest strategies</li> <li>IQA review (pending clarification) on status of stocks and stock assessment products</li> <li>State annual management reports</li> <li>Economic section of SAFE</li> <li>Review and revise Executive Summary and Compile SAFE</li> <li>Discussion of contents of future SAFE reports</li> </ul>
12:00	<b>Lunch</b>	
13:00	<b>Stock Assessment Fishery Evaluation report</b>	<ul style="list-style-type: none"> <li>Continue SAFE report discussions</li> </ul>
<b>Friday Sept 9<sup>th</sup></b>		
09:00	<b>Overfishing Definitions</b>	<ul style="list-style-type: none"> <li>Review progress and provide guidance to work group</li> </ul>
11:00	<b>Bairdi Tanner crab harvest strategy and rebuilding plan</b>	<ul style="list-style-type: none"> <li>ACC request for CPT review</li> </ul>
12:00	<b>Lunch</b>	
13:00	<b>Issues and Timing for May 2006 meetings</b>	<ul style="list-style-type: none"> <li>Review membership issues, requests and scheduling requirements for additional CPT members</li> </ul>
14:00	<b>New Business</b>	

# CPT Overfishing Working Group

Crab Plan Team Presentation,  
September 2005

## Introduction

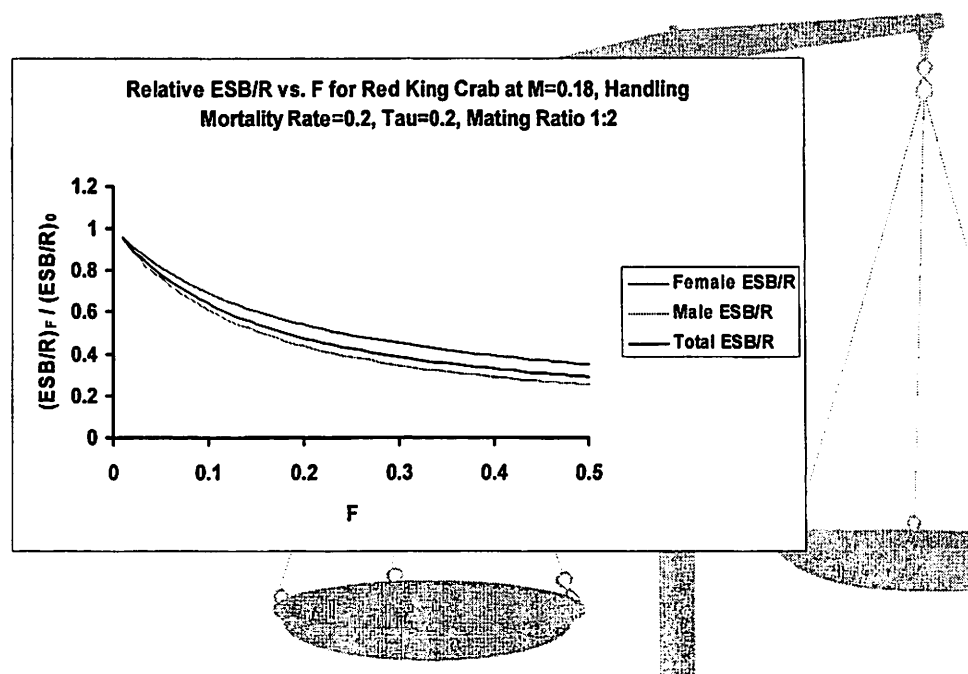
- Over the time period the CPT overfishing working group has progressed in defining the important input parameters and modeling approaches to determine limit and target reference points. This is a part of the major undertakings to revise the crab FMP.
- The models developed to address the issues should not be categorized as EXCEL, FORTRAN, and ADMB models. Those are just the vehicles to process the mathematical computations or parameter estimation in the simulation models. So, there are two types of simulation models followed by the working group, which are not redundant, but complementary.
- Recently the working group has confronted with different points of view on some of the input parameters and computation procedures. The subsequent slides list the issues and we seek your guidance to resolve them.

*Note: In the following slides the text in yellow are definitions of the issues or justifications for positions taken by members.*



# Crab Modeling Issues

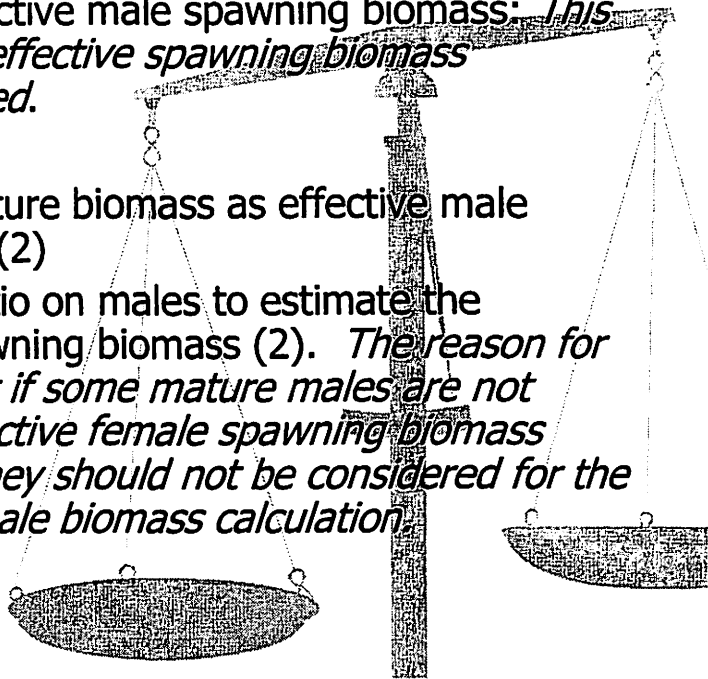
- A. Measure of spawning biomass: *This is the spawning biomass that will be considered for the stock-recruitment relationship*
- Total male and female effective mature biomass at time of mating (2).  
*Pros: more conservative; cons: primiparous and multiparous females mate at different times, a snow and Tanner crab male weighs much heavier than a female, and males are used twice for effective spawning biomass calculation.*
  - Fully mated female mature biomass at the hatching time (1). *Support: larvae come from these females, a better measure of larvae abundance. Mature males have been used to derive mated female mature biomass.*
  - Do both to explore the results and choose plausible one (1). *The reason for the positions taken by the two single votes is that the sensitivity of female effective spawning biomass per recruit (ESB/R) against fishing mortality behaves differently for different species. For example, in the September 05 CPT meeting, one working group member showed that the behavior of female ESB/R for snow crab was insensitive to low F values. On the other hand, it is sensitive or behave similarly to male or total ESB/R for red king crab (Figure in the next slide).*



## Crab Modeling Issues

B. Formulation of effective male spawning biomass: *This is required if total effective spawning biomass calculation is needed.*

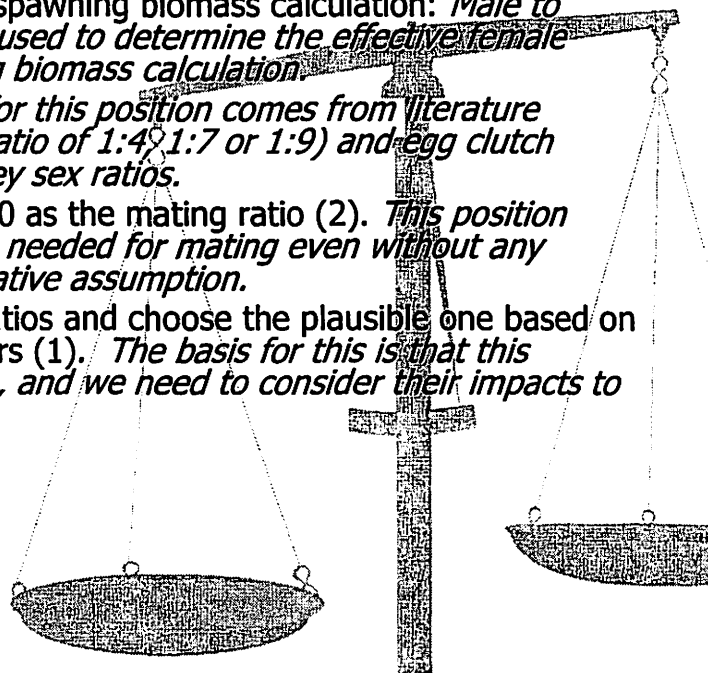
- Use total male mature biomass as effective male spawning biomass (2)
- Use the mating ratio on males to estimate the effective male spawning biomass (2). *The reason for this position is that if some mature males are not considered for effective female spawning biomass calculation, then they should not be considered for the effective mature male biomass calculation.*



## Crab Modeling Issues

C. Mating ratio in effective spawning biomass calculation: *Male to female mating ratio is used to determine the effective female spawners for spawning biomass calculation.*

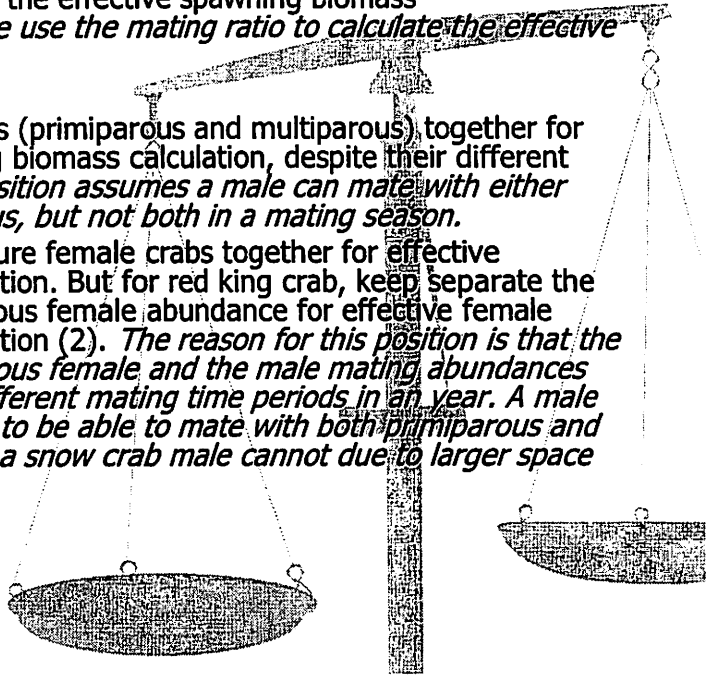
- Use 1:3 (1). *Support for this position comes from literature (many with a mating ratio of 1:4, 1:7 or 1:9) and egg clutch fullness data and survey sex ratios.*
- Use the sex ratio at  $F=0$  as the mating ratio (2). *This position assumes every male is needed for mating even without any fishing. It is a conservative assumption.*
- Run different mating ratios and choose the plausible one based on results and other factors (1). *The basis for this is that this parameter is uncertain, and we need to consider their impacts to the results.*



# Crab Modeling Issues

D. Application of mating ratio in the effective spawning biomass calculation: *How should we use the mating ratio to calculate the effective spawning biomass?*

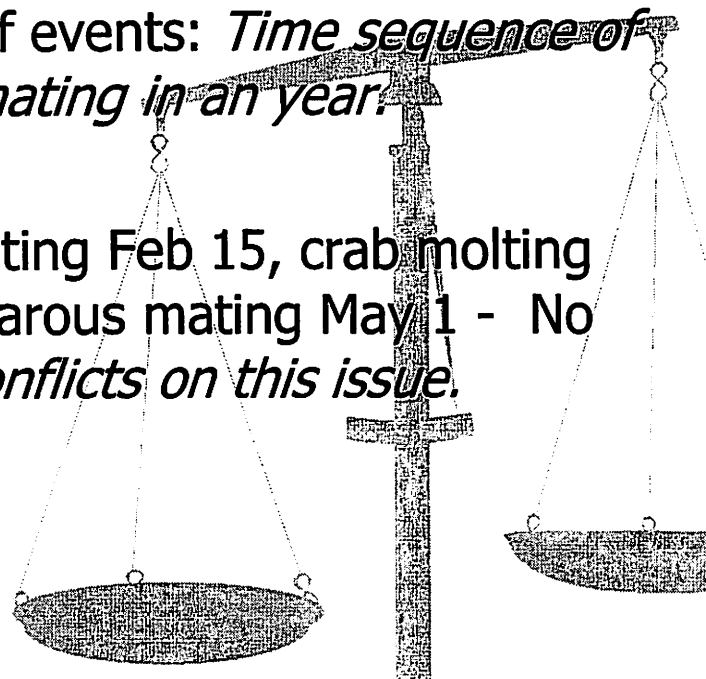
- Put all mature female crabs (primiparous and multiparous) together for effective female spawning biomass calculation, despite their different mating times (2). *This position assumes a male can mate with either primiparous or multiparous, but not both in a mating season.*
- For snow crab, put all mature female crabs together for effective spawning biomass calculation. But for red king crab, keep separate the primiparous and multiparous female abundance for effective female spawning biomass calculation (2). *The reason for this position is that the primiparous and multiparous female and the male mating abundances are calculated at quite different mating time periods in an year. A male red king crab is assumed to be able to mate with both primiparous and multiparous females, but a snow crab male cannot due to larger space separation.*



# Crab Modeling Issues

E. Time course of events: *Time sequence of molting and mating in an year?*

primiparous mating Feb 15, crab molting April 1, multiparous mating May 1 - No conflict. *No conflicts on this issue.*

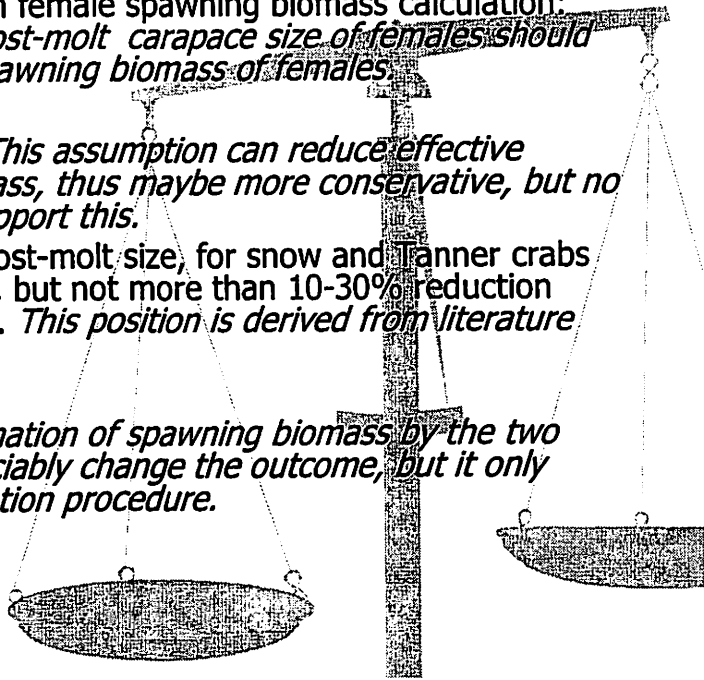


# Crab Modeling Issues

F. Pre- or post-molt size in female spawning biomass calculation:  
*Whether pre-molt or post-molt carapace size of females should be used to calculate spawning biomass of females.*

- Use pre-molt size (2). *This assumption can reduce effective female spawning biomass, thus maybe more conservative, but no data or literature to support this.*
- For all king crabs use post-molt size, for snow and Tanner crabs ok to use lower weight, but not more than 10-30% reduction from post-molt size (1). *This position is derived from literature and published data.*
- No decision (1).

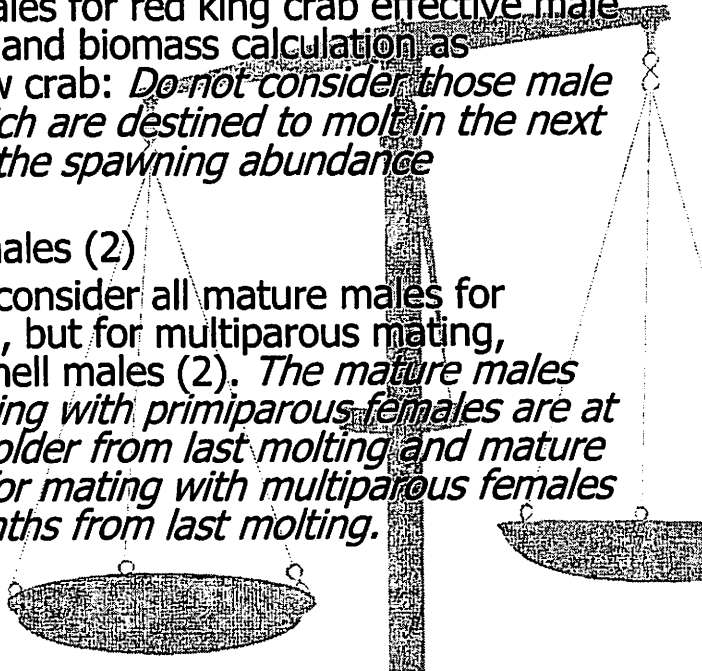
*For red king crab estimation of spawning biomass by the two methods do not appreciably change the outcome, but it only complicates the estimation procedure.*



# Crab Modeling Issues

G. Use non-molting males for red king crab effective male spawning numbers and biomass calculation as considered for snow crab: *Do not consider those male red king crabs, which are destined to molt in the next molting season, in the spawning abundance calculation.*

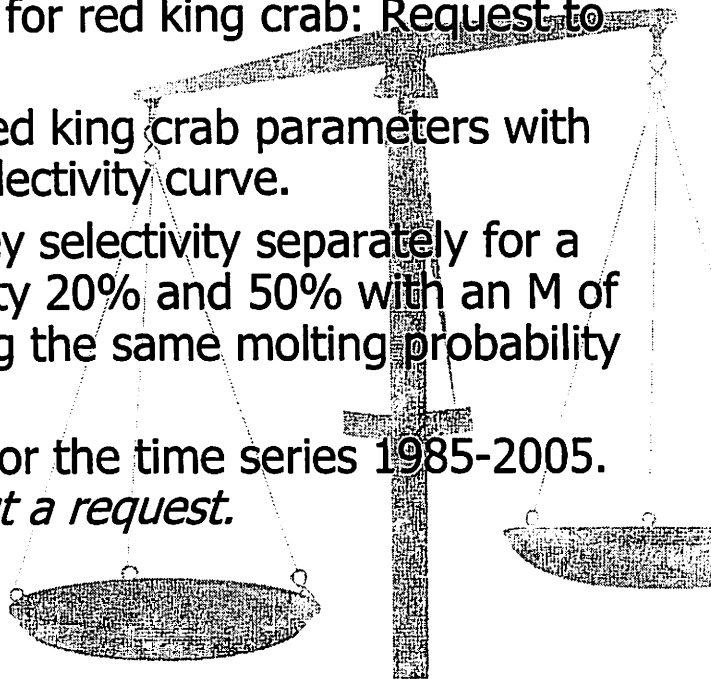
- Use non-molting males (2)
- For red king crab, consider all mature males for primiparous mating, but for multiparous mating, consider only old-shell males (2). *The mature males considered for mating with primiparous females are at least 10.5 months older from last molting and mature males considered for mating with multiparous females are at least 13 months from last molting.*



# Crab Modeling Issues

H. Survey selectivity for red king crab: Request to one member

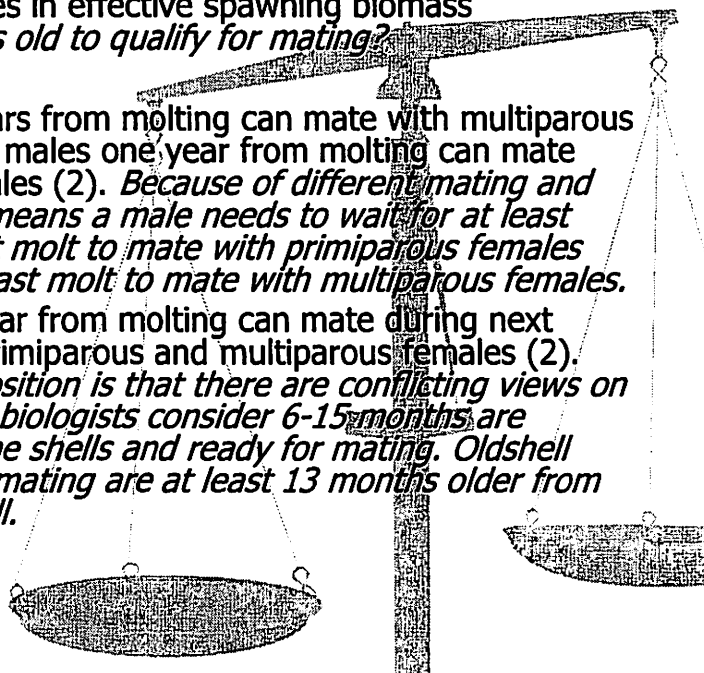
- (a) Estimate the red king crab parameters with the Weinberg selectivity curve.
- (b) Estimate survey selectivity separately for a handling mortality 20% and 50% with an M of 0.18 and keeping the same molting probability model.
- (c) Fit the model for the time series 1985-2005.  
*Not an issue, but a request.*



# Crab Modeling Issues

I. Shell condition of males in effective spawning biomass calculation: *How old is old to qualify for mating?*

- Old-shell males two years from molting can mate with multiparous females, and old-shell males one year from molting can mate with primiparous females (2). *Because of different mating and molting timings, this means a male needs to wait for at least 22.5 months from last molt to mate with primiparous females and 25 months from last molt to mate with multiparous females.*
- Old-shell males one year from molting can mate during next mating season with primiparous and multiparous females (2). *The reason for this position is that there are conflicting views on this issue. Some crab biologists consider 6-15 months are sufficient to harden the shells and ready for mating. Oldshell males considered for mating are at least 13 months older from last molting to oldshell.*

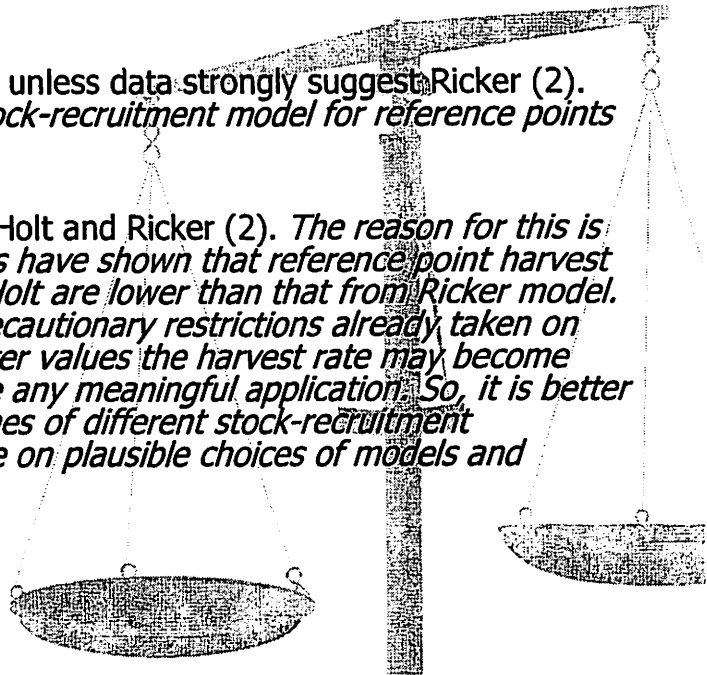


# Crab Modeling Issues

## J. S-R relationship:

Use Beverton-Holt model unless data strongly suggest Ricker (2).  
*Use a conservative stock-recruitment model for reference points estimation.*

- Look at both Beverton-Holt and Ricker (2). *The reason for this is that simulation studies have shown that reference point harvest rates from Beverton-Holt are lower than that from Ricker model. With a number of precautionary restrictions already taken on various input parameter values the harvest rate may become extremely low to have any meaningful application. So, it is better to explore the outcomes of different stock-recruitment relationships to decide on plausible choices of models and values.*

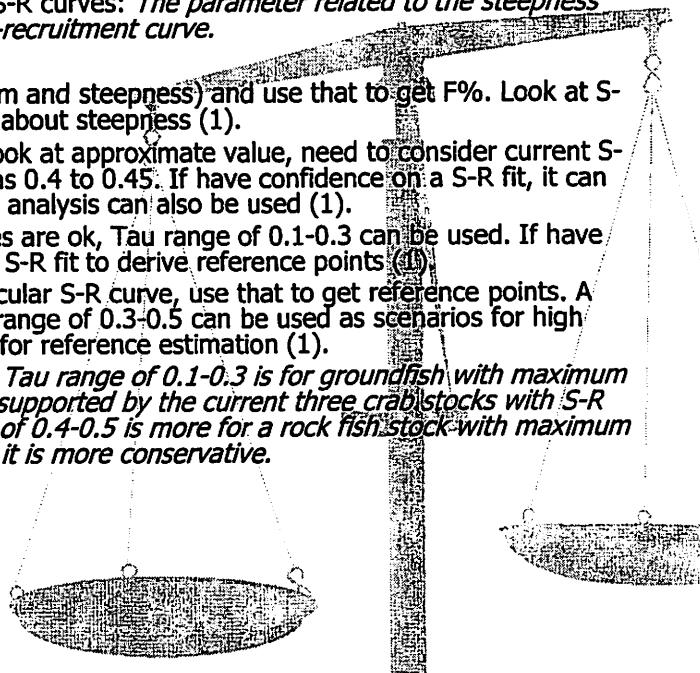


# Crab Modeling Issues

## K. Steepness parameter range for S-R curves: *The parameter related to the steepness near the origin of the stock-recruitment curve.*

- Decide on a particular S-R (form and steepness) and use that to get F%. Look at S-R data and make judgment about steepness (1).
- Clark's method is one tool to look at approximate value, need to consider current S-R data and steepness low as 0.4 to 0.45. If have confidence on a S-R fit, it can be used to derive F%. Meta analysis can also be used (1).
- Clark and Bayesian approaches are ok, Tau range of 0.1-0.3 can be used. If have confidence, use a particular S-R fit to derive reference points (1).
- If have confidence on a particular S-R curve, use that to get reference points. A tau range of 0.1-0.3 and a range of 0.3-0.5 can be used as scenarios for high and low productive periods for reference estimation (1).

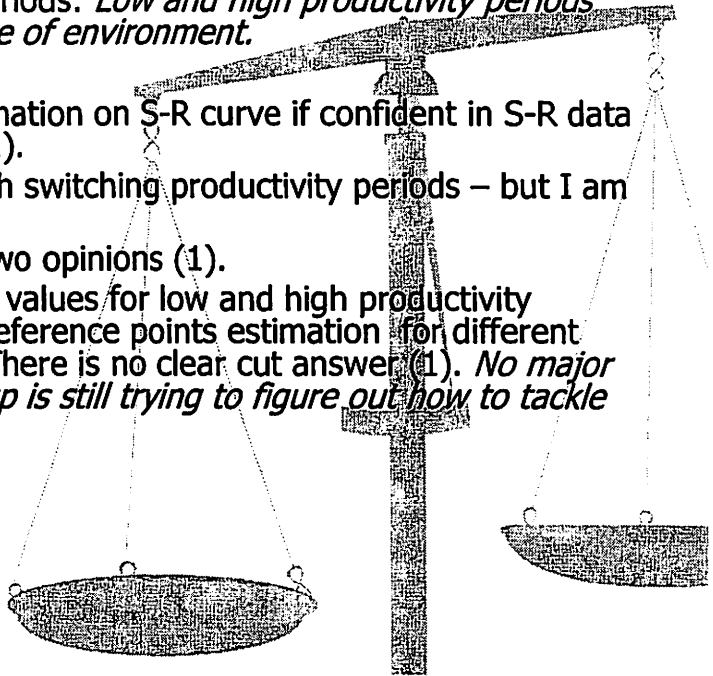
*Tau range is a major issue. Tau range of 0.1-0.3 is for groundfish with maximum ages of 20-30 years and is supported by the current three crab stocks with S-R data available. A tau range of 0.4-0.5 is more for a rock fish stock with maximum ages of over 40 years, but it is more conservative.*



# Crab Modeling Issues

## L. Change in productivity periods: *Low and high productivity periods due to different regime of environment.*

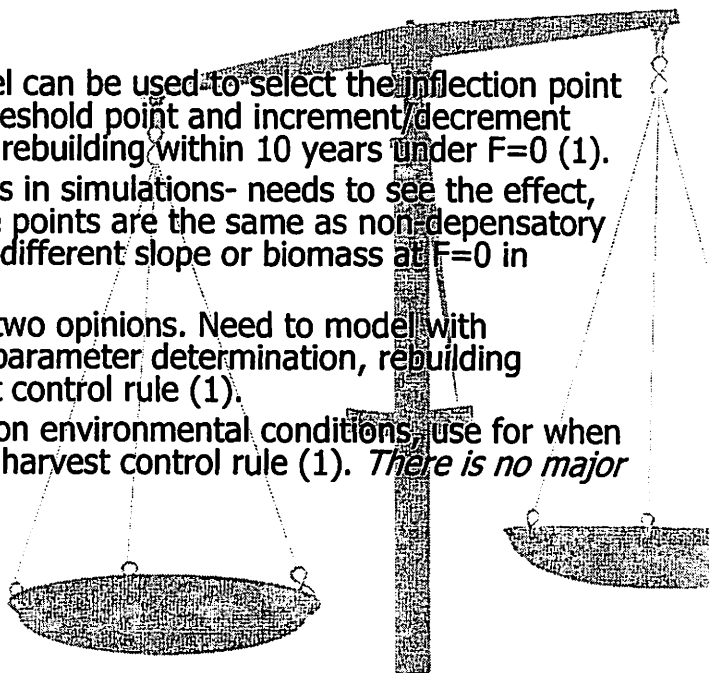
- Use most current information on S-R curve if confident in S-R data for reference points (1).
- Difficult to come up with switching productivity periods – but I am open to switching (1).
- Agree with the above two opinions (1).
- If can get range of Tau values for low and high productivity periods, use that for reference points estimation for different productivity periods. There is no clear cut answer (1). *No major conflicts, but the group is still trying to figure out how to tackle this issue.*



# Crab Modeling Issues

## M. Depensation S-R model:

- Depensatory S-R model can be used to select the inflection point as an approximate threshold point and increment/decrement near that point to get rebuilding within 10 years under  $F=0$  (1).
- Use depensation models in simulations- needs to see the effect, may be that reference points are the same as non-depensatory curves, but that need different slope or biomass at  $F=0$  in control rule (1).
- Agree with the above two opinions. Need to model with depensation for beta parameter determination, rebuilding schedules and harvest control rule (1).
- Depensation depends on environmental conditions, use for when to close the fishery in harvest control rule (1). *There is no major conflicts on this.*



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July 21, 2005

Dr. Robert Otto, Chair  
NPFMC Crab Plan Team  
Alaska Fisheries Science Center  
Kodiak, Alaska

RE: Request for Crab Plan Team review, Eastern Bering Sea Tanner crab harvest strategy and Tanner Crab Rebuilding Plan issues: (1) minimum size limit; (2) four million pound minimum GHL threshold in the Eastern district; (3) 21 million pound mature female minimum threshold in the Eastern district; (4) stair step exploitation rates.

**BACKGROUND:**

The Eastern Bering Tanner crab fishery is characterized as a robust fishery during the early 1990s, with GHLs rising to greater than 30 million pounds, followed by rapid decline and closure in the fall of 1996, the last open season of the fishery. Like other BSAI crab fisheries, this was an Olympic style fishery with 250-280 vessels competing for the GHL. Following closure of the fishery, and a National Standard #1 declaration of overfishing in 1998, ADFG began work on the development of a revised harvest strategy and the development of a rebuilding plan. The Eastern Bering Sea tanner crab harvest strategy was approved by the Board of Fisheries in March of 1999 and then incorporated into the Tanner Crab Rebuilding Plan that was adopted by the NPFMC in October of 1999. Since the harvest strategy was incorporated into the FMP, it is our understanding changes to the harvest strategy will require Board of Fisheries approval and parallel FMP plan amendments by the NPFMC.

In regards to the status of the stocks, ADFG has indicated in the 2004 report to the industry that both mature female and male abundance, although they have increased appreciably since 1998, they are still below the minimum thresholds for reopening the fishery and they expect no appreciable increase in mature female abundance or biomass for Eastern Bering Sea tanner crab for the next two years (meaning no fishery for the next two years). ADFG's area swept estimate for Eastern Subdistrict mature female biomass rose to just below the 21.0-million pound threshold in 2003, then declined to 13.2 million pounds in 2004. Abundance estimates of mature-sized females have shown only minor fluctuations above depressed levels in the Eastern Subdistrict since 1997. Overall, estimates of total mature biomass since the 1998 overfished declaration and the 2004 estimate of 100.8 million pounds, is more than twice the estimate for 1998, 37.6 million pounds. The stock status report also notes that the rate of increase in estimated total



mature biomass since 1998 has been extremely slow relative to that seen when total mature biomass increased from 48-million pounds in 1985 to 249-million pounds in 1988. (2004 Crab Stock Assessment and Fishery Evaluation Report for the King and Tanner Crab Fisheries of the Bering Sea and Aleutian Islands, NPFMC, 2004).

Management of BSAI king and tanner crab fisheries will undergo significant changes under the new NPFMC three pie IFQ/IPQ rationalized program beginning on August 15<sup>th</sup>. In March of this year the Alaska Board of Fisheries initiated numerous actions to improve management and enforcement in the BSAI crab fisheries, to encourage conservation and rebuilding of depressed stocks and to improve economic efficiency. Included in the actions taken, based on recognition of the existence of two separate stocks and TACs of bairdi, the Board of Fisheries changed the Eastern-Western Subdistrict tanner crab boundary line to 166 degrees West to coincide with the Eastern Boundary for c. opilio management. It also adopted regulations enabling concurrent harvests of tanner crab with Bristol Bay king crab, east of 166 degrees West, and concurrent harvests of tanner crab with c. opilio west of 166 degrees West. Concurrent harvests are intended to reduce discarding and mortality to discarded crabs while improving overall economic efficiency. Moving the boundary line to 166 West and adopting the concurrent harvest regulations will facilitate enforcement of two different size limits for tanner crab in the Eastern and Western districts. Pot limits in the king, snow and tanner crab fisheries have been increased to 450 pots per vessel.

#### REQUEST:

The undersigned representatives from industry wish to request the Crab Plan Team and ADF&G schedule a preliminary discussion of the harvest strategy minimum thresholds; and stair step exploitation rates for reopening the fishery; and in addition, review the minimum legal size limit, particularly in the Western district where survey data from recent years (and the Somerton thesis, 1981) indicates a lower size at maturity than in the Eastern District--- at its upcoming September 7-9 meeting in Anchorage. Following the results of this discussion, industry asks that the CPT initiate analysis to consider appropriate revisions to the Crab FMP, within the statutory constraints of National Standard #1 that govern the tanner crab rebuilding plan.

#### RATIONALE:

Review and analysis of the minimum thresholds for reopening the tanner crab fishery, and examination of the minimum size limits needs to be initiated this fall. The fishery has been closed for conservation and rebuilding since the fall of 1996, and there are overall positive signs of rebuilding in both Eastern and Western subdistrict stocks. The combined time frame for analysis and Board of Fisheries/NPFMC processing time is lengthy, and it could involve two calendar years before changes are adopted. Therefore, it is appropriate to initiate the review and analysis of the issues requested this fall, as it can prevent potential foregone harvests of tanner crab in the near future.

Environmental conditions in the Eastern Bering have changed markedly since the last fishery was conducted. Among the questions that need to be addressed in the analysis of the minimum GHL (now a TAC), and minimum mature female threshold, is the

likelihood that tanner crab stocks in the Eastern subdistrict may not rebuild to the previous levels of the 1980s and early 1990s, due to regime shift effects and temperature warming in the Eastern Bering Sea. This suggests some adjustment of these thresholds. Notably, there is a marked increase in juvenile tanner crabs in the Western subdistrict which could be an indicator of a change in the "centroid of abundance" (a westward shift in the population). An increase in biomass in this subdistrict alone could warrant a bycatch fishery within two to three years.

The framework of crab fisheries management has been changed dramatically so that it will minimize fishery impacts to the resources.

- Management of BSAI king and tanner crab fisheries, as noted above has been revised to reduce overall fishing and handling mortality. Increased pot limits to 450 pots in the king, snow and bairdi fisheries will dramatically increase soak times to enable maximum escapage of not only undersize male and female king and snow crabs, but also tanner crabs.
- With rationalization, fleet size will be reduced to an estimated 150 vessels in the first year. Additional fleet reductions are anticipated and this will reduce overall catch and discards of undersize crabs brought up in the pots.
- Approval of concurrent harvests of tanner crabs in the Bristol Bay king crab fishery and in the Bering Sea snow crab fishery means allowance for some level of retention of tanner crab as a bycatch in the directed king and snow crab fisheries, without conducting a directed fishery for tanner crab.

We appreciate your attention to this request for discussion and review of the industry concerns about the Eastern Bering Sea tanner crab harvest strategy.

Arni Thomson  
Executive Director  
Alaska Crab Coalition

Shirley Marquardt  
Mayor  
City of Unalaska

Glenn Reed  
President  
Pacific Seafood Processors Association

Phil Hanson  
Vice President  
UNISEA

Steve Minor  
Central Bering Sea Fishermens Association  
St. Paul Island, Alaska

Jim McManus  
Trident Seafoods

Ken Tippett  
Manager  
Alaska Boat Company

Sinclair Wilt  
General Manager  
Alyeska Seafoods

cc: Diana Stram, NPFMC  
Gretchen Harrington, NMFS  
Denby Lloyd, ADFG  
Art Nelson, Alaska Board of Fisheries

AGENDA D-3  
Supplemental  
OCTOBER 2005

**PACIFIC NORTHWEST CRAB INDUSTRY ADVISORY  
COMMITTEE (PNCIAC)**

P.O. Box 969  
Edmonds, WA 98020  
360 440 4737  
[steve@wafro.com](mailto:steve@wafro.com)

October 4, 2005

Wayne Donaldson,  
Acting Supervisor  
ADFG, Westward Region  
Kodiak, Alaska

Dear Wayne:

On behalf of the members of the PNCIAC, I wish to express our sincere thanks to you and your staff for coming to Seattle yesterday to make presentations on the Status of the BSAI Crab Stocks and ongoing related research and analysis of crab stocks.

I also wish to reiterate PNCIAC members concern and recommendations regarding the issue of clean and dark shell components of the snow crab TAC that ADFG managers raised again yesterday at the meeting. As I noted yesterday, PNCIAC responded to the ADFG request for input on industry recommendations for monitoring and controlling harvests of snow crab to limit the quantities of clean shell recruit crabs to maintain compliance with State of Alaska regulations.

PNCIAC responded to ADFG's request in an email memorandum dated September 21, 2005, following an informal meeting and teleconference of PNCIAC members and a few other industry participants at the Icicle Building in Seattle on September 20<sup>th</sup>. The essence of the memorandum and the recommendations are as follows:

In the two weeks prior to the meeting on September 20th, I had a number of meetings with both processing sector and harvesting sector representatives of the Bering Sea crab industry to discuss dark shell crab issues as you requested. On September 20<sup>th</sup>, we had an informal meeting of more than a dozen industry members, including both current PNCIAC members and other industry representatives. Here is a summary of the input I have received:

1. This is considered a huge policy issue by the industry, because it will impact (a) the relationship between harvesters and processors as they attempt to establish a value for dark shell crab and (b) the relationship between the industry and the marketplace.
2. If the policy is not well designed, it has the potential to re-start the race for fish. This is a universal concern. As you know we have just completed a very bruising, nearly 6-year effort to stop the race for fish and the consequent loss of life and harm to the resource. An ill-designed dark shell policy has the potential for re-starting that race, as

harvesters try to be the first on the grounds to catch clean shell crab; leaving the late-starters to harvest the dark shell component of the TAC. We must all work together in the development of a new policy to avoid this outcome.

3. The industry wants to fully participate in the development of a new policy approach, and they have asked me (as PNCIAC chair) to request the following:

a. A clear definition of "dark shell" crab including photo examples and descriptions; further, some clarifications as to the Department's basis for drawing distinctions between dark shell, old shell and skip-molt crab. It was further pointed out that the Department's definition may or may not be consistent with the marketplace definitions (standards) and that an open discussion between industry and the Department would be very beneficial.

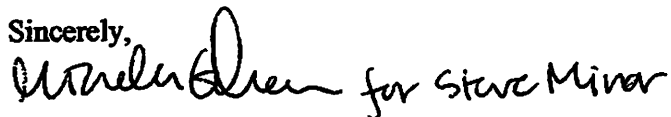
b. A proposed Department policy to frame the discussion, in particular, industry members asked how the policy would be applied to the new IFQ/TAC management regime.

c. Some understanding of how the new policy would be enforced: at the vessel level? at the aggregate TAC level? and what role will observers play in the enforcement process?

4. Concerns were raised about the recent gap between survey results and fishing results. In other words, even though recent surveys have shown significant dark shell populations in some areas, fishing results have been quite different. No one is sure why this is occurring, and under the new IFQ/TAC regime we would expect that harvesters will fish even "cleaner" by avoiding areas where lesser value crab are believed to be ... so again, this is an area where an open dialogue between the Department and industry would be very useful.

5. Finally, there is a very significant concern that the development of this policy (a) requires some market analysis on the part of industry but (b) the new crab rationalization anti-trust provisions will severely limit that conversation.

Sincerely,



Steve Minor, Chair  
PNCIAC

cc: McKie Campbell, Commissioner, ADFG  
Denby Lloyd, Director, Commercial Fisheries and Development, ADFG  
Diana Stram, Crab Plan Team Coordinator, NPFMC

Proposal – Regulatory Amendment – Bering Sea/Aleutian Islands FMP  
October 3, 2005  
Submitted by: Undersigned

Proposal: Change the enforcement period for Maximum Retainable Allowances (MRA) from instantaneous during a regulatory week to an offload basis.

Need for Action: Substantial portions of the discards by the BSAI non AFA C/P fleet (H/G Sector) are regulatory discards (discards required under NMFS regulations) and are species that have value to the sector. The reason for these discards in many cases is due to a species or species group being placed on bycatch status. Once a species is on bycatch status, it may only be retained by a vessel up to a limit that is calculated as a percentage of those species that are on directed status that are retained by a vessel. The calculation of the amount of the retainable allowance is based on a regulatory fishing trip (as opposed to a fishing trip that begins with an empty hold and ends with an offload) that is either from Saturday midnight to Saturday midnight or some shorter period. The enforcement period is instantaneous – at any point during the regulatory week, a vessel must be in compliance at any moment.

This enforcement snapshot results in fish that are on bycatch status being discarded by regulation early in a fishing week even though they would be legal at the end of week. For example, a vessel begins its regulatory week on Saturday at midnight. During this trip they are targeting on Pacific cod and expect to take incidental amounts of rock sole – which is on bycatch status. By Sunday evening, the vessel has caught 20 mt round weight equivalent (RWE) of its target, Pacific cod and has retained it all. They have also caught 20 mt of rock sole RWE but could only legally retain 4 mt RWE and had to discard 16 mt. By the end of the fishing week on Saturday midnight, the vessel has on board 300 mt RWE of Pacific Cod and should have been able to keep 60 mt RWE of rock sole; however because of the snapshot enforcement standard, the vessel only has on board 40 mt RWE of rock sole and discarded another 20 mt of rock sole as, at the time it was caught, the vessel lacked adequate basis species to legally retain it. Further, the vessel is not yet full and will be fishing another few days; but the target/retainable allowance calculation starts at zero again on midnight Saturday. If NOAA Office of Law Enforcement (OLE) conducts an offload audit when the vessel delivers its catch, it requires intense comparison of observer and logbook entries to determine if the vessel was legally retaining bycatch species based on the target species on board at the time of the catch of bycatch. Even if the vessel has a legal amount in total of the bycatch species on board at the time of the offload audit, they could still be in violation of the regulation if those species were caught before the basis species were on board.

The proposed regulatory amendment would change the enforcement period to an offload basis of a real fishing trip, beginning with an empty hold and ending with an offload. Under this scenario, the vessel captain knew he would have 400 mt RWE of Pacific cod as the basis for retention of species on bycatch so he knew he could have up to 80 mt RWE of rock sole when the vessel offloaded. So, if he began the trip in the search mode and encountered rock sole right away, the vessel could still retain that rock sole as it would be legal at the time of offload. When the vessel comes to port, NOAA OLE conducts an offload audit simplified by counting cases of the various species without having to determine when each was caught in relation to the other.

Regulatory History: A regulatory amendment changing the enforcement period for Pollock only was put into effect in late 2004. In season Management presented the effects of the rule change at the October 2005 Council meeting comparing retention of Pollock between the first nine months of 2004 and the same period in 2005 (Graphic contained in In Season Management's Management Report in the "B" Reports Supplemental). The retention gain is somewhere in the order of 15% from 2004 to 2005. The H/G sector's incidental catch for that time period was a little more than the catch of Pollock in 2004 and less than the catch of Pollock in 2003.

Benefits: This rule change would reduce regulatory discards for the H/G sector enabling the fleet to retain more fish and help with compliance with the Groundfish Retention Standard (GRS.) (Regulatory discards are included in the denominator when calculating a vessel's compliance with the GRS.) Changing the enforcement period also eases compliance monitoring as the OLE can conduct complete hold audits at the time of offload in port rather than at sea. This regulatory amendment would also be practicable – resulting in reduced costs to the fleet, improved retention, and a net economic benefit to the fishery and the nation.

To the extent that a change would reduce overall catch of certain species (as has happened with Pollock), it may also delay or prevent the placing of those species on Prohibited Species Status as has happened in 2004 and 2005.

Submitted by:

Kodiak Fish Company

Jubilee Fisheries

Cascade Fishing

US Seafoods

Fishing Company of Alaska

Fisherman's Finest

O'Hara Corporation

Iquique US

Golden Fleece Inc.

*[Handwritten signatures and initials over the list of companies]*

Revised Proposal Language  
Regulatory Amendment – Bering Sea/Aleutian Islands FMP  
October 10, 2005

Proposal: Change the enforcement period for Minimum Retention Allowance from instantaneous during a regulatory week to an offload basis or to a change in the status of any fish retained on board due to either (1) an inseason management measure or (2) the vessel's movement to a different regulatory area.