

## **DRAFT Minutes of the Bering Sea/Aleutian Islands Crab Plan Team Meeting, September 19-20, 2002**

### Members Present:

*Doug Pengilly (ADF&G, chair)*  
*Wayne Donaldson (ADF&G)*  
*Forrest Bowers (ADF&G)*  
*Herman Savviko (ADF&G)*  
*Shareef Siddeek (ADF&G)*

*Bob Otto (NMFS)*  
*Jack Turnock (NMFS)*  
*Joshua Greenberg (UAF)*  
*Dave Witherell (NPFMC)*

The Bering Sea/Aleutian Islands (BSAI) Crab Plan Team met September 19-20 in Anchorage. The Team meeting was held to prepare the annual stock assessment and fishery evaluation (SAFE) report and review guideline harvest levels (GHLs). The meeting was based on the following agenda.

### Agenda

Discussion of a stock assessment workshop and schedule  
Request for Review of Bristol Bay red king crab harvest strategy  
Status reports on development of biological reference points  
Prepare and review SAFE report

Doug Pengilly agreed to be chair for the next 2 years. Wayne Donaldson agreed to give the plan team report to the Council in Seattle, as Doug has other commitments. Bob Otto also indicated he would attend and be able to give some overview of stock status if questions should arise.

### **Stock Assessment Workshop and Schedule**

The limited time frame for analyzing survey data, running population dynamics models, reviewing results and estimating GHLs for crab stocks was discussed. The short time between when survey data are available and when GHL's are currently announced prohibits a thorough review and analysis of survey data and stock assessment modeling. Due to the current starts of fishing seasons for St. Matthew blue king crab and Pribilof Islands blue and red king crabs, announcements of GHL's cannot be moved to later dates.

The crab plan team recommends delaying announcement of GHL's for Bristol Bay red king crab and Bering Sea Tanner crab to no earlier than September 1, and Bering Sea Snow crab GHL to no earlier than October 1. Future scheduling of annual surveys and determination of seasonal opening dates and preregistration requirements should consider the need for sufficient time for stock assessment review. An annual stock assessment workshop (SAW) was suggested for reviewing stock assessment models and harvest strategies, which could occur in December of each year in conjunction with the annual interagency crab research meeting. Jack Turnock will be responsible for organizing the annual SAW. The SAW would review assessments in detail and make recommendations for improvement to assessments and recommend models to be used for setting future GHL's. The first SAW was scheduled for December 2002 to review the Bering Sea snow crab stock assessment model and harvest strategy. Other assessments and topics may be discussed as time allows.

### **Review of Red King Crab Harvest Strategy**

The team received requests from Doug Wells, Gary Painter, and the Alaska Crab Coalition to consider an intermediate step in the Bristol Bay red king crab mature exploitation rate between 10% and 15%. This request also had the support of 9 of 11 PNCIAC members. The team endorses evaluation of this proposal, and requests ADF&G to analyze the Bristol Bay red king crab harvest strategy relative to two alternatives:

- 1) a 12.5% exploitation rate when  $ESB \geq 34.75$  million pounds and  $ESB < 55$  million pounds.
- 2) a continuous linear function for the exploitation rate between 10% at threshold to 15% at  $ESB = 55$  million pounds

### Biological Reference Points

Siddeek provided the Team with a review of his work on biological reference point estimates for seven BSAI crab stocks. The estimates were based on a catch survey analysis model using published stock parameter values. His results indicated that  $F_{MSY}$  is higher than  $M$  in most cases and current maximum harvest rates for snow and Tanner crabs may be too high. The major recommendations are:

1. A modified MSY estimation method
2. Evaluate the current practice of equating  $F_{MSY}$  to  $M$
3. Redefinition of MSST:  
 $MSST = 0.7 SSB_{MSY}$  for king crabs  
 $MSST = 0.6 SSB_{MSY}$  for Tanner and snow crabs

The discussion on his presentation pointed out the following:

1. Results depended on the choice of Tau and mating ratios, which are more difficult to determine. Although he had estimated a median value for probable Tau and mating ratios and plausible values of  $M$ , he could use Bayesian analysis to choose appropriate values of various unknown parameters: Tau, mating ratio,  $M$ .
2. A better approach may be to determine BRPs for two well studied stocks – Bristol Bay red king and Bering Sea snow crabs – and suggest proxies for other data poor stocks based on these results. Consider the following in the analysis:
  - a) Incorporate effects of terminal molt on BRPs of snow crab
  - b) Estimate BRPs based on sex, stage specific natural, bycatch, and fishing mortality
  - c) Do sensitivity analysis of BRPs to varying legal size limits, season, and season duration
  - d) Introduce process errors, including autocorrelated errors, to the stock-recruitment models and estimate distribution patterns of BRPs
  - e) Examine stock-recruitment independent estimate of proxy reference point fishing mortality rates
  - f) Investigate any insight on Tau value by looking at data from other areas that have been at prolonged low levels (e.g., Kodiak red king crab)
  - g) Highlight what knowledge gaps exist and what research needs to be done
  - h) Suggest a way to determine a practical virgin biomass
  - i) Use model output biomass values rather than area swept estimates to determine virgin biomass

The team found the approach to be worth further consideration as an alternative to the present method for determining overfishing rates,  $B_{msy}$ , and MSST. The team recommended that this approach be further considered when the team reevaluates overfishing and  $B_{msy}$  definitions in 2003.

### SAFE Report

This year's SAFE report includes the beginnings of a new section with additional economic information on BSAI crab fisheries. The team anticipates that this chapter will be more fully developed in coming years.

Regarding status of stocks, the survey continued to indicate positive signs of future recruitment for Bairdi Tanner crab and Bristol Bay red king crab. For opilio crab, however, the survey indicated much fewer pre-recruit crab than expected. The Pribilof Islands blue king crab biomass was estimated to be below a threshold level, so a rebuilding plan will likely be required. The team discussed how to approach a rebuilding plan for this stock, which is not subject to any fishing mortality (fishery has been closed for

years) or other sources of human disturbance (Pribilof Island Habitat Protection Area allows no trawling). An analysis will need to be done to determine if the current harvest strategy for this stock will result in rebuilding within the time frame allowed under National Standard guidelines (excerpt below):

These factors enter into the specification of the time period for rebuilding as follows:

- (1) The lower limit of the specified time period for rebuilding is determined by the status and biology of the stock or stock complex and its interactions with other components of the marine ecosystem, and is defined as the amount of time that would be required for rebuilding if fishing mortality were eliminated entirely.
- (2) If the lower limit is less than 10 years, then the specified time period for rebuilding may be adjusted upward to the extent warranted by the needs of fishing communities and recommendations by international organizations in which the United States participates, except that no such upward adjustment can result in the specified time period exceeding 10 years, unless management measures under an international agreement in which the United States participates dictate otherwise.
- (3) If the lower limit is 10 years or greater, then the specified time period for rebuilding may be adjusted upward to the extent warranted by the needs of fishing communities and recommendations by international organizations in which the United States participates, except that no such upward adjustment can exceed the rebuilding period calculated in the absence of fishing mortality, plus one mean generation time or equivalent period based on the species' life-history characteristics. For example, suppose a stock could be rebuilt within 12 years in the absence of any fishing mortality, and has a mean generation time of 8 years. The rebuilding period, in this case, could be as long as 20 years

The team adjourned at approximately 2:30 pm on Friday, September 20.

Others in attendance were: Tom Casey, Mark Fina (NPFMC), Wesley Loy.