


MEMORANDUM

TO: Council, SSC and AP Members

FROM: Clarence G. Pautzke
Executive Director 

DATE: September 23, 1998

SUBJECT: BSAI Crab SAFE and *C. bairdi* Rebuilding Plan

ESTIMATED TIME 1 HOUR

ACTION REQUIRED

- (a) Review the Crab SAFE.
- (b) Develop alternatives for *C. bairdi* rebuilding plan analysis.

BACKGROUND

(a) BSAI Crab SAFE

The Crab Plan Team recently assembled a Stock Assessment and Fishery Evaluation (SAFE) report for king and Tanner crab stocks of the Bering Sea and Aleutian Islands. The SAFE details the current biological and economic status of fisheries, guideline harvest levels (GHL), and support for different management decisions or changes in harvest strategies. Copies of the SAFE were distributed in September.

The status of BSAI crab stocks is mixed. Some stocks are increasing in abundance (Bristol Bay red king crab), whereas other stocks are declining (*C. opilio*). A summary of the 1998 survey results is attached as Item D-5(a).

(b) *C. bairdi* Rebuilding Plan

In 1996, the Sustainable Fisheries Act (SFA) amended the Magnuson-Stevens Act. The SFA added a definition of "overfishing" and "overfished," changed the definition of "optimum," required that each fishery management plan specify objective and measurable criteria for identifying when a fishery is overfished and added a section on identifying and rebuilding overfished fisheries.

In June 1998, the Council adopted Amendment 7 to the BSAI King and Tanner Crab FMP to redefine overfishing, OY, and MSY, and update the FMP with new information. The amendment will establish MSY point estimates, along with minimum stock size thresholds (MSST) for individual crab stocks based on prevailing environmental conditions (1983-1997 period). Overfishing will be defined as a fishing mortality rate in excess of natural mortality ($M=0.2$ for king crabs, $M=0.3$ for Tanner crabs) or a biomass that falls below MSST. Because the current *C. bairdi* spawning biomass is below MSST, the stock will be deemed "overfished" based on the guidelines, and will require that a rebuilding plan be developed within the coming year.

In August, the Crab Plan Team met to review amendment proposals and discuss options for *C. bairdi* rebuilding. The Team discussed content of a rebuilding plan, and agreed that all sources of mortality (including bycatch in

crab, scallop and groundfish fisheries) should be considered in the analysis. The major component of the plan is the harvest strategy being developed by ADF&G. The Team felt that a stairstep harvest rate and associated thresholds should be considered, along the lines of the strategy developed two years ago for the Bristol Bay red king crab stock. This approach is also advocated in the NOAA Technical Manual (Restrepo et al. 1998).

A major unknown at this time is whether or not *C. bairdi* should be managed as two separate stocks east and west of 168°W. Two separate rebuilding plans may be required, as there are currently very few *C. bairdi* in the western area around the Pribilof Islands. The evidence for two separate stocks comes from differences in growth, size frequencies, size at maturity, and genetic work. If two stocks were considered by managers, and different size limits were needed for each stock, then options considered could include a *C. bairdi* fishery on the eastern stock coincident with the red king fishery in Bristol Bay, a fishery on the western stock coincident with the *C. opilio* fishery or depending on size of the western stock, harvest as bycatch in the *C. opilio* fishery.

Crab Plan Team chair Peggy Murphy will be on hand to discuss proposed contents of the plan and a timeline for analysis. Plan Team minutes are attached as Item D-5(b).

RESULTS OF THE 1998 NMFS BERING SEA CRAB SURVEY
EXECUTIVE SUMMARY

This section summarizes data presented in the Report to Industry on the 1998 Eastern Bering Sea Trawl Survey. Numbers presented are trawl survey indices of population level and do not necessarily represent absolute abundance. For further information, contact Dr. Bradley G. Stevens or Dr. Robert S. Otto, NMFS, P.O. Box 1638, Kodiak, AK 99615. Phone (907) 487 5961. (GHL = Guideline Harvest Level.)

Red king crab (*Paralithodes camtschaticus*) Bristol Bay.

Legal males: 7.4 million crabs; -21% change.

Pre-recruits: 16.5 million crabs; 85% change.

Large Females: 35.3 million crabs; 42% change.

Outlook: Abundance of mature, pre-recruit males has increased due to growth of a recruiting cohort, offsetting the decline of aging legal males. Increased abundance of mature females allows use of a 15% exploitation rate.

GHL: 16.4 million lbs (7,446 metric tons, mt). Fishery opens November 1.

Red king crab (*P. camtschaticus*) Pribilof District.

Legal males: 0.4 million crabs; -63% change.

Pre-recruits: 0.5 million crabs; no change.

Large Females: 1.0 million crabs; no change.

Outlook: Legal and pre-recruit male crabs are highly concentrated and index has very low precision. Females are poorly estimated. Survey and fishery data indicate a long-term population decline. Red king crab are scarce in the Pribilof Islands and usually harvested incidental to blue king crabs.

GHL: Fishery combined with blue king crab (see below).

Pribilof Islands blue king crab (*P. plat us*) Pribilof District.

Legal males: 0.8 million crabs; no change.

Pre-recruits: 0.4 million crabs; 17% change.

Large Females: 2.0 million crabs; 20% change.

Outlook: Population is low and trends are not easily detectable.

GHL: 1.3 million lbs (590 mt) of red and blue king crabs. Fishery opens September 15.

St. Matthew blue king crab (*P. plat us*) Northern District.

Legal males: 3.1 million crabs; -21% change.

Pre-recruits: 1.8 million crabs; -21% change.

Large Females: Not well estimated.

Outlook: Population is above average levels. Annual abundance estimates are affected by the portion of the stock occupying untrawlable grounds.

GHL: 3.8 million lbs (1,725 mt). Fishery opens September 15.

Tanner crab (*Chionoecetes bairdi*) Eastern District.

Legal males: 2.2 million crabs; -36% change.

Pre-recruits: 12.1 million crabs; 22% change.

Large Females: 6.5 million crabs; -35% change.

Outlook: Population still declining, but some recruitment is apparent. This year's estimates of legal males and large females are the lowest in the history of the survey.

GHL: Fishery will not open in 1998.

Snow crab (*C. opilio*) All districts combined.

Large males: 255 million crabs; -17% change.

Small males: 1.015 million crabs; -32% change.

Large Females: 1,161 million crabs; -16% change.

Outlook: Abundance of large males has peaked and declined slightly from last year. This population is expected to decline rapidly next year, but continued recruitment of small crab may offset that somewhat.

GHL: 196.0 million lbs (89,000 mt). Fishery opens January 15, 1999.

Hair crab (*Erimacrus isenbeckii*)

Large males: 2.9 million crabs; -32% change.

Large Females: Not well estimated.

Outlook: Population is declining and recruitment trends are not apparent.

GHL: 0.5 million lbs (227 mt) Pribilof District only. Fishery opens November 1.

**DRAFT Minutes of the
Bering Sea/Aleutian Islands Crab Plan Team
Meeting, August 19 and 20, 1998**

Members Present:

Peggy Murphy (ADF&G, chair)
Gretchen Harrington (NMFS)
Mark Herrmann (UAF)
Al Spalinger (ADF&G)

Rance Morrison (ADF&G)
Bob Otto (NMFS)
Jack Turnock (NMFS)
Doug Pengilly (ADF&G)
Dave Witherell (NPFMC)

The Bering Sea/Aleutian Islands (BSAI) Crab Plan Team met on August 19-20 in Anchorage. The Team meeting was conducted based on the following agenda:

Introductions, Agenda, Meeting Minutes
Status of BSAI king (and Tanner ?) crab stocks
Guideline Harvest Levels for BSAI king (and Tanner?) crab stocks
Receive report on NPFMC/BOF committee meeting July 29-30
Receive report on Crab License Limitation Amendment
Overview of category 2 BOF proposals
Outline Tanner crab rebuilding plan
Review proposals to amend the crab FMP and make recommendations
Review scallop and groundfish FMP proposals pertaining to BSAI king and Tanner crabs
Assemble SAFE document
Other issues for discussion.

Following introductions and a review of the agenda, several items of news were discussed. First, several new faces were in attendance. Jack Turnock was filling in for Jerry Reeves, who recently retired. Gretchen Harrington filled in for Kim Rivera, who moved over to protected resources division of NMFS. Mark Herrmann has been officially designated to replace Josh Greenberg who is on sabbatical in New England. It was noticed that Al Spalinger was planning to retire in December, so a replacement for him will be forthcoming. As punishment, the team agreed that Al should be heavily burdened with crab team assignments during the next few months. Of note, a new NMFS laboratory opened in Kodiak this month, congratulations to Bob Otto! Other items of interest included notification of the Directors meeting with crab industry on September 29 in Anchorage, an update on response to SSC concerns about the overfishing EA/RJR, a letter from Council member Dennis Austin concerning clarification of Bristol Bay red king crab assessment methodology, and a letter to Jay Johnson regarding the 17.9 million pound MSY estimate for this stock. Regarding the last item, the crab team agreed that GHs should be able to exceed 17.9 million pounds when stock conditions warrant such a harvest. Rance notified the team that he had received a call from the Governors office seeking information on crab bycatch in groundfish fisheries. In response, Dave drafted a summary paper that was reviewed and approved by the team.

Survey Results

Bob Otto provided a summary of this summers Bering Sea trawl survey. Because the Center intends to reduce survey tow time from 30 to 15 minutes, several extra days of survey time were spent making comparative research tows. Due to the delay, survey data for Bristol Bay red king crab and Tanner crab would not be ready until the last full week of August. Bob made several general observations during his time on the vessel. First,

the water was warmer than usual, and this affected the distribution of a number of species. As with last year, coccolithophores were present over a wide area, and rock sole were encountered north of St. Matthew. White-sided dolphins were observed for the first time in the Bering Sea. Other observations included a large number of 25-30 cm cod, very few small *C. opilio*, and relatively high prevalence of bitter crab disease around St. Matthew.

Guideline Harvest Levels

The team discussed stock status and GHs for species where data were already available. Like last year, the GH for **Pribilof Islands king crabs** includes both red and blue king crab. A GH of 1.3 million pounds was established based on a 10% exploitation rate of the combined abundance of mature king crab. Abundance of these crab is relatively stable, with blue kings up slightly, and red kings down somewhat. The **St. Matthew Island blue king crab** stock also appeared stable. A GH for the St. Matthew Island stock was established at 4.1 million pounds based on a 20% exploitation rate of mature males. The fishery for St. Matthew and the Pribilof Islands king crab begins on September 15. The **Aleutian Islands brown king crab** GH was established at 3.0 million pounds east of 174° and 3.3 million pounds west of 174°. These GHs were based on a slightly more conservative rate than last year, as CPUE from last years fishery declined dramatically during the season. The survey index of **Pribilof Islands hair crabs** indicated a continuing decay of a large cohort. The GH was established at 400,000 pounds. This fishery can be prosecuted by up to 24 vessels using longlined conical pots. Hair crab is not an FMP species.

LLP and Buyback Program

Chris Oliver provided a summary report on the status of the Council's Groundfish/Crab License Limitation Program and the vessel license buyback program developed by industry. In October, the Council will be considering a plan amendment to further reduce the number of crab licenses originally adopted under Amendment 5. Under that amendment, 365 vessels qualified to fish for BSAI crabs (not including Norton Sound red king crab) based on a two tier qualification. The amendment currently under consideration would add a third tier of qualification, by allowing only those vessels that fished in the year(s) 1995 through February 8, 1998 to get a license. The most restrictive option would issue licenses to only 195 vessels, whereas a more moderate option (fishing any one year between 1995-1998) would issue licenses to 293 vessels. Severability of licenses (groundfish/crab) would be considered for a buyback program only, not for transfers. The team noted that management of this fishery is impacted by the number of vessels participating, particularly for those fisheries regulated by pot limits. The license limitation option chosen by the Council will also determine the need for, or at least shape of, a crab vessel license buyback program. The C.R.A.B. group has prepared a vessel buyback plan, which was distributed, to the entire crab fleet for comment. Once the Council makes a decision on the license program, the buyback plan could be revised and submitted to the Secretary. Chris noted that as currently written, the A:B license designation of the buyback plan is inconsistent with the FMP. The team requested that Mark Herrmann, the team's economist, provide comments regarding the buyback plan. Given the brief time available for review, comments should be considered preliminary. The team reviewed and endorsed the comments that are attached.

Board of Fisheries and FMP Amendment Proposals

The Team looked over the proposals submitted to the Board of Fisheries for consideration at their spring 1999 meeting. The team noted that the following proposals were category 2 measures that will be reviewed for consistency with the FMP: 281, 285, 286, 287, 288, 289, 290, 292, 298, 299, 300, and 301. These proposals address harvest strategies and guideline harvest levels, season dates, and size limits.

The Team also reviewed the proposals submitted to the Council to amend the crab FMP or groundfish FMP (bycatch management). The team provided comments on each proposal, and these comments are summarized below:

- Proposal 7 This proposal seeks to create trawl closure zones in areas of high *C. opilio* bycatch rates. Team members were concerned about movement of *C. opilio* crab. Survey data indicate that this stock can have widespread distribution, and the centers of concentration shift annually. Hence, an area that appears to be a low bycatch area this year may contain a lot of snow crabs next year, and vice-versa. The team was also concerned about tradeoffs with other PSC's by shifting the fleet into other areas. Most team members felt that the PSC cap approach was adequate to control snow crab bycatch.
- Proposal 8 This proposal seeks to create trawl closure zones in areas of high *C. bairdi* bycatch rates. Many of the comments for proposal 7 apply. The team noted that more information on Tanner crab bycatch will be generated from the rebuilding analysis, and ideas from this proposal could be incorporated.
- Proposal 9 This proposal seeks to subdivide the bycatch limitation zones into smaller management areas. The Team noted that a possible drawback of this would potentially limit the fleet from avoiding areas of high bycatch. Also, because the distribution of crab changes, small areas with specific bycatch limits could potentially create a worse situation for bycatch, and add to the management costs for the groundfish fleet. That said, the Team agreed that bycatch limitation zones for Tanner crab should be examined in the analysis of the *C. bairdi* rebuilding plan. If information warrants splitting the stock into two separate stocks, bycatch management zone boundaries may need to be changed.
- Proposal 11 This proposal seeks to identify specific locations of HAPC living substrate. The first step would be to look at what we have for information; the second step would be to identify research needs. **The Plan Team supports this proposal.**
- Proposal 12 This proposal seeks to examine particular areas as HAPC designation. In particular, the Team noted that two areas, the shelf break and fine-grained sediments, are important for *C. bairdi* and *C. opilio* crab. The Team support continued research to examine the importance of these habitats.
- Proposal 13 This proposal seeks to establish a procedure to assess potential impacts on specific areas designated as HAPC. **The Team supports this proposal**, and supports continued research on fishing gear impacts.
- Proposal 14 This proposal seeks to decrease PSC limits of crab (and other PSC species) by up to 10% per year over 5 years. The Team noted that crab bycatch limits were only recently reduced, and were driven by industry negotiations (allocative decisions). At this time, the Team does not have conservation concerns about the bycatch level of red king crab. The Team also feels that the current *C. opilio* caps should be in place for a few years, then re-evaluated for possible changes. Regarding *C. bairdi*, the team will address all sources of mortality, including PSC bycatch, as part of the rebuilding plan. In general, the Team felt that the proposed reduction was generic, and that bycatch limits should be based to some extent on population abundance. Team members further noticed that there were other options available to reduce bycatch (such as VBAs).

- Proposal 16 This proposal seeks to designate three areas as HAPC. The Team limited its comments only to the Chirikov Basin area, as it is within the BSAI. The Team notes that this area may be very important for whales, it was not considered to be a HAPC for crab. Although there are some *C. opilio* and blue king crab in the area, they are not commercial size or quantity.
- Proposal 19 This proposal seeks to establish a "no fishing zone" in a specified area of the Bering Sea. The stated objective of the proposal is to protect critical habitat for *C. bairdi* crab. The Team noted that the proposed location did not overlay habitat normally utilized by *C. bairdi*. The Team noted that *C. bairdi* are widely distributed over mud and silt substrates at depths greater than 200 feet, and that the distribution shifted from year to year. The Team suggests that closure areas be given some consideration in the *C. bairdi* rebuilding analysis.
- Proposal 28 This proposal seeks to change PSC limits for crab from a number-based limit to a weight-based limit. The Team supports the weight-based concept, as it minimizes impacts to crab when the population is composed of large animals, and also minimizes potential costs to the industry when there are large numbers of small animals. The team notes though, that such a system may require re-prioritizing observer duties.
- Proposal 30 This proposal seeks to amend the crab and groundfish FMP to develop a comprehensive IFQ system for these fisheries. The Team supports this proposal in that it addresses overcapacity and the race for fish. The Team noted, however, that there might be other options available for crab fishery management, such as individual transferrable pot quotas (ITPQ's).
- Proposal 35 This proposal seeks to develop options for a permit buyback program for the BSAI crab fisheries. A business plan for the buyback program has already been developed by industry and awaits further Council action on license limitation prior to moving ahead. The Team agreed that reducing capacity of the fleet would be beneficial, and requested that Mark Hermann provide additional comments for team consideration (see attached).

The Team did not generate any proposals of their own, although several ideas were discussed.

C. bairdi Rebuilding Plan

The Team discussed development of a rebuilding plan for Bering Sea *C. bairdi*. It was decided that brief outline of the plan development, including proposed alternatives and options, would be presented to the Council in October (along with the status of stocks report). Peggy will prepare a flow chart showing proposed contents and timeline for analysis. A draft EA/RIR would then be prepared for initial review in February, if all analysis can be completed on time. This would allow the Board an opportunity to have input into the plan, as they meet jointly with the Council at the February meeting. Final action could then be taken by the Council in April or June, after the Board has adopted a harvest strategy for the *C. bairdi* fishery.

The Team discussed content of a rebuilding plan, and agreed that all sources of mortality (including bycatch in crab, scallop and groundfish fisheries) should be considered in the analysis. The major component of the plan is the harvest strategy being developed by ADF&G. The Team felt that a staircase harvest rate and associated thresholds should be considered, along the lines of the strategy developed two years ago for the Bristol Bay red king crab stock. This approach is also advocated in the NOAA Technical Manual (Restrepo et al. 1998).

A major unknown at this time is whether or not *C. bairdi* should be managed as two separate stocks east and west of 168°. Two separate rebuilding plans may be required, as there are currently very few *C. bairdi* in the western area around the Pribilof Islands. The evidence for two separate stocks comes from differences in growth, size frequencies, size at maturity, and genetic work. If two stocks were considered by managers, and different size limits were needed for each stock, then options considered could include a *C. bairdi* fishery on the eastern stock coincident with the red king fishery in Bristol Bay, a fishery on the western stock coincident with the *C. opilio* fishery or depending on size of the western stock, harvest as bycatch in the *C. opilio* fishery.

Preparation of the rebuilding plan will require multi-agency tasking. Dave will provide the boilerplate language and will serve as overall editor. Peggy will be responsible for providing the analysis of stock identification and the ADF&G harvest strategy. Jack Turnock will provide bycatch information from the groundfish fleet. Bob and Doug will examine bycatch distribution in the scallop, crab, and groundfish fisheries. Other tasks will be assigned to Team members as they arise.

SAFE Report

The Team discussed what to include in this year's SAFE report. It was decided that the format would be similar to last years SAFE, and would include the Westward Region Area Management Report, the Norton Sound Report, News Releases, anecdotal information on the environment and fisheries in 1998, and a bibliography of new publications on crab research and management. Dave will assemble the components under one cover and distribute to the Council prior to the October meeting.

Others in attendance were: John Hendershedt, Clyde Sterling, Tom Casey, Arni Thomson, Ed Glotfelty, Rob Rogers, Frank Kelty, Tom Anglin, Fran Bennis, and Pete Probasco.

**Comments on the Proposed Buyback of Licenses
for the Crab Fisheries of BSAI by the C.R.A.B. Group
by Mark Herrmann**

Note: These comments were prepared at the request of the Crab Plan Team in a very short period of time and reflect my initial thoughts and are not meant to be construed as my final opinions.

The vessel buyback plan (June 5, 1998) is well thought out and written. It addresses a problem of overcapitalization of the BSAI king and Tanner (*C. bairdi* and *C. opilio*) crab fisheries. This problem of overcapitalization seems to be overwhelmingly accepted by management and industry. C.R.A.B. writes "the objective of the buyback is the maximum sustained reduction in fishery capacity in these fisheries, at least cost, in the minimum at time" (p. 14). This may very well be the case, especially considering the time period. This buyback program works only in conjunction with the soon to be implemented license limitation program (LLP). Reducing vessels moves the fishery towards a goal of maximizing net benefits to the nation. The proposed buyback program attempts to be fair and equitable in allocation by dividing the crab fleet into "A" and "B" licenses and then by using a reversed auction scheme. It is likely that the division of the A and B fleet will be more highly contested than the proposed auction. The proposed auction attempts to reward both low buyout bids and most productive vessels in terms of landings. An August 11 letter by Fred Yeck indicates that the A:B list may not be accepted by the trawler/crabber segment of the industry. His main point seems to be that a vessel which has incurred the high cost of fishery diversification would be unduly punished by being B listed. The C.R.A.B. group might counter (conjecture) that without the B list that a buyback program would be ineffectual as vessels with a lesser participation rate would flood back into a more lucrative fishery negating gains of a buyback. Both opinions may be valid points. However, allocation or misallocation of harvest is a matter of property rights to be sorted out by the industry. For example, do B listed vessels have the right to equal opportunity of harvest or not. A major selling point of this proposal is that it is industry driven and may lower the amount of gear on the fishing grounds.

There are other possible alternatives to reduce fishing pressures. One is the Individual Transferable Pot Quotas (ITPQ). Under this management scheme, pots are allocated to each vessel and then the vessels can buy and sell pots. The objective would be to have the more efficient vessels purchase pots from the least efficient vessels. A buyback of pots could also be undertaken at the same time. This could effectively achieve the same results of the vessel buyback program without loans and additionally give vessel more flexibility in gearing their vessels to fish a more efficient number of pots. Vessels selling all their pots would be compensated for leaving the fishery.

Another option is IFQs. Here, the percentage of allowable GHs are traded with or without gear restrictions. IFQs offer many of the same advantages of ITPQs but may also further reduce cost by eliminating the race for fish. However, one serious problem under IFQs is that a fishery might be closed before all vessels had obtained their allowable harvest. Additional management areas that need to be addressed under a proposed buyback plan are:

- Will the retired pots be given to the remaining vessels or will pots effectively be retired.
- How will this affect season length? Management may get an extended season length.
- Overall pot numbers still need to be addressed.
- Race for fish still goes on and is costly.
- ITPQs or IFQs still may be implemented.
- Cost reduction with buyback may move OY closer to MSY as costs are reduced.
- Will the least effective vessels be dropping out thus not effectively reducing total effort (C.R.A.B. tries to assure this will not be the case).
- Others?

Chionoecetes bairdi Tanner Crab

1997 Mature Biomass Minimum Stock Size Threshold

64.2 million lbs. < 94.8 million lbs.

Components of Proposed Rebuilding Plan(s ?)

Stock Definition

- Two stocks ? Bristol Bay & Pribilof Islands.
- E. & W. of 167 - 168° Longitude
 - Genetic Evidence
 - Growth & Size at Maturity
 - Distribution

Stock Modeling

- LBA and CSA Models of Abundance
- Molting Probability and Terminal Molt
- Stock Recruitment Model
- Harvest Strategies
 - Two Constant Harvest Rates – Old & New Shell
 - Thresholds - No Fishing & Δ Harvest Rates @ Rebuilt

Stock Management

- Abundance by Shell Condition * Harvest Rates = GHL
- Size limit(s), Concurrent Openings/Bycatch Only
- PSC
 - New Zones - Stock Distribution
 - Limit - Abundance

Alaska Fisheries Conservation Group

Bering Sea Crab Vessel Owners from Washington, Oregon and Alaska

P.O. Box 910 Woodinville, WA 98072

(425) 488-7708

Fax (425) 823-3964

Existing Guidelines for Determining the Optimum Size Of the BSAI Crab Fleet

Analysis of Proposed License Limitation Amendment Package

August 21, 1998

participation in Norton Sound does not count toward the recent participation criteria, then they may lose their LLP qualification.

Because of the situations described in the previous paragraphs, it appears reasonable to assume that participation in the Norton Sound fishery will be applied toward recent participation criteria. As it takes final action on Proposed Action 5, the Council is advised to verify that this is indeed its intent. Although the analysis does not include Norton Sound participation data, it assumes that they will be included in the actual implementation process and that an incremental number of additional vessels may in fact qualify in non-Norton Sound areas because of that participation.

7.1.6 Severability and the Crab Vessel Buyback Program

The MSFCMA provides for the development of an industry-funded license buyback program in the BSAI crab fisheries. Members of the crab industry have been considering a buyback program since the original Crab LLP was approved by the Council in 1995. The intent of the buyback program would be to further reduce the numbers of licensed vessels. Developers of the buyback program have indicated that they believe the licensed fleet should be reduced to approximately 200 vessels. Under the alternatives in Proposed Action 5 the number of vessels licensed to participate in the crab fisheries would be reduced relative to the status quo. A reduction in the number of vessels initially issued licenses might improve the likelihood that an industry-funded buyback would be feasible. However, the fact that groundfish and crab licenses are non-severable means that technically the buyback program would have to purchase both a crab license and a groundfish license in order to buy back the license of an owner whose vessel qualifies in both fisheries. Therefore, the Council may wish to add language to the severability provisions in the LLPs allowing groundfish and crab licenses to be severed if the crab license is tendered and purchased in a buyback program.

AFCG's "Recent Participation" Preference: Alternative 5, 7 or 8

STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

DIVISION OF COMMERCIAL FISHERIES

TONY KNOWLES, GOVERNOR

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JUNEAU, ALASKA 99802-5526
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September 25, 1998

Mr. A. Dennis Austin
Washington Department of Fish and Wildlife
600 Capitol Way N
Olympia, WA 98501-1091

Dear Mr. Austin:

Thank you for your letter dated August 13. Dennis, I will provide you with an overview of our length-based analysis (LBA) and female reproductive status, because I realize that you may not have benefited from previous documentation, correspondence, and discussions on this topic. As an additional source of information, I have enclosed our 1998 stock status report that provides more details including a recent comparison of LBA and NMFS survey results.

The LBA of the Bristol Bay red king crabs tracks the National Marine Fisheries Service's area-swept estimates very well, and it accurately characterizes the status of the resource. Over the years, annual LBA estimates of abundance are above the area-swept estimates half of the time and below half of the time. This is to be expected, as conditions change annually and there is a matter of chance that particular crab aggregations will be caught or missed by the trawl gear. It is not uncommon for mean abundance from trawl survey data to indicate a sudden increase of one portion of the stock that cannot be substantiated with prior and subsequent years of survey data. The LBA has the advantage of providing an objective framework with which to separate survey measurement errors from true population changes.

Regarding female reproductive condition, estimates from the LBA and NMFS survey data are not exactly equivalent and it is misleading to compare them for a given year. In our LBA, we attempt to estimate the total number of females > 89 mm carapace length (CL) that was fully mated in a particular year. For management purposes, females > 89 mm CL are considered mature based on the long-term average size of 50% maturity of females. Some females > 89 mm CL are immature and some are mature but have not been mated. Some females < 90 mm CL are also mature but are not considered within the LBA model or as a measure of mature female abundance for management purposes. According to the 1997 NMFS survey data, 91 % of mature females of all sizes had new egg clutches. The LBA makes no similar calculation because it does not include females < 90 mm CL. The NMFS data show that 77.7% of females > 89 mm CL were mated while the LBA estimates that 80% of them were mated. When comparable data and

definitions are used, the percentage of fully mated females estimated by the LBA is slightly higher than the NMFS survey data. Thus, the dispute about 1997 results is primarily caused by a misunderstanding about the methods, data and terminology. Regardless, please note that there were absolutely no implications of the methods or results on the harvest quota in 1997.

It is understandable that some fishers may be disappointed in years when our assessment of stock status happens to fall below the area-swept estimate. However, our goal is to maintain healthy stocks and to rebuild depressed populations by coupling our LBA assessments with a conservative harvest strategy. Our scientific approach was described in several scientific papers that were reviewed and accepted by internationally respected scientists prior to publication in professional fishery journals. The LBA and harvest strategy was approved by the Alaska Board of Fisheries and endorsed by the North Pacific Fishery Management Council. As indicated in the enclosed letter from Steve Pennoyer to Rick Lauber, the joint staffs of NMFS-ADF&G continued to support this strategy at a meeting in Juneau on March 9, 1998. More importantly, it is our observation that the majority of the industry supports our approach, as well. We hope that you agree.

Sincerely,



Gordon H. Kruse, Ph.D.
Marine Fisheries Scientist

cc: David Witherell
Robert S. Otto
Peggy Murphy
Robert Mace
Richard Lauber
Dave Fluharty

Enclosures



UNITED STATES DEPARTMENT OF COMMERCE
 National Oceanic and Atmospheric Administration
 National Marine Fisheries Service
 P.O. Box 21668
 Juneau, Alaska 99802-1668

APRIL 1998
 Supplemental

March 19, 1998

RECEIVED

MAR 26 1998

N.P.F.M.C

Mr. Richard Lauber
 Chairman
 North Pacific Fishery Management Council
 605 W. 4th Avenue, #306
 Anchorage, AK 99501

Dear Rick:

At the Joint Meeting of the Alaska Board of Fisheries and North Pacific Fishery Management Council meeting held in Anchorage on February 3, 1998, we indicated that appropriate staff would be meeting to discuss crab management issues. National Marine Fisheries Service (NMFS) and the Alaska Department of Fish & Game (ADF&G) staff met on Monday, March 9, 1998 in Juneau to discuss the current status of the Bristol Bay red king crab stock and its management. The following topics were reviewed and discussed:

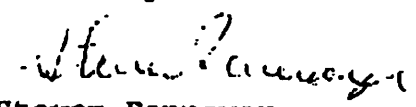
1. Methods of assessing and modeling abundance including the NMFS Bering Sea/Aleutian Islands trawl survey, fishery monitoring, and the ADF&G length-based analysis (LBA) model.
2. Methods of assessing reproductive potential and options for future refinement in these assessment methods.
3. Harvest strategy and historic exploitation rates.
4. The stock rebuilding plan and its premises.
5. The stock's historical and current habitat use and the ecological and environmental conditions.

While minor differences in opinion exist relative to these topics, both staffs were in absolute agreement that low exploitation rates were justified by current stock conditions and necessary to achieve the goal of rebuilding stock abundance under risk-averse management policies. The combined staff also agreed that existing mechanisms in the State/Federal Action Plan for Management of Commercial King and Tanner Crab Fisheries (October, 1993) provide for sufficient coordination of research efforts and scientific review to aid in the development of fishery management policies. These existing interagency mechanisms include a Research Planning Group, the Crab Plan Team, and a State/Federal Policy Group. In addition, NMFS and ADF&G staff meet with industry and the Pacific Northwest Crab Industry Advisory Committee on an annual basis.



We do not believe a need exists to alter current management strategies or policies. NMFS and ADF&G staff will continue to coordinate to address crab research management and policy issues and have reaffirmed the need to meet annually to resolve these issues.

Sincerely,


Steven Pennoyer
Administrator, Alaska Region
NMFS


David Benton
Deputy Commissioner
ADF&G

cc: Alaska Board of Fisheries
PNCIAC
Alaska Fisheries Conservation Group
Alaska Crab Coalition
United Fisherman's Marketing Association