



Alaska Department of Fish and Game

Board of Fisheries

PO Box 115526

Juneau, AK 99811-5526

(907) 465-4110

www.adfg.alaska.gov

## ALASKA BOARD OF FISHERIES

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ALASKA BOARD OF FISHERIES  
Findings for Bering Sea Tanner Crab Management Plan  
Incorporating a New Harvest Strategy  
99 - 188 - FB

The Board of Fisheries considered a new harvest strategy for Bering Sea/Aleutian Islands (BSAI) Tanner crab (*Chionoecetes bairdi*) under Proposal 281. The Board took staff reports, heard public testimony and Fish and Game Advisory Committee reports, and then submitted this proposal to Committee A for discussion and recommendations.

Two written staff reports were submitted as supporting documentation for this proposal: "Bering Sea Bairdi Tanner Crab Fishery, 1998" (RC4, Tab 4) by Rance Morrison, and "Overview of Population Dynamics and Recommended Harvest Strategy for Tanner Crabs in the Eastern Bering Sea" (RC4, Tab 18) by Jie Zheng and Gordon Kruse.

Two oral staff reports were presented relevant to this proposal: "Stock and Fishery History and Current Status of Tanner Crabs in the Eastern Bering Sea" (RC4, Tab 31), by Gordon Kruse, Rance Morrison and Jie Zheng, and "Review of harvest strategies for Tanner crabs" (RC4, Tab 33) by Gordon Kruse, Dan Urban and Jie Zheng. ADF&G Staff Comments were presented in RC 4, Tab 37, and Page 8. The advisory committee comments (RC 110), public comments (RC 69, 85, 102, 111), staff comments (RC 4, Tab 37), and record copies (RC 102) related to the various proposals are identified in attachments to the committee report.

This proposal intended to establish a Tanner crab management plan for the Eastern Bering Sea Subdistrict of Area J. The plan is intended to improve fishery management by linking harvest rates to changes in stock productivity indexed by recruitment strength. Higher harvest rates are applied during an upward recruitment cycle and lower harvest rates are applied during a downward recruitment cycle. Moreover, a threshold is established below which no fishing is allowed to protect the breeding population. These features foster the rebuilding of the Eastern Bering Sea Tanner crab stock that was classified as "overfished" by the Secretary of Commerce in March 1999 under the federal Fishery Management Plan. There are seven key points to the harvest strategy, as described below.

- (1) Establish a threshold level of abundance of 21.0 million pounds of mature (>79 mm carapace width) female Tanner crab biomass. The commercial fishery for Tanner crabs in the Eastern Subdistrict of the Bering Sea District may open only if an analysis of preseason survey data indicates that the population has met or exceeded this index of abundance. The commercial fishery for Tanner crabs in the Eastern Subdistrict of the Bering Sea District will not open if preseason survey data indicates that the population is below this index of abundance. The public asked for clarification of definitions of several terms related to the proposal. They asked the Department to indicate in what years would the Tanner crab season have been closed under this

plan. The department indicated that the fishery would have been closed in 1985, 1986, 1996, 1997 and 1998, if this plan had been in effect.

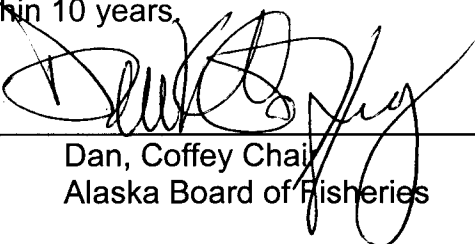
- (2) Establish a 4.0 million pound minimum threshold level for any harvest occurring incidental to the Bristol Bay red king crab fishery and in any directed Tanner crab fishery in the area east of 168° W. The department stated that this level was indicated on the basis of harvest levels that were manageable as bycatch in the Bristol Bay red king crab fishery. The public was concerned about why this harvest strategy utilizes mature female biomass rather than number of animals in calculating threshold levels. The department stated that this was due to the fact that reproductive output and, ultimately, recruitment to the fishery is more closely related to parental biomass rather than number of animals.
- (3) Establish the exploitation rate when the stock is greater than or equal to 21.0 million pounds of mature female biomass but less than 45.0 million pounds of mature female biomass. In this case the harvest rate will be 10% of the molting mature male abundance or 50% of the exploitable legal size male abundance, whichever is less. The public asked the Department to define legal size (5.5" width or greater) and molting, mature males (100% of newshell and 15% of oldshell crabs 113 mm or greater width) as well as exploitable legal size males (100% of newshell and 32% of oldshell crabs 5.5" or greater in width). The department also explained that the National Marine Fisheries Service annual trawl survey is used to collect data for abundance estimation using a length-based analysis (LBA) model. Public suggested that perhaps the 50% cap on legal male harvest mentioned above is too high and that perhaps 20-30% would be more appropriate.
- (4) Establish the exploitation rate when mature female biomass is equal to or greater than 45.0 million pounds. Under this scenario, the harvest rate is set at 20% of the molting mature male abundance or 50% of the exploitable legal size abundance, whichever is less. The public asked why the maximum allowable harvest rate is greater for Tanner crabs than for red king crabs in Bristol Bay. The department stated that this is due to differences in rate of reproduction, mortality, and biology of the two species. The public also asked how this harvest rate compares to those utilized in prior fisheries. The department responded that this is generally a lower harvest rate, except that it is higher when the stock is increasing in abundance. The public indicated its support for this part of the strategy.
- (5) Establish separate guideline harvest levels for both sections of the Eastern Bering Sea Sub-District based on the respective abundance of animals in those areas. The western portion is between 168° W. long. to 173° W. long., and the eastern portion is defined as waters east of 168° W. long. Based on the respective abundances of molting mature male crabs, the guideline harvest level for the Eastern Subdistrict of the Bering Sea District would equal

the sum of the guideline harvest levels for the areas east and west of 168° W. long. if both areas are opened to fishing. This language was supported by industry.

- (6) Add a provision dealing with the situation when any portion of the Eastern Sub-District is reopened to fishing after being closed to all commercial fishing due to low abundance in the preceding season. The reopening will occur when one-half the computed GHL is greater than or equal to four million pounds. If the fishery remains closed because the calculated GHL does not reach 4 million pounds due to a precautionary 50% reduction, then the following season may open if the calculated GHL is at least four million pounds. There was some public confusion as to when a fishery could occur under this scenario, so the Department clarified that the 4.0 million pound threshold need only be reached one year for a fishery to occur the next year.
- (7) The final part of the strategy states that the Department will consider the reliability of the estimates, the manageability of the fishery, and other factors necessary to be consistent with the sustained yield principles, and the best scientific information available. There was support for this section. The public asked how the harvest strategy fit in to the federal Fishery Management Plan's requirements for rebuilding the Eastern Bering Sea Tanner crab stock. The Department stated that the harvest strategy is one of three parts; the other parts are by-catch reduction measures and habitat protection. To describe these requirements, RC 104 was introduced.

In considering staff reports, the status of the resource, and committee and public support for the proposal, the Board of Fisheries adopted the proposed new harvest strategy including all seven points listed above. This adoption was made in the belief that this harvest strategy has a rebuilding capability that complies with federal requirements to rebuild the Eastern Bering Sea Tanner crab stock to levels capable of supporting maximum sustainable yields within 10 years.

ADOPTED: 10/29, 1999  
Fairbanks, Alaska

  
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Dan, Coffey Chair  
Alaska Board of Fisheries

VOTE: 60-1  
one abstention

Bering Sea - Aleutian Islands  
Crab Fisheries  
Pot Limits

(Previously) Finding # : FB - 5 - 92)  
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Alaska Board of Fisheries  
Bering Sea/Aleutian Islands  
Crab Fisheries Pot Limits Finding

The Alaska Board of Fisheries (Board) met March 3-5, 1992 in Anchorage at the Anchorage Hilton Hotel to discuss gear limitations for Bering Sea/Aleutian Islands (BS/AI) king and Tanner crab fisheries. The Board had generated an agenda change request on March 20, 1991 to hear this issue out of cycle, in response to a request submitted by the industry. This request was supported with preliminary Alaska Department of Fish and Game (ADF&G) data which indicated that the levels of gear deployed in these fisheries were creating conservation and management difficulties.

The March 1992 public meeting was publicly noticed consistent with Alaska Administrative Procedures Act and well attended by members of the industry and other concerned parties (Fishery Management Plan for the king and Tanner crab fisheries in the Bering/Aleutian Islands (FMP) Sec. 7.2.6., 9.2). In addition, representatives from the National Marine Fisheries Service (NMFS), the North Pacific Fishery Management Council (NPFMC), State of Alaska Attorney General's Office (AG), the ADF&G and Fish and Wildlife Protection were in attendance. The AG representative maintained communications with NOAA General Counsel during the proceedings.

The Board considered the following reports and presentations prior to their deliberations.

1. Bering Sea/Aleutian Islands (BS/AI) Shellfish Fisheries and Gear Utilization (Ken Griffin, ADF&G).
2. Norton Sound Harvest Evaluation (Charles Lean and Fred Bue, ADF&G).
3. Review of Existing Regulations, Gear Loss and Pot Usage in BS/AI (William Nippes, ADF&G).
4. Economic Impacts of Alternative Pot Limits to Bristol Bay Red King Crab and Bering Sea C. opilio Fishermen, Executive Summary (27 pp) and draft document (115 pp.) (Dr. Joshua Greenberg, University of Alaska-Fairbanks  
Dr. Mark Herrmann, University of Alaska-Fairbanks  
Dr. Paul J. Hooker, ADF&G/NOAA).
5. Report illustrating the State/Federal responsibilities frameworked in the FMP, and evaluation of the Crab Fisheries by Type-Indicating Options for Management Within the FMP process (Dr. Ray Baglin, NMFS and Earl Krygier, ADF&G).

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6. Overview of FMP Criteria and Magnuson Act  
(Bonnie Harris, Alaska Attorney General Office).
7. Enforcement Considerations and Options for Crab Pot Sticker Identification (Captain Phil Gilson, Division of Fish and Wildlife Protection).

The Board considered public testimony from over 30 individuals, industry representatives and organizations, plus Advisory Committees, representatives from the Pacific Northwest crab industry, Dutch Harbor, and Kodiak.

Public input was also incorporated into the Board's decision by the formation of a ten member committee whose composition represented large and small vessel owners and operators, processors and catcher processors. Members were: Kevin Koldestad, Phil Chitwood, Dick Powell, Chris Fanning, Louie Lowenberg, Earling Skar, Jerry Nelson, Bart Eaton, Larry Hendricks, Peter Liske, and Jack Hill. As the Board weighed alternatives for management, this industry group was able to comment and respond. It is noteworthy that the Board took no action on issues/fisheries that were substantially advised against by this group.

During public testimony, many people expressed concern that the imposition of pot limits in these fisheries, in the absence of a vessel limitation, would be an exercise of questionable value. The Board acknowledged their concern. However, they clarified to the public that under the FMP (8.1), a moratorium decision is solely the authority of the NPFMC. The State can not limit entry into the fisheries of the EEZ. The BOF informed the public that, considering the magnitude of the problem at hand, and the fact that the NPFMC's moratorium may not provide a solution, the BOF would address this conservation issue within the regulatory avenues available to them.

Board scheduling was also an issue which emerged during public testimony. It is understood that BS/AI crab fisheries will be before the Board in their entirety February of 1993 (FMP 7.2.6). With this in mind, the Board had the option to defer any action until that time, or could choose to implement some program of gear restrictions for the 1992/1993 season and look to refining or redesigning it, if necessary, in 1993.

Under status quo, goals and objectives of the FMP are not being met or are in jeopardy, therefore the current conduct of the fishery is inconsistent with these goals and the National Standards of the Magnuson Act (FMP Chapter 7 and Appendix B). The Board found the following facts identified in staff reports and through public

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testimony to be specific issues of concern:

1. The Bristol Bay king crab fishery was identified as a high value, high effort fishery in which increases in the number of vessels and pots, combined with moderate Guideline Harvest Levels (GHLs), have led to derby-style fishing with increasingly shorter seasons which are increasingly more difficult to manage in-season.

This fishery is being conducted on a rebuilding stock which dictates conservative management. Since the 1983 closure of the Bristol Bay red king crab fishery due to depressed stocks, the fishery has started a slow recovery and is the only Bering Sea red king crab fishery to re-open after a closure.

In the Bristol Bay red king crab fishery, the following historic performance data indicate the trend of the fishery to increased effort since reopening in 1984:

	1984	1991
Season Length	15 days	7 days
Number of Vessels	89 vessels	302 vessels
Harvest in millions/lbs	4.1 mil/lbs	17.1 mil/lbs
Number of Pots	21,762 pots	89,068 pots
Number of Pot Lifts	112,556	227,555

Although the presence of observers on catcher-processor vessels has allowed better estimates of in-season harvest, effort relative to GHL continues to increase at a rate which jeopardizes the ability of management to prevent overfishing. In 1991, the catching ability of the fleet was estimated at over 2 million lbs/day. Actual harvest indicated a rate in excess of 2.4 million lbs/day.

Extending season lengths in the future was identified to the Board as an important management objective with respect to this fishery. The ADF&G staff indicated to the Board that an optimal season length would be at least two weeks in length. This would allow for in-season adjustments to GHL to reflect CPUE information which can validate or invalidate preseason stock estimates. Seasons shorter than two weeks increase the probability of over or under harvesting the resource.

2. The Norton Sound red king crab, Pribilof Islands red and blue king crab, and St. Matthew blue king crab were all identified to the Board as fisheries that would not likely occur, despite the presence of a harvestable surplus, due to the currently

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uncontrolled fishing capacity. The potential level of effort was so high in relation to GHF, that the ability to manage these fisheries and prevent overfishing had been lost.

3. Fast moving ice conditions in C. opilio fisheries have been causing excessive pot loss which results in intolerable levels of increased crab mortality and habitat degradation.

The Board heard repeated public testimony that the department estimate of 100,000 pots on the Bering Sea grounds in 1991 was low and that actual pots on the grounds likely numbered in excess of 120,000.

Industry non-compliance with minimum cotton twine size in the biodegradable escape panel was reported to be widespread by both Fish and Wildlife Protection and industry; this exacerbates mortality associated with lost pots.

Testimony from fisherman, confirmed with survey information, indicated crab are not evenly distributed over the fishing grounds; rather they are found in concentrated amounts in discrete areas. Thus, once crab locations are determined, intensive gear deployment occurs in those areas. Sheer numbers of pots on the grounds have exacerbated gear conflicts, increasing gear loss and creating conflicts over grounds pre-emption. Density of buoys and floating lines creates a hazard to navigation to the conscientious vessel operator. The Board heard repeated testimony that gear is so dense that it is difficult to operate vessels in a manner that will not run over gear and cause increased pot losses. Lost pots continue to capture and kill crabs. Such fisheries can no longer be identified as orderly.

Additionally, lost pots conflict with activities of bottom trawl fishermen, thereby increasing the trawlers costs of operation and decreasing their fishing efficiency.

Public testimony indicated that historically, fishery execution relied on a combination of luck, skill, and experience in finding crab and keeping gear on them. This style of fishing has been replaced by a new style of fishing in which large areas are saturated with gear. The Board heard testimony to the effect that large numbers of pots are being abandoned or not maintained by vessel operators, a condition not previously seen in the fishery.

Only three individuals testified during public testimony against adopting gear restrictions in the form of pot limits. Every other vessel owner, operator, processor and catcher processor present and testifying, supported some concept of pot limits. Support for pot limits was qualified by whether or not an enforceable program could



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be implemented, and most fishermen wanted an avenue whereby lost pots could be replaced.

The Board began deliberations with these identified concerns in mind. The industry committee was appointed and the Board reviewed the following management options with their input. In part, the board considered the following:

1. Close fisheries where status quo did not allow prevention of over fishing. This option was rejected. Industry and Board would rather see change to allow utilization of harvestable surplus.
2. Change dates of fisheries to force redistribution of effort. Rejected as a management option available at this meeting since public notice spoke specifically to pot limitations. Identified as a management option to be considered in February 1993.
3. Imposition of trip limits. This option was rejected. Opposed by segments of industry as counter-productive to free market and competition in fisheries. Identified as an option for future consideration, especially if tied to vessel length.
4. Exclusive or super-exclusive registration areas. Identified as an option for action at this meeting, but did not receive much industry support. Board expressed concern that the written findings, including an economic analysis, required in FMP 8.2.8 would be difficult to generate within time constraints of the meeting. Rejected as option for this meeting.
5. Determine GHL for fishery, require vessels to pre-register; divide GHL among participants evenly or use a sliding scale. A variation of #3 above, this was also rejected for lack of industry support.
6. Proportional pot limits based on vessel length. The Board engaged in an extensive discussion of this topic. The impacts of a fixed versus a proportional limit were weighed in terms of enforceability, discrimination between vessel classes, and achievement of FMP objectives. The Board rejected this option and specifically discussed:
  - A. The Board found that the pot limits which require buoy stickers and affidavits signed by the crew and skipper for replacement of lost pots (stickers), were enforceable. They noted that a fixed limit would be more easily enforced, since all participants would have the same

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number. Beyond that, the Board found that proportional limits presented no distinct enforcement difficulties different from those which might be encountered in a straight fixed pot limit program.

- B. Proportional limits might achieve FMP objectives as well as fixed limits, but several Board members felt the 4th standard of the Magnuson Act could be violated by imposition of proportional limits. They felt that proportional limits could be discriminatory in assigning varying levels of fishing capacity to individual vessels. On the other hand, fixed pot limits provided equal opportunity for all fishermen; treating the crab fleet as a whole and providing equal access to the fishery, and the harvest, for all vessels equally.
- C. The Board found that a pot limit based on vessel size would not be less discriminatory than a fixed pot limit for all participants for the following reasons:
  - i. Larger vessels will still maintain a competitive advantage under a fixed pot limit; since they carry more pots. For example, some vessels can carry a full compliment of 250 pots safely in all weather conditions. They are advantaged over a smaller vessel which must make multiple trips to move the same number of pots. This, combined with their greater speed and larger crews, allows them to deploy their gear over productive fishing grounds more effectively.
  - ii. ADF&G information indicated that the numbers of pots fished by vessels greater than 90 ft., which most full-time crabbers have, do not track robustly with vessel length. (see attached Fig. 4)
  - iii. Presently, small and medium size vessels utilize wet storage areas to allow them to deploy a large number of pots if they choose to fish in this manner.
  - iv. Presently, vessels are provided very liberal hours to deliver their catch to port after a season closure. This allows small and mid-sized vessels to remain competitive by fishing large numbers of pots despite weather variables.
  - v. Some large vessels are able to fish smaller numbers of pots competitively due to skill and experience of operators.

- vi. Data presented in the Economic Impacts Study Draft document, for years 1986-1990, forecast that fixed pot limits may pose some disproportional impacts to the largest vessels, but that vessels in every size category are impacted. But in contrast to the forecast model, experience with the Kodiak Tanner crab pot limit indicates that under a fixed pot limit larger vessels maintain their competitive advantage over smaller vessels.
  - vii. Public testimony indicated that a minimum pot soak time of 18 - 24 hours was required to reach acceptable harvest levels. Since even the largest vessels do not normally turn over 250 pots within a 24 hour period, no vessel would be restricted to unacceptable soak times while constantly working their gear. Since this is not optimal soak time, two outcomes occur: 1) in the red king crab fishery it is anticipated that vessels would move to optimize their soaks and thus extend the fishery; 2) in the C. opilio fishery, turning gear at a normal rate, CPUE would drop to a level which would facilitate sorting and releasing live sublegal C. bairdi crab.
7. At this point, the Board determined fixed pot limits would be the preferred management alternative to discuss with industry. The Board then focused its discussion on determining the appropriate number of pots to apply to the Bristol Bay red king crab fishery.

For discussion purposes, after input from the industry committee, the Board adopted 250 pots per vessel as a reasonable number to focus on.

The Board engaged in a lengthy discussion of enforcement issues and found the following:

- A. An important benefit of imposing any fixed pot limit would be to generate accurate numbers of how many pots are actually being fished and how many pots are actually being lost. Industry saw that attainment of real numbers would greatly improve ADF&G's ability to determine the catch per unit effort.
- B. A sticker program enforceable from the surface of the water could be implemented consistent with existing state regulations.

- C. Replacement of lost pots could be provided for in the 1992/1993 fishery.
- D. Division of Fish and Wildlife Protection may experience difficulty proving cases if replacement pots are allowed. The Board considered non-replacement of lost pots and double sticker requirements. However, the Board found that hardship to industry by not providing some replacement program would be unnecessarily burdensome, especially in light of a first year program of gear limitation. Special conditions regarding replacement were included to accommodate the concerns of Fish and Wildlife Protection. The Board, at the recommendation of Fish and Wildlife Protection, rejected the double sticker standard.
- E. Board discussed the manner in which it could provide for pots fishing cod for bait. There may be future need for coordinated regulation or cod pot definition between NPFMC and the Board.

In their final summations, Board members found that establishment of 250 fixed pot limit for the Bristol Bay red king crab fishery would be desirable for several reasons. In addition, this management option would be consistent with Magnuson Act standards and would achieve objective of FMP in the following ways:

1. Pot limits would likely lengthen season and would provide for greater management precision and prevent over harvest of stocks.
2. Pot limits would decrease crab mortality by increasing incentive to retrieve lost gear.
3. Pot limits would allow for greater level of maintenance of gear in terms of better quality lines and buoys, thereby decreasing pot loss.
4. Pot limits will result in greater ability to maintain biodegradable twine, thereby decreasing crab mortality due to ghost fishing of lost pots.
5. Pot limits encourage vessel operators to fish more efficiently thus decreasing capitalization costs relative to value of harvested species.
6. Pot limits will minimize gear conflict within and between fisheries.

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7. Pot limit of 250 is an appropriate level which will not result in a significant increase in mortality due to handling relative to increased pot limits, when weighed against the savings in crab mortality presently incurred by the lost pot problem.
8. Pot limit of 250 is the mid-point of the range of values considered in the economic study, and is close to the 275 pots per vessel average currently being fished.
9. With the exception of a representative of the catcher processor fleet, the industry committee indicated they could "live with" a 250 pot limit.
10. Pot limits with the pot sticker requirements and with the special replacement conditions can be enforceable, but it may take time to work out ideal implementation.
11. Pot limit of 250 would not unduly discriminate against any component of the fleet and should not result in a reallocation of harvest between historic components of fishery to a significant degree.
12. Pot limit of 250 for Bristol Bay red king crab will result in a more orderly fishery.

With respect to C. bairdi, the Board discussed whether similar concerns existed in that fishery which were identified in the red king crab fishery. Hearing that this was indeed the case, and with concurrence of the industry committee, the Board extended the 250 pot limit to the Bering Sea C. bairdi Tanner crab fishery as well. Similar administrative procedures for the stickers and replacement were also approved.

Moving to the Bering Sea C. opilio fishery, the Board found the following identified concerns.

1. The fishery is distinguished by fast moving ice conditions which are causing, in some years, intolerably high levels of pot loss which degrade habitat and increase crab mortality and gear conflicts (pot and trawl fisheries).
2. If pot limits are implemented, they would cause greater vigilance in gear placement and would decrease the number of pots being lost.

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3. Pot replacement should be provided for under special conditions to accommodate Fish and Wildlife Protection's concerns.

The Board found that benefits of this limit are similar to those of the Bristol Bay red king crab fishery but recognized increasing season length as not the compelling reason necessary in this fishery at this time. The Board also found that benefits outweigh projected hardship to industry. However, if during their review at the 1993 Board meeting they find Board objectives are not met under this regime, the Board can take corrective measures based on information available and industry recommendations.

After lengthy discussion with the industry committee and among itself, the Board chose to apply the 250 pot limit to the Bering Sea C. opilio fishery, for the 1992-1993 season.

The Board considered the Norton Sound red king crab, Pribilof blue king crab, and St. Matthew blue king crab fisheries and established a 100 pot limit for each, based upon the following reasons:

1. Industry support for fixed limit, over any other option reviewed during the red king crab fishery discussion.
2. Department recommended a 50 pot limit, but the Board liberalized this to decrease possible handling mortality which would occur through increased pot lifts.
3. Those fisheries would have remained closed, or have been closed, if a pot limit was not instituted.

In 1993, the Board may revise this level downward or consider other options if overfishing occurs in 1992/1993.

Regulations for the remaining Bering Sea/Aleutian Island crab fisheries (Dutch Harbor and Adak) remained status quo, as the Board found no pressing concerns requiring regulatory change for those fisheries at this time.

*Michael L. Martin*  
Mike Martin, Chair  
Alaska Board of Fisheries

Vote: 7 yes

Adopted: October 25, 1992 at Soldotna, AK

Attachments:

A:\LIMIT2.CRB [10/25/92 @ 1:53pm]

# POLICY ON KING AND TANNER CRAB RESOURCE MANAGEMENT

## GOAL AND BENEFITS

It is the goal of the Alaska Board of Fisheries and the Alaska Department of Fish and Game to manage king and Tanner crab stocks in a manner that will protect, maintain, improve, and extend these resources for the greatest overall benefit to Alaska and the nation. Achievement of this goal is necessarily constrained by the requirement to minimize: (1) risks of irreversible adverse effects on reproductive potential; (2) harvest during biologically sensitive periods of the life cycle; (3) adverse fishery impacts on non-targeted portions of stocks; and (4) adverse interactions with other fish and shellfish stocks and fisheries.

Management of these fisheries for the purpose of achieving this goal will result in a variety of benefits which include, but are not limited to, the following:

- (1) maintaining healthy stocks of king and Tanner crabs of sufficient abundance to insure their continued reproductive viability and the maintenance of their role in the ecosystem;
- (2) providing a sustained and reliable supply of high quality product to the industry and consumers which will provide substantial and stable employment in all sectors of the economy relating to these fisheries; and
- (3) providing opportunities for subsistence and personal use fisheries on these stocks.

The Alaska Board of Fisheries also recognizes the benefits of managing for the highest socio-economic benefit when such action does not conflict with the previously mentioned biological constraints.

## POLICIES

To achieve the management goal and provide the benefits available from these resources, it is necessary to set policies which will protect stocks and provide for optimum utilization of these resources. It is the policy of the Alaska Board of Fisheries to:

1. Maintain crab stocks comprised of various size and age classes of mature animals in order to maintain the longterm reproductive viability of the stock and reduce industrial dependency on annual recruitment, which is extremely variable. Benefits of this policy are most apparent when weak recruitment occurs. As population abundance and structure change with declining recruitment, harvests should be reduced.
2. Routinely monitor crab resources to provide information on abundance of females as well as prerecruit, recruit, and postrecruit males. This is necessary to detect changes in the population which may require adjustments in management to prevent irreversible damage to the reproductive potential of each stock and to better achieve the benefits listed above. Harvests must be conducted in a conservative manner in the absence of adequate information on stocks.
3. Protect king and Tanner crab stocks during biologically sensitive periods of their life cycle.

Closure of the fishing season is necessary at times surrounding the annual mating, molting, and egg hatching periods in order to reduce unnecessary mortality of soft animals, disturbance during mating, and damage to egg clutches.

4. Minimize handling and unnecessary mortality of non-legal crabs and other non-target animals. Capture and handling of females, sublegal males, and animals of other species results in a loss of reproductive ability and biomass that may be detrimental to a stock.

5. Maintain an adequate brood stock to rebuild king or Tanner crab populations when they are depressed. Maintenance of an adequate brood stock takes precedence over short term economic considerations. When populations are at or below threshold, the minimum stock size that allows sufficient recruitment so that the stock can rebuild itself, fisheries must be closed and must remain closed until there is adequate brood stock.

6. Establish management measures in each fishing area based on the best available information. Stock and fishery characteristics, as well as available data, vary from area to area within Alaska. Actual management practices in each area will vary accordingly.

7. Establish regulations which will help improve the socio-economic aspects of management by: harvesting crab when their meat yield is highest; providing for fair starts and closures to seasons; insuring enforceability of regulations; and other measures providing for an orderly fishery.

The Board recognizes these policies may not result in maximization of physical or economic yield. They will, however, provide better biological protection and help preserve the reproductive viability of king and Tanner crab stocks which inherently vary in abundance due to environmental conditions. It will also increase the stability and longevity of the king and Tanner crab fisheries beyond that provided by a recruits-only fishery.

## MANAGEMENT MEASURES

The following management measures are available as tools to be used in order to carry out the policies on king and Tanner crab management. Individual measures should be applied as necessary in areas and fisheries depending on available information and fishery characteristics.

1. **Harvest Rates.** Harvestable surpluses available from king and Tanner crab stocks depend on the size and condition of the individual stock. Harvest rates represent the percentage of the legal stock that may be harvested during the biological season in accordance with the goal and policies of the Board.

Exact harvest rates in each situation are chosen based on abundance of prerecruit males and females as well as legal males, the established minimum size or the actual size of crab landed, percentage of females bearing eggs, and the ratio of recruit to postrecruit males. When the acceptable annual harvest rate has been reached in an area, that area must be closed to fishing. Changes in harvest rates should appear in fishery management plans to be reviewed by the public and the Board.

When stock abundance and condition in a management area are such that there is no harvestable surplus, the area or a portion of the area must be closed to fishing. Such areas must remain closed to fishing until the stock recovers to a level WHICH IS EXPECTED TO PRODUCE A SUSTAINED HARVESTABLE SURPLUS.

2. **Size Limits.** Size limits have a dual role in management. They provide some protection against over harvest and also provide for improved product quality. To provide for protection



against over harvest on stocks where harvest rates are unknown or difficult to regulate, size limits are set to increase the probability of mating prior to harvest. For example, in some cases king crab size limits have been set at two average molt increments above the estimated average size at maturity and Tanner crab size limits have been set at one average molt increment above estimated average size at maturity because Tanner crab are known to produce multiple egg clutches from a single mating.

Smaller size limits may be established where stock size is accurately known and harvest rates are precisely controlled since harvest rates will have to be lowered to prevent over fishing.

Larger size limits may be established to insure better marketability of the crab or provide increased long term yield by limiting harvest of animals below a suboptimal size.

**3. Sex Restrictions.** Harvest of king and Tanner crabs is limited to males only in an attempt to provide full fertilization of females and increase the chances of reproductive success. This is particularly important at low stock levels. During periods of average or high abundance, in areas where stock size is accurately known and harvest rates are precisely controlled, this restriction may be eliminated if it is demonstrated that the abundance of females results in no increase in recruitment to the fishery.

**4. Fishing Seasons.** Biological seasons should be set to minimize the harvest of king and Tanner crabs during times surrounding the annual mating, molting, and egg hatching periods and for a sufficient time after molting to allow safe handling and acceptable product quality. Within the acceptable biological fishing season, actual fishing times may be further modified for economic reasons, such as to ensure high meat content of legal males and to reduce dead loss in the landings.

**5. Guideline Harvest Levels (GHL).** A preseason estimate of the level of allowable king and Tanner crab harvest is established for each fishery. In those fisheries with accurate population estimates the appropriate harvest rate is applied to the best point estimate to determine the GHL. For those fisheries without surveys or historical catch information adequate for estimating the population size, the GHL will be set based on historical fishery performance, catch, and population trend.

**6. Closed Areas.** To minimize the handling and unnecessary mortality of non-legal and/or molting crabs, or to prevent conflicts with other fisheries or stocks, it may be necessary to close portions of management areas.

**7. Gear Types.** Fishing for king and Tanner crabs is limited to pots, ring nets, or diving gear depending on area. This type of gear provides the most manageable type of fishery while minimizing potential damage to target and non-target portions of the stock or other species. Biodegradable panels are required in pots to minimize adverse effects of lost gear. Escape rings, large mesh panels, or other measures may be required in gear to meet the policies of the Board.

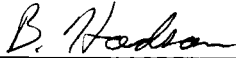
**8. Inseason Adjustments.** Inseason adjustments may be made to the guideline harvest level and length of the fishing season. Information upon which such adjustments are based may include: (1) overall fishing effort; (2) catch per unit of effort and rate of harvest; (3) relative abundance of king or Tanner crabs; (4) achievement of guideline harvest level (GHL); (5) proportion of soft-shelled crabs and rate of dead loss; (6) general information on stock condition including adequacy of reproductive stock; (7) timeliness and accuracy of catch reporting; (8) adequacy of subsistence harvests, (9) THE IMPACT OF SEVERE OR UNEXPECTED ENVIRONMENTAL CONDITIONS ON THE HANDLING AND TRAPPING MORTALITY OF CRAB, AND (10) other factors that affect ability to meet objectives of the policy. When this information shows that continued fishing effort would jeopardize the reproductive viability of king or Tanner crab stocks within a registration area, or continued fishing would be counter to the goal and policies established by the Board, the registration area or a portion of the registration area will be closed by Emergency Order.

9. **Other Measures.** To meet the goal and policies for management of these fisheries, it may be necessary for the Board to adopt additional regulations OR MANAGEMENT MEASURES. CONTROLLING DISEASE, REDUCING HANDLING AND TRAPPING MORTALITY DURING SEVERE OR UNEXPECTED ENVIRONMENTAL CONDITIONS, SPECIFYING registration requirements, tank inspections, gear storage, gear limitations, and other measures including regulation of other shellfish and finfish fisheries may be necessary in order to promote the protection and best overall usage of the king and Tanner crab resource toward the stated goal.

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Anchorage, Alaska

Vote: 7/0

  
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Bud Hodson, Chairman  
Alaska Board of Fisheries