On-Time Public Comment List

Bering Sea Tanner Crab Harvest Strategy | May 17-18, 2017

From Statewide King & Tanner Crab Meeting, March 20-24, 2017

From Kodiak Finfish Meeting, January 10-13, 2017

From April-May 2017 comment period

RC 055

Draft board proposal:

Re-examine the Tanner crab harvest strategy, including the following elements, for review and action at a Board of Fisheries meeting in early June. Elements of the strategy under #1 below are the highest priority for action prior to the 2017/2018 season. The review should also include a discussion of the appropriateness of a female threshold in light of other female conservation measures (e.g., male only fishery, no fishing during mating/molting), and as compared to other Tanner crab fisheries. The review should also include a description of all of the additional conservation measures currently in place.

1. Female threshold computation
    a. Evaluate the designation of female maturity determination for existing calculation
    b. Evaluate the inclusion of crab west of 173° and/or other areas not currently included in the biomass estimate but for which survey data are consistently available
    c. Evaluate using the same reference years as in the federal stock assessment
    d. Penalty clause – re-evaluate the utility of the TAC penalty the following year
    e. Consider alternatives to a single open/close threshold (i.e., alternatives to the on/off switch to facilitate flexibility)
    f. Male threshold – consider upper male threshold to determine harvestable surplus

The Board supports continued assessment of the following issues, recognizing that these are part of a longer-term effort and would likely not be included in the evaluation provided to the Board this summer.

2. Consider using selectivity data from the stock assessment
3. Consider using stock assessment model outputs as the basis for the harvest strategy
4. Evaluate existing additional conservation buffers (new shell/old shell selectivity)
5. Evaluate alternative measures for the female abundance threshold (e.g., fertilization rate; egg production index; effective spawning biomass; total mature biomass)

The Board encourages the Department to update the Crab Plan Team at its May meeting and present the draft results of the potential harvest strategy revisions.

Edward Poulsen

ALASKA
Bering Sea Crabbers

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alaskaberingseacrabbers.com

Alaska Board of Fisheries
P.O. Box 115526
Juneau, AK 99811

January 10, 2017

Dear Members of the Board of Fisheries,

On behalf of its membership, approximately 70% of the Bering Sea crab harvesters, this letter is being submitted by the Alaska Bering Sea Crabbers (ABSC) to express our full support for Proposal 278 and to encourage its adoption by the Board. Based on the details below, it is our position that a conservative commercial fishery for C. *bairdi* can be prosecuted in the western district for the remainder of the 2016-2017 season without compromising the sustainability of the C. *bairdi* stock as a whole. We submit this letter as additional information the Board may want to consider as part of its decision-making on Proposal 278.

First, relative to the commercial closure based on the current female threshold contained in C. *bairdi* harvest strategy, newly available scientific information from the Bering Sea Fisheries Research Foundation relative to the NMFS survey and the definition of mature females appears to indicate that mature female biomass is underestimated in 2016. Using recent cooperative survey results to adjust the 2016 NMFS survey estimates of mature female C. *bairdi* would result in a mature female biomass estimate of 9.94 million lbs, exceeding the 9.832 million lb threshold by approximately +1%. A further review of the 2016 side by side results shows that survey stations with a higher abundance of mature female stations have lower selectivity values than survey-wide results. By applying these lower selectivity values across the C. *bairdi* survey area, the estimate of mature female biomass would be over the threshold by approximately +5%. Survey methods have changed across the early portion of the reference period, 1975-2010. Starting in 1982, modification of the trawl net used by NMFS for their annual surveys changed the selectivity of the survey for crab. The existing mature female biomass threshold is biased by higher survey selectivity in the early period (1975-1981) and lower survey selectivity in the later years (1982-2010).

Next, moving away from the current female threshold itself, the proposed change to the C. *bairdi* harvest strategy, as presented in Proposal 278, is not being promoted by industry as a long-term, permanent solution to the multiple concerns with the current harvest strategy that have been raised over the past several months. Proposal 278, as described by the Board last October, provides a mechanism to allow for a conservative western C. *bairdi* TAC for the remainder of the 2016-2017 commercial season with the understanding that the changes in the proposal, once adopted, would expire 120 days later. ABSC is committed to working with the Department towards the development of long-term adjustments to the C. *bairdi* harvest strategy (and the harvest strategies for the other major crab species) in time for the 2017-2018 season. To accomplish this task, and to accommodate ADF&G staff resources and time, we encourage the Board to schedule a summer meeting.

The harvesting sector understands and fully supports that thresholds in harvest strategies address Board policy to "Maintain an adequate brood stock to rebuild king or Tanner crab populations when they are depressed." However, C. *bairdi* is neither depressed nor is it in a rebuilding stage as it was when the female threshold was first adopted. According to the 2016-2017 federal stock status, the C. *bairdi* stock is projected at 177% of BMSY with a mature male biomass of 99.95 million lbs (5th highest throughout the survey time series) and an approved OFL of 56.46 million lbs and ABC/ACL of 45.17 million lbs. By comparison, the 2016-

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2017 federal stock status for C. *opilio* snow crab is projected at 63% of BMSY with a mature male biomass of 201.9 million lbs and an approved OFL of 52.25 million lbs and ABC/ACL of 46.96 million lbs. Per the current ADF&G harvest strategy for C. *opilio*, a TAC of 21.57 million lbs was adopted for the 2016-2017 season.

The harvesting sector appreciates the use of productivity capacity of a stock as a measure of brood stock to establish fishery thresholds, as is able to be done with the model for Bristol Bay red king crab. Absent such a direct or proxy measure of productive capacity, the Department comments state that "mature female biomass provides a better and more direct proxy for spawning biomass or fertilized egg production for establishment of thresholds". The Board should consider, however, that this differs from the harvest strategy for C. *opilio* snow crab, which utilizes both males and females in its threshold determination. Under the Bering Sea C. *opilio* snow crab harvest strategy, a spawning biomass threshold is used (from analysis of preseason survey data and not a model) for opening the commercial fishery. Estimated spawning biomass is defined as the estimated biomass of all morphometrically mature male and all morphometrically mature female C. *opilio* crab. The threshold for opening a commercial C. *opilio* fishery is an estimated spawning biomass of at least 25% BMSY, which is defined as the population of mature male and female C. *opilio* crab that could produce maximum sustainable yield under environmental conditions.

Further expanding upon the productive capacity of the Tanner crab stock, the harvesting sector recognizes that there will be periods where mature female biomass is lower than that of mature male biomass, which can be relatively high. We appreciate ADF&G's precautionary approach, as illustrated in the staff comments, that places emphasis on preserving mature male biomass until such a time when mature female biomass increases and the stock as a whole is no longer considered in a period of low recruitment; however, the current population of large, mature males that are available now will most likely not be available into the future. Unlike king crab, C. *bairdi* (and C. *opilio*) do not continue to grow throughout their lifespan. These animals have a terminal molt to maturity. Large male C. *bairdi* crab that do not molt (old shell) are important in reproduction, but only in the immediate term. Natural mortality of these large, old shell male Tanner crab will most likely prevent them from being available to the mature female population when it increases. Thus, a significant portion of the current population of mature male crab will be incapable of contributing to the future productive capacity of the stock (when the mature female population increases) while also being unavailable to the commercial fishery under a complete closure. Regarding the delineation of mature females necessary for productive capacity, it should be highlighted that the time series estimates of mature female C. *bairdi* from the NMFS annual survey vary significantly depending on how maturity is determined. The actual mature female biomass, as observed onboard the survey based on the condition of the abdominal flap, is significantly higher than the estimate of female maturity defined by terms in the current ADF&G harvest strategy, which uses size cut off values (80 mm and 85 mm). A significant proportion of actual mature females is below these cut off values, and therefore excluded from calculation of the harvest strategy biomass threshold, which significantly underestimates the actual mature female biomass.

Finally, without an available TAC for C. *bairdi*, zero retention of the species is allowed, which will have significant negative consequences upon the 2016-2017 C. *opilio* fishery and upon future stock assessments for C. *bairdi*. Populations of C. *opilio* and C. *bairdi* overlap and interact with one another. A zero retention limit on C. *bairdi* will result in substantial sorting and discarding during the targeted C. *opilio* fishery. Aside from the inefficiency that will be experienced during the C. *opilio* fishery, a discard handling mortality rate of 32% will be applied to all discards of C. *bairdi* in future stock assessments for this species, which will negatively impact future OFL, ABC/ACL, and allowable catch projections for this stock. Such impacts are being felt by a directed fishery that has negligible impact upon the female portion of the population. By

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comparison, the recently adopted 2017 C. *bairdi* prohibited species catch (PSC) allowance for all trawl gear is 2.9 million animals. And unlike the selective harvesting that occurs with directed pot gear, this trawl PSC allowance encompasses the indiscriminate take of males, females, and juveniles of both sexes).

In summary, ABSC thanks ADF&G for their willingness to communicate and engage with stakeholders throughout this process, but we affirm our belief that a demonstrable conservation concern within the C. *bairdi* stock has not been established that warrants a complete closure of the commercial fishery for 2016-2017. As long-time participants in the Bering Sea king and Tanner crab fisheries, our members are actively concerned with and have a significant stake in the long-term health of the resource. We are also actively concerned with future access to the important crab stocks upon which we depend. We encourage the Board of Fisheries to consider all biological and socio-economic factors and to do what is in the best interest of both the resource and the stakeholders. ABSC believes that a conservative TAC for western Tanner crab can be established without threatening either the near- or long-term sustainability of the stock. For all of these reasons, ABSC strongly encourages the Board of Fisheries to adopt Proposal 278.

Thank you for your time and consideration.

Sincerely,

Tyson Fick, Executive Director
Alaska Bering Sea Crabbers

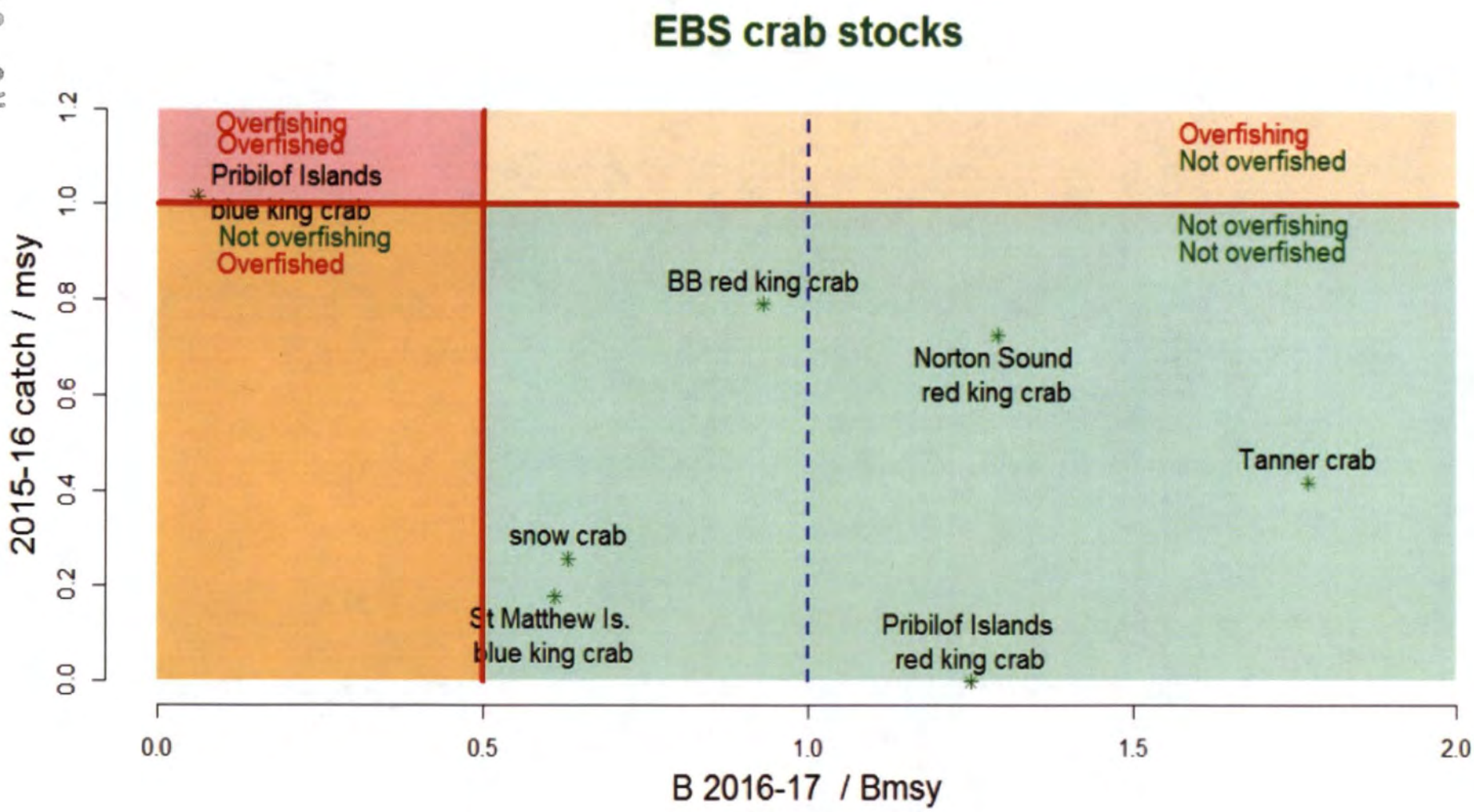

Figure 1. Status of 7 Bering Sea crab stocks in relation to status determination criteria (B_{MSY}, MSST, overfishing). Note that information is insufficient to assess Tier 5 stocks according to these criteria (WAIRKC, AIGKC, PIGKC).

RC 040

Submitted on behalf of Board member Jensen
BY ALASKA BERING SEA CRABBERS

[DRAFT]
ALASKA BOARD OF FISHERIES
FINDING OF EMERGENCY FOR THE BERING SEA TANNER CRAB FISHERY FOR THE REMAINDER OF THE 2016/2017 TANNER CRAB SEASON
2017-xx-FB
January 13, 2017

The Alaska Board of Fisheries finds that an emergency exists and emergency regulations providing for a total allowable catch for the 2016/2017 season in the Tanner crab fishery of 4,000,000 pounds of legal size males in the portion of the Bering Sea District that is west of 166° W longitude are necessary for the immediate preservation of the public peace, health, safety, or general welfare. The facts constituting the emergency include the following:

Economic opportunities for harvesters, processors, and communities dependent on Bering Sea crab resources are limited. Many remote Alaska communities are highly dependent on harvest of Bering Sea Tanner crab resources for their continued well-being. Decreases in crab abundance for other species in recent years have limited economic opportunities for participants in Bering Sea Tanner crab fisheries due to reasons that are beyond the control of those participants.

Bering Sea crab stock assessments are produced and approved in a highly structured, peer-reviewed, and constantly evolving public process resulting in the annual publication of the best available science in the Crab Stock Assessment and Fishery Evaluation (SAFE) Report. The Crab Plan Team (CPT) and Science and Statistical Committee (SSC) are comprised of Federal and State of Alaska scientists that collaboratively produce stock assessments consistent with the fishery management principles defined in the federal Fishery Management Plan for Bering Sea/Aleutian Islands King and Tanner Crabs (Crab FMP). These stock assessments are initially recommended by the Crab Plan Team and later reviewed and approved by the Science and Statistical Committee (SSC) of the North Pacific Fishery Management Council to create the final version of the Crab SAFE. According to the 2016 Crab SAFE Report, the Tanner crab stock is not overfished and overfishing not occurring. The stock is not depressed and has been classified as rebuilt since 2012. Mature male biomass has generally been rising since 2011/2012. With a projected BMSY of 177%, the CPT and SSC determined the Tanner crab stock to be one of the healthiest in the Bering Sea. For 2016 there is an estimated total mature male biomass of 99.95 million pounds, with the mature male population in the western portion of the Eastern Subdistrict increasing 13% since 2015. The CPT and SSC approved a 2016/2017 overfishing limit (OFL) of 56.46 million pounds and an acceptable biological catch (ABC) of 45.17 million pounds, the latter of which serves as the upper limit on the range of potential catch limits that would represent a sustainable harvest level. While this does not take into account the ADF&G harvest strategy, it demonstrates the CPT and SSC's confidence in the health of the Tanner crab stock. Additionally, new information presented by the cooperative research partners provides compelling evidence that the mature female portion of the Tanner crab population may be underestimated for 2016.

In October 2016, the Board originally noticed an intent to review Proposal 278 (formally RC 40), a proposal that would revise the current Tanner crab harvest policy regulations, at its January 2017 meeting. However, the Alaska Department of Fish and Game and participants

Submitted on behalf of Board member Jensen

in the Tanner crab fishery expressed concern about the proposal, including concerns about replacing existing harvest policies in a manner that is inconsistent with existing findings under the Board's *Policy on King and Tanner Crab Resource Management* (90-04-FB), and that could unintentionally result in ineffective regulations that may result in fishery closures in the future unless the proposal is limited to the 2016/17 season. The Board reviewed these concerns and determined that it would be impossible to resolve these concerns in time to adopt regular harvest policy regulations that would be effective in time to allow for a Tanner crab fishery for the 2016/2017 season. Hence, an emergency rule is the only viable option to provide a conservative total allowable catch for the remainder of the 2016/2017 Tanner crab season in the western portion of the Eastern Subdistrict, the area with a substantial surplus of harvestable mature male biomass.

In the absence of emergency regulations, harvesters would not be able to harvest Tanner crab during the 2016/2017 season due to the need to complete harvest of Tanner crab resources before the end of the commercial season on March 31 and the start of summer molt. Failure to have regulations in effect for the remainder of the 2016/2017 Tanner crab season would preclude the fishery and would be highly detrimental to the welfare of the harvesters, processors, and remote Alaskan communities that are dependent on the crab fisheries. Notwithstanding the female threshold, calculation of a TAC through the current harvest strategy would have resulted in an available 2016/2017 TAC of approximately 8 million pounds. Establishing a TAC of 4 million pounds applies very conservative (50%) buffer to accommodate remaining uncertainty.

Based on the foregoing facts, an emergency exists and emergency regulations with an immediate effective date, providing for a total allowable catch of 4,000,000 pounds of legal size males in the western portion of the Eastern Subdistrict of the Tanner crab fishery would provide a reasonable opportunity for Tanner crab to be harvested in a biologically sustainable manner in the Bering Sea and are necessary in order to preserve general welfare. The Board delegates authority to the Commissioner or the commissioner's designee to prepare and file a formal finding of emergency, if necessary, along with the emergency regulations that reflect the Board's action taken during the January 10-13, 2017 meeting.

ADOPTED: _____

VOTE: _____

ABSTAIN: _____

_____

John Jensen, Chair

Submitted on behalf of Board member Jensen

Notwithstanding the regulations at 5 AAC 35.508, a Total Allowable Catch (TAC) of 4,000,000 pounds of legal size C. bairdi Tanner crab is established for the remainder of the 2016/2017 C. *bairdi* Tanner crab season for that portion of the Bering Sea District west of 166° W longitude. Under emergency authority granted to the Board, this regulation will take effect immediately and expire 120 days from implementation.

By ABSC

Submitted By
Bill Prout
Submitted On
12/27/2016 10:18:24 AM
Affiliation

Phone
9075395476
Email
silverspray647@yahoo.com
Address
P.O. Box 8809
Kodiak, Alaska 99615

To the State of Alaska Board of Fish

In favor of proposal RC 40

My name is Bill Prout and I am the owner and operator of the 116 foot Bering Sea crab vessel the F/V Silver Spray. I have over 40 years of commercial fishing experience throughout the Alaskan waters.

In the time that I have spent fishing, my crew and I have seen the fluidity of the industry as we have strived to harvest our catch sustainably.

In the most recent years of the crabbing season, quotas have been cut, yet, fishing has been as good as I have ever seen it. A sample size of one should not be used as the basis for changing the quota allotment, but when you have no small number of other harvesters saying the same thing, it no longer becomes a single point of information. It is a common consensus among harvesters that CPUE's have been relatively high for the majority of the fleet for the Baridi fishing season.

My crew and myself have come to depend on the revenue generated by Baridi fishing operations to provide for our families and sustain ourselves. With a closure of the 2016-2017 Baridi commercial season, the economic loss would not be considered insignificant, especially when compounded with financial implications of the decline in Opilio TAC.

Additionally, I believe the practice of discardment of Baridi bycatch boarders on Total mismanagement of a vital resource, especially when it is known to induce trauma and increase the mortality rate on the species being discarded. A small allowable Baridi catch should be implemented if only to avoid a total waste of a small, but valuable portion of the resource.

The fact that not even a reasonable allowable quota is in place to offset the guaranteed bycatch of the species shows what I believe is a gross mismanagement of the quota. There is approximately 9,000sq miles of area off the Pribilof islands that is closed and unfished and have historically produced very well, and should be considered when discussing the health of the fishery.

I believe it would be beneficial to implement a temporary allowable biomass catch to the Baridi crab season to work in accordance with negating the effects of the aforementioned issues that a total closure of the season would bring. A conservative TAC amount would not impose substantial risk to the healthiest Bering Sea crab stock.

I hope you take these comments into consideration,

-Bill Prout

CAPTAIN DAVID HARRIS
U.S.C.G. LIC. #940903

2807 S. Lk. Roesiger Rd.
Snohomish, WA. 98290
425-330-0901
davidharris47@msn.com

To: Alaska Board of Fish

Re; Proposal R.C. 40

As your surveys saw an increase of Weastern Tanner Crab by 13% in 2015 and given my observations fishing them , I don't see a problem harvesting a T.A.C. last year (01/2016) we were observing about 50% just undersized crab. Along with pockets of females up by St. George Blue Crab savings area, while trying to stay away from Trawlers as they towed inside of The Fence.

If we are not able to harvest any Western Tanner Crab this upcoming season our vessels and crew will suffer financal hardships on top of the decreased Opilio T.A.C.

One of my main concerns is the Trawl Survey practices, The net used is old technology compared to the vessels towing it. These two variables have to be matched and they are not, It is evident to see with the abundace of BBRKC catches this year, the T.A.C. of Western Tanners and we have yet to find out about Opilio's, should be interesting.

In closing, I am in favor of R.C. 40

Sincerely, David Harris, Captain F/V Arctic Mariner

Signature David Harris 12/16/16

Submitted By
Mikal Mathisen
Submitted On
12/27/2016 10:44:27 AM
Affiliation
Crab boat captain

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Email
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Address
11753 Sunrise Dr NE
Bainbridgde Island, Washington 98110

I support Proposal 278. The female threshold of the Bering Sea Tanner fishery goes back to 1975. In the last 41+ years the fishery and the Bering Sea has changed quite a bit. It would be nice to modernize the regulation to a somewhat nearer term history. In my own and fellow fisherman's personal experience there is a lot of crab out there that is not showing up on the summer survey. Under the existing quota style fishery we can be exact in our catch, so that even small quotas can and should be harvested.

Submitted By
Guy Pizzuti
Submitted On
12/27/2016 4:58:21 PM
Affiliation
Publix Super Markets

Publix Super Markets Inc. operates 1150 supermarkets in the Southeastern United States. We have a proven track record support for Alaskan seafood. At years end, Alaskan seafood will represent just over 10% of our total sales totaling 4.8 million lbs sold. Our support of Alaskan seafood can be confirmed by ASMI. We have worked with them on a number of promotions and have shared our internal efforts to promote Alaskan seafood at our own cost. We proudly display the Alaska seafood logo in our full services cases.

In 2013, in an effort to grow our Alaskan seafood footprint, we became the first company to offer Bairdi crab in the southeast. To accomplish this goal, we chose to partner with the Central Bering Sea Fisheries Association (CBSFA). We felt our entry into this market could have a more widespread impact working with CBSFA vs one of the large Alaskan players. The development of this product in our market, came at a great expense. Through a number of avenues including in store point of sale material, training material, radio commercials, corporate sampling, and celebrity appearances we successfully educated our staff and more importantly customers on the superior attributes of this product. Over the past three years, we have grown this product to represent 33% of our crab sales at over 1.2 million lbs. It is important to note that this is not a tradeoff between Alaskan species. Our move into bairdi crab was a concious desicion on our part to back away from Canadian opilio and replace it with Alaskan bairdi. Just this year, we agreed to work with the Norton Sound Economic Development Corporation (NSEDC) on a number of species including bairdi crab.

The proposal to eliminate the bairdi fishery combined with the quota reduction on opilio will have a tremendous impact on our business. The removal of bairdi crab, combined with the cost increases across the crab complex that result from the bairdi closure and opilio quota decline, are estimated to cost our company approximately $15 million in sales, which equates to a volume decline of 1.8 million lbs or 37.5% of our Alaskan volume. The impact of this combination of regulations will be widespread across retail. Volume will be reduced across all retail by a minimum of 15%.

While the impact to our business is significant, the impact to families that rely on this product to make a living is a much greater concern to Publix. We selected CBSFA and NSEDC because of their ability, through our procurement, to support those fishing communities..

Retailers are willing to build markets and develop new products based on a level of stabiity to the item. It is very difficult to develop a product in a market when availability is not consistent. It ie equally difficult to gain consumer confidence in a market with large price fluctiations that result from massive quota changes.

Publix is a strong believer in the importance of sustainability. We were one of the first to recognize the Alaska RFM scheme. We believe Alaska should be applauded for their commitment to sustainability. The success is unprecendented.

That being said, fishery management must balance the impact to the species in question while minimizing the impact to those that rely on fishery. We believe this unique combination of events between bairdi and opilio crab will cause excessive harm to those that rely on the fisheries. We ask that you consider the widespread impact to the industry; those that harvest, those that sell, and all those in between that rely on these fisheries when making your final decision. It is our hope that you will allow some level of bairdi harvest in 2017 and look for a more long term rebuilding plan.

Thank you in advance for your consideration.

Sincerly,

Guy Pizzuti

Category Manager - Publix Seafood

Scanned BOF

Date: December 8th, 2016

To: Alaska Board of Fisheries

ADF&G Boards Supports

P.O. Box 115526

Juneau, AK. 99811-5526

From: Scott Campbell Sr

Re: Support of proposal RC 40

I am a partner/ manager with my son in the fishing vessel Seabrooke which participates in the Bairdi fishery in the Bering Sea . I am writing in support of proposal of RC 40 which could potentially allow the Bering Sea District commercial Tanner crab fishery west of 166 to open for the 2016-2017 season. The last few years that our vessel Seabrooke has fished the Tanner crab fishery in the Bering Sea we have observed a steady increase in our CPUE especially in the Western district. In the 2015-2016 Western district Tanner crab season our vessel observed some of the most robust fishing that we have ever had over a very large geographical area. Our captain started out fishing just west of 56N & 166W and ended the season at just below 58N & 171.30W. He was able to observe a very healthy stock with a good mix of recruitment of small males, females and abundance of legal male populations which was reflected in this year's survey. The Tanner crab fishery has become a very viable and healthy fishery over the last few years which made up approximately 54% of our crew and vessel income. The economic loss to the vessels, crews, and companies associated with this fishery are very large do to the 2016-2017 Tanner crab closure and reduction of TAC's in the King crab and Snow crab fisheries. Our company made capital investments in purchasing quota in the Tanner crab fishery based on the health of the fishery we have observed while fishing and the continued increase in TAC's that have occurred up until this year. If a conservative TAC could be implemented for the Western Tanner crab district for the 2016-2017 fishing year, I feel that it would not be a substantial risk to the health of the fishery based on our at sea fishing observations during the 2015-2016 fishing season and given that the 2016 survey shows a mature male Tanner crab increase of 13% from the previous 2015 survey. The economic benefits to those dependent on this fishery for their lively hood should be important consideration if a fishery could be executed without imposing a substantial risk to the health of a resource that appears healthy and increasing in bio mass.

Thank you for your time in reading my comments and consideration of this proposal.

Sincerely,

Scott Campbell Sr

Scott Campbell Sr, Owner/Manager

F/V Seabrooke

Bristol Bay Economic Development Corporation
P.O. Box 1464 • Dillingham, Alaska 99576 • (907) 842-4370 • Fax (907) 842-4336 • 1-800-478-4370

January 5, 2017

Re: Tanner crab Board of Fisheries Proposal 278

Board of Fisheries members,

Thank you for the opportunity to provide comment on Board of Fisheries Proposal 278.

Bristol Bay Economic Development Corporation (BBEDC) is a Community Development Quota (CDQ) entity that represents 17 communities in the Bristol Bay region. Through investments in Bering Sea fisheries like Bairdi, BBEDC is able to provide a number of meaningful benefits to the roughly 6,000 year-round residents of the region, including scholarships and professional development, assistance to local small-boat fishermen, and community development projects.

We pride ourselves on promoting responsible stewardship, and supporting conservation efforts that ensure the long-term sustainability of Bering Sea fisheries. We believe that fisheries management should consider a wide range of biological, environmental, and socio-economic factors, and reflect what is in the best interest of the resource and stakeholders. This can only be achieved through active dialogue between industry, stakeholder groups, and ADF&G.

BBEDC supports the ongoing efforts of the Bairdi Ad Hoc Committee, Alaska Bering Sea Crabbers, and Bering Sea Fisheries Research Foundation to work with Alaska Department of Fish and Game staff to provide the Board of Fisheries with the necessary information to make responsible management decisions. We also appreciate Westward staff's willingness to engage with stakeholders throughout the process. We are confident that the continued relationship between stakeholders and ADF&G staff will engender management strategies that reflect the diversity of stakeholders, and embody our shared goal of long-term resource sustainability and opportunity.

We are confident the Board of Fisheries will base its decision regarding Proposal 278 on careful consideration of the scientific information provided by both NMFS and BSFRF, recommendations from staff, and input from stakeholders. As such, BBEDC respects the Board's decision on this issue; we would support Proposal 278 if the Board determines that the information provided warrants opening the fishery, but would respect the Board's decision in the interest of the long-term resource sustainability should it determine that the proposal would result in a demonstrable conservation concern.

We are excited to continue participating in the Board of Fisheries process to ensure that the harvest strategy reflects the best available information, is consistent with other comparable crab harvest strategies, and provides opportunity for fishermen and rural communities alike to benefit from a healthy tanner crab fishery.

Sincerely,

Norman Van Vactor
CEO/President

CITY OF UNALASKA
P.O. BOX 610
UNALASKA, ALASKA 99685-0610
(907) 581-1251 FAX (907) 581-1417

January 6, 2017

John Jensen, Chairman
Alaska Board of Fisheries
Alaska Department of Fish and Game
P.O. Box 115526
Juneau, AK 99811-5526

Re: City of Unalaska Comments
Supporting Proposal 278

Dear Chairman Jensen:

The City of Unalaska submits to you the following comments in support of Board Fisheries Proposal 278.

We view Proposal 278 as a temporary measure that would allow a small guideline harvest amount in the area West 166°W longitude, to be harvested based on parameters laid out by the Alaska Department of Fish and Game. This is not permanent change to the Bering Sea Tanner Crab harvest strategy. In our estimation, Proposal 278 is basically going to be in effect for 120 days until the C. bairdi Tanner fishery in the Western District closes on March 31 by regulation.

We don't feel this proposal causes a conservation concern because this fishery is not in a rebuilding mode and only the mature male legal crabs are going to be harvested. Levels of female bycatch in the C. bairdi Tanner crab fishery are very low and stock of mature male crab are at some of the highest levels seen in the past five years. It is estimated that mature male biomass in the western district alone is at 70 million pounds.

We strongly support the Board of Fisheries and ADFG staff meeting as soon as possible to address much needed changes to C. bairdi Tanner Crab harvest strategy. We feel this of utmost importance so that this very important crab fishery can move forward unimpeded in future years.

We think it is also very important for the Board of Fisheries to review the information on survey comparisons presented by Scott Goodman, the Bering Sea Fisheries Research Foundation Executive Director. This information has been shared with the staff of ADFG. The information presented indicates that high water temperatures and large biomass events may lead to mature female bairdi responding in unknown ways, such as moving out of the traditional survey area.

During the past three years of warm water temperatures, the NOAA summer survey showed some high female bairdi biomass stations west of 173°W longitude, which are not included in ADFG's overall female biomass calculations. As Mr. Goodwin states in his survey document, the information presented may warrant further consideration of the current C. bairdi Tanner stock status issues, and we concur.

We must also remember that the Crab industry is facing major stock allocation reductions across the board for the 2016-2017 crab seasons: (a) Opilio Tanner was decreased 60%, from 51 million pounds to 21 million pounds; (b) Bering Sea Tanner crab is facing a total closure due to female threshold levels not being met; (c) Bristol Bay Red King crab was decreased 16%, from 10 million pounds to 8.4 million pounds; and (d) St. Matthew and Pribilof Blue King Crab fisheries are closed. These declines have caused economic hardship for all sectors of the crab industry. Ex-vessel values to the harvesting sector for Tanner Crab is in the $40-50 million range, based on the 2015 harvest level. A complete closure of the Bering Sea Tanner crab fishery will have major negative economic impacts on harvesters, processors, coastal communities, and the State of Alaska. The City of Unalaska, the state's largest crab processing community, faces losses in the millions of dollars from sales tax on fuel sales and fish taxes (both local and state shared). Unalaska support sector businesses working with the crab fleet will also face revenue declines.

In conclusion, the City of Unalaska requests that the Board of Fisheries support Proposal 278 as a onetime measure allowing a fishery to proceed, with harvest levels laid out by the Alaska Department of Fish and Game. We also encourage the Board of Fisheries and the Department of Fish and Game to meet as soon as possible to address potential changes to the C. bairdi Tanner harvest strategy.

Thank you for your consideration of our comments on this important issue.

Sincerely,

CITY OF UNALASKA

Frank Kelty
Mayor

cc: Unalaska City Council Members
Glenn Haight, Director ADFG Board Support

PACIFIC NORTHWEST CRAB INDUSTRY ADVISORY COMMITTEE (PNCIAC)
Lance Farr, Chair
8941 179th Place SW
Edmonds, Washington 98040
fffish@hotmail.com
C 206 669 7163; F 425 776 9894

January 8, 2017

Mr. Glenn Haight, Executive Director
Alaska Board of Fisheries
P.O. Box 115526
Juneau, AK 9981
Fax: 907 465 6094

Re: Proposal 278

Dear Mr. Haight

The Pacific Northwest Crab Industry Advisory Committee (PNCIAC) is the Alaska Board of Fisheries (AKBOF) and North Pacific Fishery Management Council (NPFMC) designated non-resident industry advisory committee, representing industry participants from Washington and Oregon. It was established in 1990 at the time that the Bering Sea and Aleutian Islands King and Tanner Crab Fishery Management Plan was approved by the Governor of the State of Alaska, followed by the Secretary of Commerce. PNCIAC has balanced representation of harvesters and processors. PNCIAC since its beginnings, has worked with the Board of Fisheries, ADF&G, the NMFS, and the NPFMC. Together, the PNCIAC and the agencies have worked together to improve resource management.

PNCIAC supports Proposal 278 to have a conservative harvest of C. baridi in the Western district. Proposal 278 is not a long-term fix but will allow a harvest this year and expire in 120 days. PNCIAC feels that C. bairdi is not depressed with the mature male biomass the 5th highest throughout the survey time series, with a mature male biomass of 99.95million lbs.

Survey methods have changed across the early portion of the reference period, 1975-2010. Modification of the trawl net used by NMFS annual surveys starting in 1982 changed the selectivity of the survey for crab. The existing mature female bairdi biomass threshold is biased by higher survey selectivity in the early period (1975-1981) and lower survey selectivity in the later years (1982-2010). Information relative to the NMFS survey and the definition of mature females that the Board should consider that may indicate that mature female biomass is underestimated in 2016.The Bering Sea Research Foundation survey results adjusted to the NMFS survey estimates of mature female bairdi would reflect a mature female biomass of 9.94 million lb., exceeding the 9.832 mil lb. threshold by about 1%. Mature male bairdi abundance in 2016 is higher than any closed season year, and mature female bairdi abundance is the third highest in closed season years.

According to observer data and PNCIAC-members who have harvested Bairdi since the 1970's, the fishery targets males with little incidental catch of females. You just don't see females in our pots. There was a small decrease in female and an increase in male crab abundance suggesting a fishery is possible in the west without threatening sustainability of the stock. PNCIAC feels the current harvest strategy information relative to the NMFS survey and the definition of mature females that the Board should consider may indicate that mature female biomass is underestimated in 2016.

PNCIAC also is worried about having incidental retained bycatch of bairdi on board when fishing Opilio, which having a conservative harvest would alleviate the problem of violations for having any bairdi on board.

PNCIAC feels that the harvest strategy for C. baridi is antiquated and needs to be updated. PNCIAC would support long term changes to the harvest strategy in time for the 2017/2018 season.

Thank you in advance for your consideration,

Regards,

Lance Farr, Chairman
PNCIAC

CITY OF SAINT PAUL
P.O. BOX 901
SAINT PAUL ISLAND, ALASKA
99660-0901
Admin: (907) 546-3110
FAX (907) 546-3188

January 9, 2016

Re: BOF Proposal 278

Dear Board Members:

We are writing this letter in support of the Proposal 278 concerning the Bairdi fishery.

The recent trends in the crab fisheries have not been good for Saint Paul. For 2015-16, snow crab landings from both the IFQ and CDQ fisheries were 40.61 million pounds, a 40% cut from 67.9 million lbs in 2014-15. This season the snow crab TAC was cut by almost 50% to 21.5 million lbs. For bairdi the 2015-16 quota was 19.64 million pounds, which helped make up for the reduction in snow crab last year. This year the bairdi fishery is closed. Other crab fisheries such as the Pribilof red and blue king crab fisheries have remained closed for several years, or remained at very low levels such as the St. Matthew blue king crab fishery (closed this year).

As you may be aware, Saint Paul's economy is highly dependent on the crab fisheries, in particular the snow crab fishery. From 2000 to 2007, the City of Saint Paul experienced a commercial fishery failure under Section 312 of the Magnuson-Stevens Act (MSA) as determined by the National Marine Fisheries Service (NMFS). On average the fishery failure resulted in an 85% drop in City revenues on a yearly basis since the crab stocks collapsed in late 1999. This local economic depression has resulted in job losses and a significant decrease in the resident population over the past decade and a half.

Due to the 40% cut in the snow crab TAC from 2014-15 to 2015-16, the City experienced a corresponding loss in revenues which required budget cuts and laying off personnel. This occurred on top of reduced halibut quotas which are vital to the local fishermen, their crews, and their families. Given the additional cut in the snow crab TAC by almost 50% this year, the City will be forced to make further painful adjustments to its budget.

The City on average derives $500,000 to $1,000,000 in fish tax revenues each season. These revenues as well as fees derived from use of water, sewer, fuel, and other utilities, and harbor facilities, are the City's single largest source of revenues, and are critical to continued infrastructure investments in the community, and the salaries of local employees. In addition, the local village corporation benefits from the lease of space for container/crab pot storage. During the snow crab season, the harbor is busy with harvesters off-loading crab to the Trident Seafoods St. Paul plant. Services and supplies purchased by crewmembers generate increased business activity of up to 25% in the local store. Between 300 and 400 non-residents work at the shore-based processing facility during the crab season, thereby contributing greatly to local

economic demand. Air travel and cargo benefit from the activity on Saint Paul during the snow crab season. All of these direct and indirect activities are threatened due to low TACs and shutdowns in the crab fisheries.

For its part, the Central Bering Sea Fishermen's Association (CBSFA), the local CDQ group, holds important percentages of crab quota including bairdi. CBSFA is an important driver of economic activity, job creation, social programs, and investment in fisheries related infrastructure on Saint Paul Island. It is important to the health of this key community organization that bairdi be harvested.

The City has worked closely with CBSFA, the crab harvesters, other communities, and Trident Seafoods which owns the only shore-side processing plant own Saint Paul, in order to maximize the value of the Bering Sea's crab fishery resources to the community through the Crab Rationalization Program and other initiatives.

While a favorable disposition of Proposal 278 may only result in a limited commercial bairdi fishery, even a small bairdi fishery would be helpful to preserving some of the economic benefits to Saint Paul that we have outlined above. It would also provide an incidental catch buffer as the snow crab fishery is pursued in the coming months. Going forward, we have valued the collaborative approach with ADF&G Westward staff, and look forward to continued interactions with ADF&G and the rest of the crab industry.

To conclude, we ask that you support Proposal 278 and allow for a bairdi fishery.

Sincerely,

Simeon Swetzof, Jr.
Mayor, City of Saint Paul, Alaska

Alaska Board of Fish Submittal for Kodiak Meeting
RC 2 Bairdi Crab January 11, 2017
Submitted by Leonard Herzog
Crab Vessel Owner Operator

Chairman John Jensen and Board Members,

My name is Leonard Herzog and home is Anchorage Alaska. I own a crab vessel in Homer Alaska that is dependent on the Bairdi fishery to provide work for its crew. I have fished in Bristol Bay for salmon for over 30 years. I am testifying on my own behalf but I am a board member for the Bering Sea Research Foundation as well as the ICE and ABSC harvesting groups.

I strongly believe that there is a harvestable surplus of mature male bairdi in the Western district and that this board should temporarily suspend the minimum female requirement in the harvest strategy to allow an appropriate season this year. The federal estimate of mature male abundance is at 99 million pounds the fifth highest in history, the federal over fishing limit at 56.5 million pounds is higher than Opilio or Bristol Bay Red King Crab, the directed fishery has little impact on females, the females are impregnated, there appear to be good recruitment of smaller crab into the fishery. The large males taken in a directed fishery will soon die of natural mortality – they cannot be banked for the future – and will not be available to impregnate a future resurgence in the female population. In my opinion the large surplus of mature males may actually impede recruitment as they compete with smaller crab for food and are known to be cannibalistic.

My testimony today will focus on recent work by the Bering Sea Research Foundation that was not available to ADFG in October but has been shared more recently. Using Best Science and our understanding of catchability and net selectivity we are actually now over the minimum female threshold in the harvest strategy.

1) By using the 2016 side by side tow information to inform the NMFS survey we would be over the minimum threshold
2) Because the NMFS net changed in 1981 and was 30 to 35% more efficient in catching female bairdi from 1976 to 1981 adjusting those years would additionally lower the female threshold in the harvest strategy (A more detailed discussion is attached.)

Other elements specified in the in the harvest strategy that need to be updated lend confidence to allowing a season:

1) Best science shows that a significant proportion of the mature female biomass are below the 80mm and 85 mm cutoffs in the harvest strategy and thus not counted
2) Significant amount of mature female bairdi are found outside the harvest areas and therefore not counted
3) No fishing is allowed in the Pribilof Savings Area
4) Recent Research Foundation work suggests that selectivity of Bairdi is similar to Opilio – i.e. the NOAA net may only catch about one of three mature female bairdi and 7 out of ten large mature males.
5) Both the federal SSC and Crab Plan team have dropped the earlier time series years in the harvest strategy – in part because of environmental changes and in part because of the significant changes in their net after 1981.

The four bullets below provide a more in depth discussion:

- Using recent cooperative survey results to adjust 2016 NMFS survey estimates of mature female bairdi would reflect a mature female biomass estimate of 9.94 million lbs, exceeding the 9.832 mill lb threshold by about +1%. A further review of 2016 side by side results shows higher abundance mature female stations have lower selectivity values than survey-wide results. By applying these lower selectivity values across the bairdi survey area, the estimate of mature female biomass would be over the threshold by about +5%.
- There is significant difference in 2016 male (high) and female (low) mature bairdi abundance results relative to the 42-year NMFS survey time series. 2016 results are more similar to years with open seasons. Mature male bairdi abundance in 2016 is higher than any closed season *year, and mature female bairdi abundance is the third highest in closed season years.*
- Survey methods have changed across the early portion of the reference period, 1975-2010. Modification of the trawl net used by NMFS annual surveys starting in 1982 changed the selectivity of the survey for crab. The existing mature female bairdi biomass threshold is biased by higher survey selectivity in the early period (1975-1981) and lower survey selectivity in the later years (1982-2010).
- The time series estimates of mature female bairdi from the NMFS annual survey vary significantly depending on how maturity is determined. The actual mature female bairdi biomass, as observed onboard the survey based on the condition of the abdominal flap, is significantly higher than the estimate of female maturity defined by terms in the current ADF&G harvest strategy, which uses size cut off values (80 mm, and 85 mm). A significant proportion of actual mature females is below these cut off values, is excluded from calculation of the biomass threshold, and significantly underestimate

Following is mostly just a common sense point about bairdi compared to the other two big stocks - when you look at MMB and then follow through OFL, ABC, and TAC for each here is what you get for 2016:

[all in millions of lbs]

BBRKC
MMB 52.9
OFL 14.6
ABC 13.2
TAC 8.5

OPILIO
MMB 201.9
OFL 52.2
ABC 47.0
TAC 21.6

BAIRDI
MMB 99.9
OFL 56.5
ABC 45.2
TAC 0.0

Bairdi has the highest OFL of the three, and an MMB right in the middle (about twice BBRKC and half of snow crab). Regardless of other management measures or other scientific uncertainties for bairdi, it certainly shows at least a disconnect in the management process when looking at the "20,000 foot" view like this.

Understanding there are different precautionary principal with each species note from a two thousand foot perspective how allowing a reasonable directed fishery in the West is compatible with management of the other Bering Sea crab stocks

Respectfully Submitted,

Leonard Herzog
January 11, 2017
907-229-4986
herzog.lenny@gmail.com

Submitted By
Jeff Hathaway
Submitted On
12/21/2016 12:31:31 PM
Affiliation
Owner and Operator

I am writing about the Bairdi crab stocks in the Bering Sea. I own the F/V Determined, and am Captain of the Destination. I fished bairdi tanner in 2015, and 2016. I have operated crab vessels in these waters since 1985. We fished right up to the closure this year on March 31. In the areas we fished, I have never seen better fishing, over an extended area. We were seeing all sizes of crab, both male and female bairdi.

During King Crab in October 2016, we were fishing between 162 degrees w. longitude to 164 w. longitude and were consistantly seeing female bairdi in our pots.

With the large sanctuaries that are closed to pot fishing for bairdi, all waters east of 163, and the Blue Crab savings area in the Pribilof Islands, the risk of overfishing these stocks is greatly reduced.

I'm urging the Board to open Baidi in 2017, and perhaps re-write the regulations that would close the season for two more years.

The F/V Determined, home ported in Sand Point, Alaska, will be tied up if there is not a fishery in 2017.

Sincerly, Jeff Hathaway

Submitted By
Mikal Mathisen
Submitted On
5/10/2017 6:12:09 PM
Affiliation
Crab boat captain

Phone
206-842-5154
Email
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11753 Sunrise Dr NE
Bainbridge Island, Washington 98110

I am writing in support of Proposal 281 and RC 35.

I have been running a Bering Sea crab boat since 1995. The Bairdi fishery right now is as strong as I have seen it. Last fall while fishing for Bristol Bay Red King Crab we had a steady supply of Bairdi bycatch. The majority of the Bairdi we saw were male, but a few females were also noticed. Keep in mind that we were fishing with 9" web so the Bairdi could get out of the pots anytime they wanted. This winter I did my Opilio fishing about 100 miles west of the Pribilof Island and admittedly saw very few Bairdi. However every boat operator I spoke to fishing east of the Pribilof Islands picked through a steady supply of Bairdi while catching their Opilio. It is a shame to discard all of these legal sized crab.,

The Bairdi fishery had been very helpful to the fleet as the Opilio quota has dropped the last few years. The processors were beginning to gain traction in the marketing of Bairdi as well before it was cut to zero. It is important to find a level that we can fish these crab for year after year,

It is important to remember that the Bairdi species is also protected by the thousands of square miles of closed grounds. In previous generations it was very common to fish Bairdi east of 163 West Longitude and in the greater Pribiof area. These two closed areas in effect give a Bairdi sanctuary.

Thank you for considering my comments.

Mikal Mathisen

To: Glen Haight

From: Bruce Cain

Subject: Comments on Copper River Chinook 2017 Forecast

Date: May 10, 2017

Glen: If possible, could you please distribute this to the members of the Alaska Board of Fisheries. Thanks you.

Comments on the Copper River 2017 Chinook Forecast.

My name is Bruce Cain, I serve as the President of the Copper Valley Chamber of Commerce. We represent nearly 200 businesses in the Copper Basin, many of which rely on the economic activity from the sport fishery, personal use fishery and the subsistence fisheries on the Copper River. The closures and restrictions on these fisheries based on the lowest forecast in the history of the Copper River have significant economic impacts to the economy of the Copper Basin. This includes loss of business to sport fishing guides, lodges, bed and breakfast, restaurants, fuel distributors, repair shops, grocery and support businesses. In addition the subsistence food supply of our families is at risk causing great suffering. Also there are tremendous economic losses caused by the restrictions on the commercial fishery that some of our members participate in.

The closures and restrictions based on the preseason forecast are summarized as I understand it as follows.

- Commercial fishery, extended inside closures including Egg Island and Softuk. Extended inside closure periods for the early season. Delaying the commercial opening from May 15 to May 18.
- Personal use fishery. Close to the taking of Chinook.
- Sport fishery. Closed to the taking of Chinook.
- State Subsistence fishery dipnet Chinook season limit reduced from 5 to 2.
- State Subsistence fishwheel Chinook changed from basically no limit to limited to 2 per permit holder and wheels must be closely tended at all times the wheel is operational and chinook released that are over the limit. This constant monitoring is a restriction from the regulation that requires wheels be checked every 10 hours.
- Federal Subsistence (voluntary restrictions, requested by users and acted on by the Federal manager) rod and reel and dipnet Chinook season limit reduced from 5 to 2. Fishwheel, delay opening from May 15 to June 1.

We support the conservative approach to protecting our salmon stocks, however, we also require that the department use the best professional tools to base its management decisions on. We are very concerned about the methodology used to generate the doomsday forecast for the 2017 chinook run in the Copper River. My understanding is the forecast being used is based on the 2016 Chinook return. My biology book says that the forecast for Chinook should be based on the return 4-5 years ago.

The economic impacts from the actions taken based on this very questionable forecast are immense. All fishery participants are facing lost opportunity, our economies are facing severe negative impacts and even our food sources from subsistence are reduced as well as the state subsistence fish wheel

operators now have to dedicate their full time to monitoring the wheel rather which is a significant shift in use of peoples time in other productive tasks.

I am surprised that no one else has questioned the methodology and the results of the forecast that is being used to make such significant changes to our lives economies and communities. Since I am not aware of any other questions on this issue, so I am bringing it up. Here are my thoughts.

Last time I checked, the Chinook salmon have a 4-6 year life cycle. How does any credible biologist base a chinook forecast on last year's return?

I thought the Chinook forecast should be based on the 2013 return. It should also be based on environmental conditions on the spawning beds, weather patterns, water conditions, harvest effort and a lot of other factors. I think the department is missing a lot of this information and should be taking it into account.

I attended the public meeting on the 2017 Copper River/Prince William Sound forecast in Cordova on April 20, 2017 in Cordova. Steve Moffitt was asked this question and he told the public that the model using last year's run as a base produced the least margin of error of all the models. Say what? So we use a model that has nothing to do with the brood stock year because it produces the least margin of error? Error from what? A mathematical formula or what is really going to happen.

I thought the Chinook forecast should be based on the 2013 return and attempt to estimate as closely as possible what is actually going to occur within limited human capabilities.

I am thinking the forecast model being used might be off. Not just a little either. I think it might be off more than any other forecast in history. I am <u>really sure</u> that the forecast using last year's run as a model is NOT going to be the forecast with the least margin of error. At least if you are measuring margin of error from what is forecast to what actually occurs.

One thing that people are saying now a days is that in addition to scientific data, it is important to take into account traditional ecological knowledge. The knowledge of the elders. Anecdotal information is what scientists call this. They often discount it. But big mistakes can and have been made by not taking this into account. I am providing the board with some of this information so hopefully you can take it into account.

<u>Let me tell you about 2013.</u>

You can call it what you want. Anecdotal. Unsupported scientifically. Unverifiable. Etc. But here it is to the best of my ability to put it together. You can verify most of this by looking up emergency orders, weather data, presidential disaster declarations, Nenana ice classic records and emails and correspondence if you want to do the work.

Here goes:

Katie John Passed away on May 31, 2013. This might not seem interesting to a research biologist, but to those involved in traditional salmon fishing on the Copper River, this was a big deal. It is also a big deal to remembering what happened to the early run salmon returns in 2013 which, in my opinion, has a big effect on the forecast for chinook for 2017 and as you will see, why there was a run failure in 2016.

Here is why it was a big deal.

The breakup for 2013 was late. One of the latest in history. This is documented on the Copper River and also other interior rivers by weather data. The Nenana went out later than any other year in recent memory.

In addition, to the extended cold weather holding the river ice in, there was a 20 inch snowfall May 13 and May 14 in the upper Copper drainage. Late cold and snow continued through mid May. I flew the Copper River and documented ice conditions on May 19, 2013. The upper Copper was just starting to break up on its tributaries. The main stem was mainly out and the water was super low. Almost unbelievably, the lower copper was frozen solid (see pictures at the end of the document). I have never seen it like this before or since.

As a result, the Miles lake sonar was not able to be installed and no in river count data was able to be gathered. This resulted in the Commercial fishery being closed and managed very conservatively including total closures and inside closures through May and early June.

The last week of May it snowed and then it was 70 degrees. I had 90 degrees at my house in Glennallen on May 26, 2013. This set off a massive breakup flood late May 26 through May 28, 2013 that washed out all the fishwheels and fish camps in the upper Copper River. This is documented by weather records as well as a presidential disaster declaration.

In spite of this flooding, the lower river at Miles Lake remained frozen in and the sonar could not operate. This kept the Commercial fishery closed. Check ADF&G records to verify this.

Back to Katie John. She passed away on May 31, 2017. Her funeral and potlatch were in Mentasta on June 8, 2017. The flood wiped out all fish wheels so there were not any fish for her potlatch. Mark King and Jack Hopkins went subsistence fishing in Cordova and caught some salmon and sent them to Gulkana in a chartered plane. They were picked up and delivered to Mentasta by pickup truck. I helped coordinate the trans-loading of the fish at the Gulkana Airport. Mark and Jack also reported that the flats were full of fish moving through the Copper River Delta to the river and getting past where they could be fished with commercial fishing gear. The reason I mention this is because Mark and Jack were able to subsistence fish because the commercial fishery had been closed so long that subsistence fishing on the flats was automatically opened by regulation. I also mention it to demonstrate that the flood had completely wiped out all fish wheels that could fish on the upper river. Also, don't forget these guys are seasoned flats fishermen. If they say they saw a lot of fish going up, I believe them. Scientists usually don't. You can check the openers and emergency orders for 2013 with ADF&G records.

2013 was also the first year that the Dipnet fishery opening was delayed so there was no fishery of any kind except the limited subsistence fishery on the flats for the entire Copper River system for the early run. The salmon came in and swam up river past the commercial fishery, past the miles lake sonar that was not installed, past the Baird Canyon sampling site that could not be put in the water due to ice.

The Canyon Creek recapture sampling wheel was launched May 26, 2017 but had to be pulled right back out to save it from the flooding. May 27, 2017 the upper copper had a blow out breakup flood due to 90 degree weather right after all the late snow and late cold weather. The Aspens budded on May 26, 2013. This is a traditional indicator of first fish. I have seen this work to the day for many years running research wheels and subsistence wheels. No one could test this because the flood stopped all fish wheels from being launched. You can be sure that fish were going by Chitina by May 26, 2013, but a lot

of them were probably held back by the flood. The Canyon Creek crew re-launched the recapture wheel by June 5, 2017. On June 10, 2013 the water dropped to pre-breakup lows and a huge pulse of stacked up fish from the flood hit the Canyon Creek wheels and overwhelmed the live boxes causing sampling mortality event. I have never seen this happen in the spring ever. I have seen it happen many times in the fall when the high water drops and the whole run that is held back all season pulses through. The expired fish were brought to Copper River Native Association for distribution. I participated in the coordination of the delivery of the sampling mortalities from the river at Chitina to Copper River Native Association in Copper Center by truck. There were two totes of Chinook and Reds.

On June 16, 2013 Ted Sanford, President of the Mentasta Tribal Council was visiting Fish Creek a tributary to Mentasta Lake to see if any salmon had showed up yet. He reported to me at a Mentasta Village Council Meeting that I attended on June 17, 2017 that there were salmon backs out of the water from bank to bank and upstream and downstream as far as you could see. Fish creek was completely full of Salmon. He said that no one had seen that many fish in fish creek in his lifetime. He heard elders talk of runs like that in the early 20th century. I told Ted, the salmon returned in honor of Katie. I believe Ted. I called the department to report this and was told. "Nothing has come to our attention that would lead us to believe that a large return of salmon made it to Mentasta." Say what you like, that is what I saw and heard and said.

What this demonstrates is that in 2013, the brood year for 2017, a huge early run of reds and very likely Chinook salmon went past the commercial fishery while it was closed so it was not detected by the commercial fishery data collectors. The fish also were not recorded by the miles lake sonar because it was not installed due to late ice. It was detected by the Canyon Creek sampling site (125 miles upstream) when it overwhelmed the live boxes on June 10, 2013. It was not detected by the dip net fishery, because it was closed. It was not detected in the subsistence fishery because all the wheels were washed away or could not be launched because of the flood. It was observed and reported to me by Ted Sanford, President Mentasta Village Council at Fish Creek tributary to Mentasta Lake. (which the department discounted when I reported it)

The reason for this extensive listing of environmental and fishery information is that the giant early return of early season reds and most likely Chinook will probably result in a very large return of Chinook and early run reds in 2017. This is at a time the department is forecasting the lowest return in history and has pre-emptively closed or severely restricted all fisheries.

Basing a forecast for Chinook on last year's return seems foolhardy at best by knowledgeable elders and if you ask me or professionals I have in acquaintance, there is a different less flattering description of such actions. The department justified the model of using last year's run as the model to forecast this year's run because it is the model showing the least variability. I submit to you that we are about to have the largest variability in history between the forecast and the actual run. I ask you if the forecast is off, is there accountability for the economic and social cost of closing the fishery unnecessarily? Where are my 3 button suit hand on the constitution maximum sustained yield politicians if the lowest margin of error methodology turns out to be the biggest forecast error in history?

Also, as promised at the beginning, here is a little tidbit for the 2016 run failure. Everyone wonders about what happened to the Chinook and also the Gulkana hatchery brood stock for 2016. Ideas have been proposed such as global warming, the blob, sea bird die off, Fukushima, high seas intercept, etc. etc. How about looking in our own back yard? How about paying attention to what is going on in our

own river? How about getting up out of our chairs and putting on a pair of hip boots and visiting the field? Well? There was a FLOOD in May of 2013. Not only did it allow the huge early run of adults to reach the spawning beds, which will result in a huge early run in 2017; it ALSO washed out all the emerging fry that were at their weakest point when the flood hit. The emerging fry washed out in May of 2013 were from the 2012 return. That is the same brood year for 2016. Maybe I should say this again. The emerging fry washed out in the May 2013 flood were from the 2012 return. This is the brood year for the 2016 run failure. In my opinion, the flood caused or significantly contributed to the 2016 run failure and no one at the department that I am aware of recognizes this. I also predict that the same flood will result in a huge early run of reds and Chinook that will go through all fisheries that are closed based on a forecast that will be demonstrated at the end of the season to be biggest forecast error in the history of the Copper River.

Nuff Said.

The lower Copper River was still frozen Solid on May 19, 2013. Aerial photo of Baird research camp and Baird Canyon upstream from Miles Lake.

The Upper Copper had started to flow and break up but water levels were very low on May 19, 2013 due to very late cold temperatures. Canyon Creek Research Camp May 13, 2013. A little over a week from the late snow and extreme hot weather conditions that caused a large breakup flood.

PACIFIC NORTHWEST CRAB INDUSTRY ADVISORY COMMITTEE (PNCIAC)

Lance Farr, Chair
8941 179th Place SW
Edmonds, Washington
98040 fffish@hotmail.com
C 206 669 7163; F 425 776 9894

May 10, 2017

Mr. Glenn Haight, Executive Director
Alaska Board of Fisheries
P.O. Box 115526
Juneau, AK 9981

Re: PNCIAC recommendations to Board of Fisheries Bairdi Harvest Strategy Revisions

The Pacific Northwest Crab Industry Advisory Committee (PNCIAC) is the Alaska Board of Fisheries (AKBOF) and North Pacific Fishery Management Council (NPFMC) designated non-resident industry advisory committee, representing industry participants from Washington and Oregon. It was established in 1990 at the time that the Bering Sea and Aleutian Islands King and Tanner crab Fishery Management Plan was approved by the Governor of the State of Alaska, followed by the Secretary of Commerce. PNCIAC has balanced representation of harvesters and processors. PNCIAC since its beginnings, has worked with the Board of Fisheries, ADF&G, the NMFS, and the NPFMC. Together, PNCIAC and the agencies have worked together to improve resource management.

PNCIAC appreciates the Alaska Department of Fish and Game and the Board of Fish having a special meeting to address the bairdi crab harvest strategy in time for an updated harvest strategy to be ready for next year's TAC setting.

PNCIAC considered a list of considerations in RC 35 from the March 20-24 Board of Fisheries meeting as well as the Board Generated Proposal 281 submitted by the Alaska Department of Fish and Game.

PNCIAC members found unanimous agreement for the following recommendations to the Alaska Board of Fisheries:

a) improve the definition of female maturity determination to include actual maturity rather than only carapace measurement.

b) include crab west of 173° and/or other areas not currently included in the biomass estimate but for which survey data are consistently available

c) using the same reference years as in the federal stock assessment (1982-2016)

d) PNCIAC does not support the 50% TAC penalty following a closed year

e) support alternatives to a single open/close threshold such as alternatives to the on/off switch based solely on a female threshold being met.

f) Male threshold – in years with low female abundance and high male abundance, PNCIAC supports a mechanism in the harvest strategy to allow for a harvest the excess male crab.

PNCIAC also supports continued assessment of the following issues, recognizing that these are part of a longer-term effort.

a) Consider using selectivity data from the stock assessment
b) Consider using stock assessment model outputs as the basis for the harvest strategy
c) Evaluate existing additional conservation buffers (new shell/old shell selectivity)
d) Evaluate alternative measures for the female abundance threshold (e.g., fertilization rate; egg production index; effective spawning biomass; total mature biomass)

Thank you in advance for your consideration,

Regards,

Lance E. Farr, Chairman
PNCIAC

I. Introduction

The members of the *bairdi* Tanner crab ad hoc committee (ad hoc committee) greatly appreciate the efforts of the Alaska Department of Fish & Game (ADF&G) and the Alaska Board of Fisheries (Board) to evaluate potential revisions to the Eastern Bering Sea subdistrict *bairdi* Tanner crab harvest strategy (5 AAC 35.508) at a special meeting.

The fishery has become increasingly important to harvesters, processors, and coastal communities. Rationalization of Alaska's crab fisheries has provided management tools to allow for consistent, sustainable, and economically viable resource use, while also greatly improving safety at sea. Since ADF&G and the National Marine Fisheries Service (NMFS) determined the *bairdi* stock to be rebuilt in 2012, stakeholders have increasingly included *bairdi* in their portfolios. These long-term investments in the resource incentivize long-term sustainability of the resource instead of short-term gain, and allow for development of a specific market for *bairdi* products. For this reason, the ad hoc committee fully supports revisions to 5 AAC 35.508 that will continue to minimize risk of irreversible adverse effects on the *bairdi* crab resource, while providing a more sustainable supply of high quality *bairdi* crab products. This approach will benefit local and national markets, the various sectors of the crab fishery that operate in Alaska, Alaska residents, and the State of Alaska through both access to the fishery and the associated tax revenue.

We believe that 5 AAC 35.508 is in need of updating. As currently written, this harvest strategy constrains achievement of the economic benefits outlined in the Board's *Policy on King and Tanner Crab Resource Management* in years when female abundance is depressed but there are large surpluses of exploitable male *bairdi*. Perhaps most notably, key provisions of 5 AAC 35.508 such as definitions of mature female crab, and the long-term average time series for baseline abundance levels, are largely an artifact of the stock's 1998 overfished status when the harvest strategy was first promulgated. These provisions are also inconsistent with definitions and baseline averages used by the North Pacific Fishery Management Council's (NPFMC) Crab Plan Team (CPT) to inform the Federal stock assessment process.

Lack of a directed *bairdi* fishery during the 2016/2017 season was harmful to crab fishery participants, Alaska communities dependent on *bairdi* landings, and emerging markets for *bairdi*, especially with the following strong indicators of a sizeable harvestable surplus of male *bairdi* crab in the western subarea. These indicators included:

1. Above average catch per unit of effort (CPUE) indices since 2014 from the western subarea;

2. A westward shift in *bairdi* abundance as indexed by recent trawl survey studies that is correlated with warm sea surface temperatures in the eastern subarea;

3. A mature male biomass of 99.95 million lbs (the 5th highest throughout the survey time series since 1982) and an overall OFL of 56.46 million lbs and ABC/ACL of 45.17 million lbs; and

4. High bycatch rates of market legal *bairdi* in 2016/2017 directed Bering Sea snow crab fishery

We appreciate the evaluation completed by ADFG and support changes to the elements outlined in the board generated proposal; these revisions will affect how the female threshold is computed and how the penalty clause applies to the TAC in years following a fishery closure. We also support an alternative to the single open/close female abundance threshold, to facilitate flexibility in a male-only fishery and to accommodate survey variability over time. Overall, at some level of surplus males, there must be a way to have a conservative male fishery, irrespective of low female abundance. We support Board action on these items at the May 17–18 meeting.

We will also continue to advocate and support an open, transparent, and rigorous scientific analysis of the entire strategy in the near-term. This includes evaluating the efficacy of using a female threshold to manage a male-only directed *bairdi* crab fishery, given that no other *bairdi* fishery is managed with female abundance as state control rule (see Attachment 1), and with recognition of the multiple layers of conservation measures currently in place that establish OFLs and ABCs. However, we fully recognize the time constraints imposed on the Board and Department staff to prepare for this meeting and consider revisions in time for the 2017/2018 season. As such, we consider potential action on the provisions before the board as significant progress. This public comment is meant to provide some context and background to aid the board in evaluating any proposed revisions to the harvest strategy put forward by stakeholders or the Department.

II. Crab Management Framework

Bering Sea tanner crab is one of the 10 federal crab stocks that fall under the purview of the NPFMC's *Fishery Management Plan for Bering Sea/Aleutian Islands King and Tanner Crabs (FMP)*. The Crab Plan Team, composed of federal and state scientists, compiles an annual Stock Assessment and Fishery Evaluation (SAFE) report with contributions from the Department and the NMFS. Under this process, which incorporates specific fishery and data availability needs, the Crab Plan Team makes recommendations to the NPFMC's Science and Statistical Committee to determine the overfishing level (OFL) and allowable biological catch (ABC) limits for all 10 stocks, including tanner crab.

Each stock falls under one of five tiers based on the amount of information available on a given stock and the confidence in the data used to inform the stock assessment model. Stocks with excellent data are Tier 1, and stocks with little-to-no data are Tier 5. Each tier has specific built-in guidelines to account for uncertainty and mitigate the risk of harvesting crab at unsustainable levels. *bairdi* are classified as a Tier 3 stock. This means that there are prescribed buffers to

account for uncertainty between OFL and ABC. These buffers are in addition to the variables incorporated into the model itself to account for uncertainty. In short, the OFL and ABC are set at levels that incorporate the scientific uncertainty associated with the stock assessment model.

The information used to inform crab management decisions goes through two different processes: the stock assessment process used to set OFL and ABC described above and the state process used to set the annual total allowable catch (TAC). These are fairly disconnected processes despite the relationship between State and Federal management detailed in the FMP. The federal crab FMP defers to the state the responsibility for development of the harvest strategy and setting the annual TAC, subject to specific criteria of the FMP. Section 8.2.2. of the crab FMP authorizes ADFG to implement Category 2 management measures which are "framework-type measures that the state can change following criteria set out in the FMP". These criteria that the state must consider are as follows:

(1) Whether the ACL for that stock was exceeded in the previous year;

(2) Stock status relative to the OFL and ACL;

(3) Estimates of exploitable biomass**;**

(4) Estimates of recruitment;

(5) Estimates of thresholds;

(6) Market and other economic considerations;

(7) Additional uncertainty, which includes management uncertainty and additional scientific uncertainty. Management uncertainty is applicable in open access fisheries. Scientific uncertainty not already accounted for in the buffer between ABC and OFL levels encompasses uncertainty in bycatch mortality, estimates of trends and absolute estimates of size composition, shell condition, molt status, reproductive condition, spatial distribution, bycatch of non-target crab stocks, environmental conditions, fishery performance, fleet behavior, and the quality and amount of data available for these variables, and

(8) any additional factors pertaining to the health and status of the stock or the marine ecosystem.

III. History of the *bairdi* Tanner Crab management in the Bering Sea

The *bairdi* crab fishery has changed significantly since the harvest strategy was developed in 1999. Prior to 1996, much of the fleet fished in areas that are now encompassed by the Pribilof Islands blue king crab savings area, and as a result, closed to commercial fishing for *bairdi*. Combined with the areas closed East of 163 longitude there is an estimated 50% of the biomass inside protected areas. Therefore, the savings area constitutes a significant refuge segment of the

bairdi population insulated from intensive commercial fishing thereby reducing the risk of overexploitation of the stock.

Another protection designed to protect *bairdi* crab by reducing handling mortality was to increase the mesh size and escape ring requirements when fishing for *bairdi*. This change in the gear has allowed for sorting on the bottom by allowing for the female crab which tend to be smaller and the undersized crab to escape from the pots more readily. The result is a low-imapact directed *bairdi* fishery with exceptionally low discard rates of non-target portions of the *bairdi* crab stock.

Aside from the stock no longer being considered overfished and no longer being part of a rebuilding plan, we have learned many important things about the lifecycle and behavior of *bairdi* crab since the harvest strategy in use today was developed. Many of the items learned over the past 20 years could have influence on how we perceive the relative health of the Eastern Bering Sea *bairdi* crab stock, including:

1. Confirmation of a terminal molt

2. Westward shift of epicenter of *bairdi* abundance that is most pronounced in warm years.

3. Percentage of barren females remaining low irrespective of mature male abundance levels. This suggests female abundance and brood stock production while although limiting, are largely affected by factors independent of commercial exploitation.

4. Bycatch levels in other fisheries are accounted for and continue to diminish due to advances and regulatory changes in other fisheries.

5. Discard levels of females post-rationalization in the directed fishery remain very low.

6. There are trawl selectivity issues, particularly in terms of number of mature females captured by the survey, that have been elucidated via the paired BSFRF paired trawl studies.

The industry recognizes the highly cyclical nature of *bairdi* crab stocks and the inherent challenges this presents to the Department with respect to managing the fishery. Conversely, we also believe that when all the information is taken collectively, it suggests that more flexibility to harvest surplus males in years of below-threshold female abundance would present little risk to causing irrevocable harm to the resource while potentially providing a huge benefit to stakeholders and the state. One of the major benefits of the Board's policy on crab resources is to develop management regimes that minimize fluctuations in annual GHLs and TACs.

IV. Improving and updating the *bairdi* Tanner harvest strategy

The Board, ADFG, and the crab fishing industry began discussing the *bairdi* Tanner harvest strategy in fall 2016, and through a series of meetings in early 2017 agreed on harvest strategy

elements that could be analyzed and potentially amended prior to fishery status and TAC determination for the 2017/2018 fishing season.

RC 35, approved by the Board at the March 2017 Statewide King and Tanner Crab meeting, provides a description of harvest strategy elements considered highest priority for possible amendment in the May Board timeframe, relative to computation of the female threshold used to open the fishery:

a. Evaluate the designation of female maturity determination for existing calculation (criteria used to determine mature female Tanner crab (female size-at-maturity);

b. Evaluate the inclusion of crab west of 173° and/or other areas not currently included in the biomass estimate but for which survey data are consistently available

c. Evaluate using the same reference years as in the federal stock assessment (i.e., to estimate long-term average mature female biomass)

d. Penalty clause – re-evaluate the utility of the TAC penalty the following year (e.g. the TAC is reduced 50% in any year succeeding a year in which the mature female Tanner crab biomass falls below 40% of its long-term average).

e. Consider alternatives to a single open/close threshold (i.e., alternatives to the on/off switch to facilitate flexibility)

f. Male threshold – consider upper male threshold to determine harvestable surplus

Based on RC 35, the Department agreed that analysis of potential amendments to the first four harvest strategy elements (a – d) could be completed for a May 2017 special Board meeting with the intent for implementation prior to the 2017/2018 season. The ad hoc committee understands work is ongoing on the latter two critical elements (e and f) included in the RC approved by the Board, and information may also be provided to inform changes at the May meeting, but the status is more uncertain. RC 35 also requested that the Department review include a discussion of the appropriateness of a female threshold in light of other female conservation measures (e.g., male only fishery, no fishing during mating/molting, gear modifications), and the fact that other Tanner crab harvest strategies are predicated on aggregate mature biomass or mature males biomass.

The following is a discussion of the industry rationale for the identified potential changes in the tanner crab harvest strategy.

a. Evaluate the designation of female maturity determination for existing calculation.

When evaluating the criterion of female maturity used to determine mature female abundance relative to threshold levels, the industry supports defining female maturity based on abdominal flap morphology, or clutch presence observed during NOAA survey.

Currently, ADF&G defines "mature female" as ≥ 85 mm CW if east of 166° W long, and ≥ 80 mm CW in area 166° - 173° W long. Rather than using a carapace measurement width alone, it is more appropriate to use observed maturity to define mature female crab. In many instances, crab smaller than the current size cut off are observed with full clutches of fertile eggs. By including these crab in the stock assessment, the harvest strategy's definition of mature females would be in alignment with federal estimates of mature female abundance.

b. Evaluate the inclusion of crab west of 173° and/or other areas not currently included in the biomass estimate but for which survey data are consistently available.

ADF&G staff have stated that they believe Bering Sea tanner crab should be treated as a single stock. Industry representatives agree with this hypothesis. At the May Crab Plan Team meeting, staff noted that the most recent scientific literature suggests that there is little evidence of distinct genetic stock structure east and west of 173°, which supports the one-stock management approach. Given that there is little scientific evidence supporting two separate stocks, it would follow that the management of the single stock should include data from the entire survey area, not just east of 173°. The contribution of mature females west of 173° varies inter-annually, but has not been particularly strong in recent years.

c. Evaluate current year female and male mature biomass levels using the same time series of data used in the federal stock assessment process.

The industry supports adjusting the years for calculating biological reference points in the ADF&G harvest strategy so that they mirror those used by the NMFS. The current discrepancy between Federal and State years used for calculating reference points to inform the long-term average has been acknowledged by the Board as an issue with the current harvest strategy. Currently, ADF&G uses 1975–2010 as the reference years, while Federal scientists use 1982–2016. The latter time series was modified to 1982–2016 to better reflect the range of environmental conditions in the southern Bering Sea observed since the 1977 regime shift. Until conditions in the Bering Sea change dramatically, it is unlikely we will experience the high levels of recruitment that characterized the pre–1982 period. Additionally, the NMFS trawl survey switched gear in 1982 to a trawl sweep that was more efficient at catching groundfish (which is the primary target of the survey), but less efficient at catching crab than gear used in prior years. This means selectivity decreased in 1982 onward for crab, which most likely effectively skewed post–1982population estimates lower based on the raw survey area-swept data.

d. Penalty clause: re-evaluate the utility of the TAC penalty the following year

The industry supports reconsideration and removal of the arbitrary 50% TAC penalty following years with *bairdi* fishery closures. We are not aware of any other crab stock under the FMP managed with a harvest strategy that penalizes TACs in subsequent years based on a fishery closure the year prior. This provision seems unnecessary in subsequent years with high abundance of surplus males as indexed by survey data. Therefore, this provision has the potential to greatly reduce reasonable opportunity for commercial harvesters even when the *bairdi* resource appears healthy. We are fully aware that the TAC penalty provides an additional

buffer against survey error, and that following a closure, old shell males could comprise the bulk of the exploitable legal male population (≥5 inch carapace width (CW)), leading to disproportionate harvesting of industry-preferred new shells. However, as previously mentioned, there are already several buffers built into the OFL and ABC levels and harvest strategy that this provision seems excessively precautionary.

e. Consider alternatives to a single open/close threshold (i.e., alternatives to the on/off switch to facilitate flexibility)
f. Male threshold: consider upper male threshold to determine harvestable surplus

Industry recognizes that items e and f may not be formally considered at this meeting. Nonetheless, industry supports an interim measure that could be utilized in the upcoming management cycle that would allow for flexibility in what is anticipated to be another year of high male abundance paired with potentially below-threshold female abundance.

Harvesters recognize there is a minimum stock size threshold for females, below which the stock's productivity is impaired. Indicators of stress to females could include a significant increase in barren females observed in the trawl survey from the average, or an increase in the proportion of old shell mature females coupled with no discernible level of future recruitment, and/or a precipitous decline in female abundance below the range of observed abundance. It is noteworthy that there have not been any such indices of stress to the female population in the 43 years of trawl survey estimates. In summary, it would seem if there is a point at which we cannot afford any additional handling mortality to females; this level would be well below what we have already observed. Indirect evidence of this is the fact that the stock has recovered multiple times from female abundance levels well below the existing threshold level established by the current harvest strategy.

Stability in annual trawl survey female clutch fullness indices also calls into question the efficacy of even using an arbitrary female threshold trigger to set TAC levels of exploitable male tanner crab. Alternatively, we think it is more appropriate to view female abundance in terms of sex ratio. From a biological standpoint, we are concerned about the mating outcomes (e.g., fertilization rates, clutch fullness) of mature females at a full range of abundances given aspects such as distribution and survey gear selectivity. In theory, at lower female abundance, you would need fewer males and vice versa. It is interesting that in addition to stability in clutch fullness, the sex ratio has remained relatively stable despite exploitable male commercial harvest rates ranging from 2–79% from 1975–2015. Foregone harvest surpluses of tanner crab in years with above-threshold mature male abundance but below-threshold levels of female abundance underscore the urgency of revising the harvest strategy to bring it more into alignment with the board's policy.

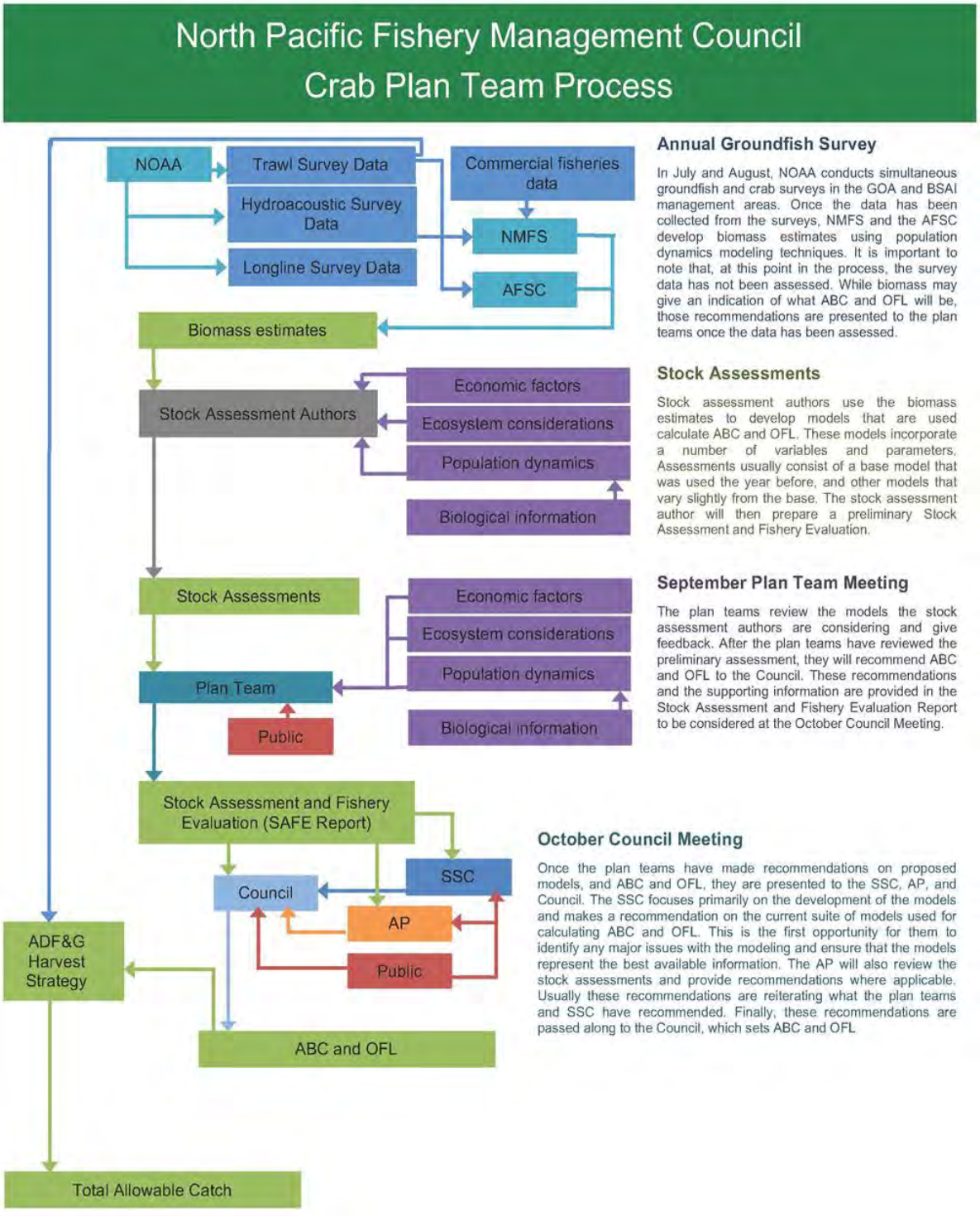
In March, the Board also supported continued assessment of the following issues, recognizing that these are part of a longer-term effort and would not be included in the evaluation provided to the Board in May. The ad hoc committee supports the continued assessment of these issues, and can provide input on these items when appropriate.

- Consider using selectivity data from the stock assessment
- Consider using stock assessment model outputs as the basis for the harvest strategy

- Evaluate existing additional conservation buffers (new shell/old shell selectivity)
- Evaluate alternative measures for the female abundance threshold (e.g., fertilization rate; egg production index; effective spawning biomass; total mature biomass)
- Continued dialogue with the Department, NMFS, BSFRF, and industry.

The industry strongly agrees that transparency, active participation, and collaboration in the fisheries management process are essential to achieving the goals outlined in the FMP. Improved dialogue between State, Federal, and other scientists would not only improve the TAC setting process and provide the opportunity for greater stakeholder involvement, but would ensure that the best available information is used to inform fisheries managers. This dialogue could help Federal scientists address some of ADF&G's concerns with the stock assessment model, and could allow for a more collaborative relationship moving forward. We appreciate Westward Region staff's efforts in this regard.

Attachment 1.



Attachment 2. Statewide Bairdi Tanner Harvest Strategies

- **Tanner Crab Summary** –

The Bering Sea Tanner crab (C. bairdi) harvest strategy appears to be the only Tanner bairdi crab fishery in the state of Alaska that applies a female threshold. However, the *C. opilio* threshold is tied to the combined biomass of morphologically mature male and female *C. opilio*. In an effort be conservative, the harvest rate calculations for both *C. bairdi* and *C. opilio* are also somewhat complex and not as transparent as many of the other harvest strategies in state regulation. The period of years (1975-2016) used for averaging historical *C. bairdi* biomass is inconsistent with the time period (1982-2016) deemed by the federal stock assessment models to best represent average stock productivity.

5 AAC 35.080. Harvest strategy. The Department shall establish an annual harvest strategy for each Tanner crab stock that is consistent with the board′s Policy on King and Tanner Crab Resource Management (90-04-FB, March 23, 1990), adopted by this reference. If adequate data are available, the department shall establish a threshold level of abundance for each stock and may not allow fishing on any stock that is below its threshold level of abundance. Data used to determine guideline harvest levels and, if appropriate, exploitation rates, may include estimates of exploitable biomass, estimates of recruitment, estimates of threshold level of abundance, estimates of acceptable biological catch, historical fishery performance data, estimates of reproductive potential, and market or other economic considerations. Except for those closures authorized by 5 AAC 35.035, the department may not change established harvest strategies unless the board has reviewed the change.

- **A – Southeast Alaska (5 AAC 35.100)**

Registration Area A is an exclusive registration area. The minimum stock threshold for a commercial Tanner crab fishery is 2.3 million pounds of mature male Tanner crab, measured as one-half of the long-term average (1997–2007) of mature male abundance. The initial harvest period in the “core” and “noncore” areas will be at least five days in length. Additional fishing days may be allowed based on the estimated biomass of mature male crab and the number of registered pots at the start of the fishery. At the end of the initial period, the core areas will close to fishing, and the noncore areas will remain open for an additional five days. The fishery is managed to minimize the spread, and to reduce the incidence, of bitter crab syndrome.

- **D – Yakutat Area (5 AAC 35.160)**

Registration Area D is a nonexclusive registration area. Male Tanner crab of the species *Chionoecetes tanneri* and *Chionoecetes angulatus* may be taken under the conditions of a commissioner’s permit.

The maximum annual allowable harvest for Tanner crab is 1.0 million pounds.

- **E – Prince William Sound Area (5 AAC 35.300) – NOTE – revised regulations not codified.**

Registration Area E is a superexclusive registration area. The following harvest strategy was adopted at the March 2017 Alaska Board of Fisheries meeting.

The fishery threshold is a preseason estimated abundance of 200,000 male crab ≥135 mm (5.3 inches) CW. This threshold is 50 percent of the long-term average of male crab ≥135 mm CW and a proxy for the biomass at maximum sustained yield. In addition, if the commercial fishery has been closed for more than two consecutive years, then the estimated abundance must be ≥200,000 male crab ≥135 mm CW for more than one year before the commercial fishery may open. The commercial guideline harvest level is a stepped harvest rate ranging from 15 percent to 25 percent of the abundance of male crab ≥135 mm CW. However, the legal size is male crab ≥127 mm CW.

- **H – Cook Inlet Area (5 AAC 35.400)**

Registration Area H is a superexclusive registration area and includes the Southern, Kamishak, and Barren Island Districts.

In the Southern District, the minimum stock threshold for the commercial fishery is 500,000 legal male Tanner crab. The harvest rate for the commercial and noncommercial fisheries combined ranges from 15 percent to 25 percent, depending on legal male abundance.

In the Kamishak and Barren Islands Districts, combined, the minimum stock threshold for the commercial fishery is 700,000 legal male Tanner crab. The harvest rate for the commercial and noncommercial fisheries combined ranges from 15 percent to 25 percent, depending on legal male abundance.

- **J – Westward Area (5 AAC 35.500)**

Registration Area J is a nonexclusive registration area, except the Kodiak and Chignik Districts are superexclusive registration districts. In the Kodiak, Chignik, and South Peninsula Districts, a commercial Tanner crab fishery may open only if analysis of preseason survey data indicates that the subject population meets or exceeds the threshold level of mature male abundance specified as one-half of the long-term average of mature male abundance in a district or sections of a district. Calculation of the guideline harvest level varies among districts or sections of districts, is tied to mature male abundance, and is calculated as no larger as a specified percentage of molting mature male abundance or legal male abundance. Mature male abundance is the abundance of male Tanner crab > 114 mm CW; molting mature male abundance is abundance of 100% of newshell, and 15% of oldshell Tanner crab >114 mm CW.

- **5 AAC 35.508. Bering Sea District *C. bairdi* Tanner crab harvest strategy.**

In the Bering Sea District, the commercial Tanner crab fishery may open only if preseason survey data indicates the population at the time of the survey is ≥ 40 percent of the long-term average (1975–2010) of mature female crab biomass in the Eastern Subdistrict. Mature female

crab means females >84 mm CW east of 166° W. long. and >79 mm CW if west of 166° W. long. Depending on the relationship of current biomass to average biomass during 1975-2010 for males >112 mm CW if east of 166° W. long and > 102 mm CW if west of 166° W. long., the harvest rate in each respective area varies from 0 (closed) to a maximum of 0.9 times the potential catch of male crab ≥127 mm CW at the time of mating., except that the catch may not exceed 50% of the unfished biomass. In addition, if the female threshold was not met and the fishery did not open the previous year, the allowable catch is reduced by one half.

- **5 AAC 35.509. Eastern Aleutian District Tanner crab harvest strategy.**

The a commercial Tanner crab fishery may open only if preseason survey data indicate that the subject population meets or exceeds the threshold level of mature male abundance, specified as one-half of the long-term average of mature male abundance, and the fishery is in a section of the Eastern Aleutian. The harvest rates varies with stock abundance, is specified as the maximum of a percentage of mature male abundance or of legal male abundance, and must be able to support a guideline harvest level of 35,000 pounds. Mature male abundance is defined as abundance of male Tanner crab >114 mm CW; molting mature male abundance is estimated as 100% of newshell, and 15% of oldshell >114 mm CW.

- **5 AAC 35.517. Bering Sea *C. opilio* Tanner crab harvest strategy**

The commercial *C. opilio* Tanner crab fishery may open if preseason survey data indicate an estimated spawning biomass of ≥25 percent of B_{msy}, where B_{MSY} is the population biomass of combined mature and female *C. opilio* Tanner crab that could produce MSY. The tot's allowable catch is calculated from mature male spawning biomass, F_{MSY} (the fishing mortality rate that would produce MSY), and possibly B_{MSY} depending on stock status. Total allowable catch will not exceed 58% of exploited legal males. Estimated mature male biomass is the estimated biomass of all morphometrically mature male *C. opilio*; estimated spawning biomass is the estimated biomass of all morphometrically mature male *C. opilio*, and all morphometrically mature female Tanner crab; and exploited legal males is 100% of the newshell plus a percentage of oldshell male *C. opilio* ≥102 mm CW.