RE: PROPOSAL 65 Close the Katmai, Alinchak, and Cape Igvak Sections to commercial salmon fishing June 28–July 25

December 24, 2019 Alaska Board of Fisheries Board Support Section P.O. Box 115526 Juneau, AK 99811-5526 Re: Opposition to Proposal 65 Dear Chairman Morisky and Board of Fisheries Members, I am Steve Roth, Kodiak and Lower Cook Inlet salmon purse seine permit holder. Thank you for the opportunity to comment on proposals for the Kodiak finfish meeting. My wife and I reside in Homer, but fish in Kodiak. I own and operate the F/V Sea Grace. We rely solely on salmon seining for our livelihood and annual income to support our business, our family and contribute to our Alaskan economy through business and personal expenditures. This proposal appears to be in response to an anomaly that occurred in fish migration patterns during 2016, and the proposer wants to bring up the genetic study as justification as need for change. Kodiak's North Shelikof Management Plan was created so that Kodiak fishermen would share the "conservation burden" with Cook Inlet by limiting fishing in that area so the goal of UCIDA's proposal is already addressed in current management. The genetic sockeye identification study undertaken in the Kodiak Management Area from 2014-16 really does not provide "new" information relative to the presence of Cook Inlet sockeye in the KMA, and is completely taken out of context because it only looked at sockeye rather than the full suite of salmon species that we fish for in Kodiak. This proposal would restrain fishing allowed during times of the Cape Igvak Management, which would make it difficult to reach Kodiak's traditional and historical 15% allocation which the Chignik proposals claim belong to Chignik, and Cook Inlet proposals, on the contrary, claim as their own. It would also prevent the ability to fish some areas as directed chum and early pink fisheries for Kodiak fishermen resulting in lost revenue and opportunity for our region. Instead of an attempt to restructure the fisheries in a neighboring region, the Board's time would be better spent investigating the number of years the Kenai and Kasilof rivers have exceeded their escapement, and yet Cook Inlet drift-gillnetters and set-gillnetters still have minimal fishing time when in other regions there would be emergency openings to maintain the health of fish stocks and the rivers. For example, 2019 was a banner year, and yet commercial fishermen were forced to sit on their hands while the Kenai and Kasilof rivers were over-escaped by the hundreds of thousands. I strongly encourage the Board to reject this proposal. Steve and Jenny Roth F/V Sea Grace Homer, AK

Tollef Monson

12/25/2019 06:56 PM AKST

RE: PROPOSAL 65 Close the Katmai, Alinchak, and Cape Igvak Sections to commercial salmon fishing June 28–July 25

reference unsound data

Adelia Myrick

12/25/2019 06:16 PM AKST

RE: PROPOSAL 37 Create a king salmon management plan with paired restrictions in Kodiak and Cook Inlet commercial fisheries

Dear Board of Fish members, I am a second-generation Kodiak fisherman. My father started salmon fishing here in 1967, and I have setnetted since I was a toddler with my family, for my whole life. I took over the permit from my dad several years ago, and in 2016 finally bought the setnet operation from my parents outright. I am opposed to this proposal because, the way it is written, it seems like it would harm al users. Before creating a comprehensive Gulf chinook management plan, I think we need much more study on genetics, where the chinook actually are, and where they are bound. This is because assessments from trawl bycatch show that up to 90% or more of the chinook are originating from the west coast and other areas. If we curtail ourselves, it would be to the detriment of all fishers without necessarily actually helping local stocks. I am in favor of conservation and managing the fishery for sustainability in perpetuity, but it should be based on hard science, not speculation. We need more information to make these kinds of decisions. Thank you for your consideration, Adelia Myrick

December 24, 2019

Alaska Board of Fisheries
Board Support Section
P.O. Box 115526
Juneau, AK 99811-5526

Re: Opposition to Proposal 37

Dear Chairman Morisky and Board of Fisheries Members,

I am Alex Roth, Kodiak salmon purse seine and Lower Cook Inlet salmon purse seine permit holder and thank you for the opportunity to comment on proposals for the Kodiak finfish meeting. My wife and I reside in Homer, but fish in Kodiak mainly. I own and operate the F/V Wandering Star. We rely solely on salmon seining for our livelihood and annual income to support our business, our family and contribute to our Alaskan economy through business and personal expenditures.

I oppose proposal 37 because it works from an assumption that Kodiak does not have its own Chinook stocks and existing Chinook restrictions. It also ignores Cook Inlet and Kodiak sportfish harvests of Chinook salmon. This proposal asks to shut down a significant portion of Kodiak's historical commercial salmon fishery that has a successful and complex biology-based management plan in order to possibly save 250-270 fish versus the tens of thousands of fish from local sockeye, pink, coho and chum stocks. This proposal could have devastating impact on the sustainability of Kodiak stocks, statewide fishing businesses and the Kodiak communities in which the majority of these fish are landed and processed. I would also like to *remind the Board and the author of this proposal that Kodiak's commercial salmon fishery already has a non-retention policy for Chinooks 28 inches or greater in length*.

I see no reason that could justify the Board making any changes to Kodiak's salmon management plans and ask that you reject proposal 37.

Thank you for your careful consideration of this matter,

Alex and Jaime Roth
Homer, AK

RE: PROPOSAL 37 Create a king salmon management plan with paired restrictions in Kodiak and Cook Inlet commercial fisheries

Bo Calhoun 57177 Zulu Ct. Homer, AK 99603 12/26/19 RE: Opposition to Proposal #37 Dear Chairman Morisky and Board of Fish members: I'm a third generation Kodiak salmon seiner. I was born in Homer, raised in Port Lions and Homer, and continue to live in Homer. My wife and I hope to raise our two sons on our family seine boat in a healthy Kodiak salmon fishery. I respectfully request the Board reject Proposal #37. The very few Cook Inlet chinook that would be protected by this proposal does not justify the harm it would do the Kodiak salmon fishery. Please reject proposal #37. Thank you for taking the time to read public comments. Sincerely, Bo Calhoun

Brian mcwethy
KSA
12/23/2019 07:56 AM AKST

RE: PROPOSAL 37 Create a king salmon management plan with paired restrictions in Kodiak and Cook Inlet commercial fisheries

My name is Brian Mcwethy. I was born and raised in kodiak. I live in kodiak with my family and we all depend on my income. I fished with my father on his seiner growing up and now I own and operate a seiner. Salmon seining and tanner crab fishing in kodiak are currently our only sources of income. I plan to try and continue to fish the kodiak waters and possible my children will have the opportunity to. I hope the current and historical areas we fish aren't taken from us and the future generations of kodiak. That is why I oppose this amendment.

December 22, 2019

Alaska Board of Fisheries
Board Support Section
P.O. Box 115526
Juneau, AK 99811-5526

Re: Opposition to Proposal 37

Dear Chairman Morisky and Board of Fisheries Members,

My name is Chris Johnson and I am a second-generation fisherman in Kodiak, Alaska. I grew up fishing on my dad's boat and got my first crew job working for someone else two weeks after I graduated high school. I haven't missed a salmon season since. I bought into the fishing industry in 2011 with the purchase of a 25-foot jig boat that I worked for two years in the winter and spring months while I still crewed for salmon in the summer. Access to the jig fisheries focusing on cod and rockfish was the only way that I could afford to move into the salmon fleet with a 38-footer in 2013. After the recent cod collapse I now primarily rely on salmon seining and live here year-round with my wife.

I oppose proposal 37 because it 1) is extremely vague and provides no regulatory language to comment on; 2) ignores Cook Inlet and Kodiak sportfish harvests of Chinook salmon; 4) presumes there are no Kodiak Chinook stocks; 5) asks to shut down without justification a significant portion of Kodiak's long-standing historical fishery that has a concrete and highly complex management plan and; 6) lastly the Kodiak commercial salmon fishery already has a non-retention policy in place for Chinooks 28 inches or greater in length.

Chinook stocks are depressed across the Gulf of Alaska. Reducing Kodiak's salmon fishery because of Chinook concerns is unlikely to impact southcentral Alaska Chinook resources as suggested by the author of this proposal and would instead cause devastating economic impacts in the Kodiak commercial salmon fishery due to lost opportunity to harvest sockeye, pink, silver, and chum salmon. Furthermore, I feel that Kodiak as a regional community stands to lose the most from anything resulting from this proposal and it does not seem like the best public process to hold the final deliberation at the UCI meeting where it will be very difficult for Kodiak community members to attend and participate.

Taking away any fishing opportunity from Kodiak fishermen, particularly from the small boat fleet, would have a direct negative impact on new entrants trying to gain a foothold in this industry, fishing families trying to get by, and fishing support businesses in our region. I'm proud to call Kodiak home and am working to protect our fishing way of life.

Sincerely,
Chris Johnson
F/V North Star

Cole C Christiansen
F/V Mary Ann
12/23/2019 11:30 AM AKST

RE: PROPOSAL 37 Create a king salmon management plan with paired restrictions in Kodiak and Cook Inlet commercial fisheries

Pairing Kodiaks management plan with Cook Inlet would shut down Kodiak at times when our management plan needs pinks and sockeye caught so that our systems are not over escaped. Furthermore the best way to encourage fishermen to save the king salmon would be to incentivise them instead of restricting them.

Corina Watt, Commercial Kodiak Salmon Setnet Fisherman
Trap Point/ Moser Bay Fisheries: Fish in the Alitak District with sites in Olga, Moser and Alitak Bays
12/25/2019 08:31 PM AKST

RE: PROPOSAL 37 Create a king salmon management plan with paired restrictions in Kodiak and Cook Inlet commercial fisheries

I oppose PROPOSAL 37 5 AAC 18.XXX. To create a king salmon management plan with paired restrictions in Kodiak and Cook Inlet commercial fisheries for the following reasons: Managing Kodiak for non-local salmon stocks creates the following: 1) It increases gear conflict and creates reallocation scenarios. 2) It reduces the quality and viability of more than a dozen Kodiak sockeye systems. 3) It reduces harvest opportunities of local stocks creating economic hardships for Kodiak fishers. 4) It may create biological concerns threatening the Kodiak sockeye systems.

December 22, 2019

Alaska Board of Fisheries
Board Support Section
P.O. Box 115526
Juneau, AK 99811-5526

Re: Opposition to Proposal 37

Dear Chairman Morisky and Board of Fisheries Members,

My name is Danielle Ringer and I appreciate the opportunity to comment on proposals before the Board in writing and in person for the Kodiak finfish meeting. I live in Kodiak with my husband and we own and operate the 38-foot F/V North Star. We chiefly rely on salmon seining and cod and rockfish jigging to maintain our fishing way of life and ability to live on Kodiak Island. I grew up in Homer learning to harvest and process fish from my parents in Kachemak Bay and dipnetting on the Kenai River. I hold a Master's degree from the University of Alaska Fairbanks in Political Ecology of Fisheries and was one of the researchers on the *Graying of the Fleet in Alaska's Fisheries: Defining the Problem and Assessing Alternatives* study in the Kodiak region.

I oppose proposal 37 because it 1) is extremely vague and provides absolutely no regulatory language to comment on; 2) ignores Cook Inlet and Kodiak sportfish harvests of Chinook salmon; 4) presumes incorrectly that there are no Kodiak Chinook stocks; 5) asks to shut down without justification a significant portion of Kodiak's long-standing commercial historical fishery that has a concrete and highly complex management plan and; 6) lastly the Kodiak commercial salmon fishery already has a non-retention policy in place for Chinooks 28 inches or greater in length.

Chinook stocks are depressed across the Gulf of Alaska. Reducing Kodiak's salmon fishery because of Chinook concerns is unlikely to impact southcentral Alaska Chinook resources as suggested by the author of this proposal and would instead cause devastating economic impacts in the Kodiak commercial salmon fishery due to lost opportunity to harvest sockeye, pink, coho, and chum salmon. Furthermore, I feel that Kodiak as a regional community stands to lose the most from anything resulting from this proposal and it does not seem like the best public process to hold the final deliberation at the UCI meeting where it will be very difficult for Kodiak community members to attend and participate.

I see no biological, scientific, historical, economic, nor sociocultural reasons that could justify the Board making any changes to Kodiak's salmon management plans. Thank you for your consideration of my comments and I look forward Board of Fisheries members spending time in our fishing community during the Kodiak meeting.

I humbly request the Board to reject this proposal.
Respectfully,
Danielle Ringer, M.A.
F/V North Star

Dave Kubiak
F/V Lara Lee
12/21/2019 02:54 PM AKST

RE: PROPOSAL 37 Create a king salmon management plan with paired restrictions in Kodiak and Cook Inlet commercial fisheries

This proposal would shut down a significant portion of our salmon fishery during June and July. This interferes with our well established and well crafted salmon management plan.

Donald Lawhead

12/26/2019 11:08 PM AKST

RE: PROPOSAL 37 Create a king salmon management plan with paired restrictions in Kodiak and Cook Inlet commercial fisheries

Creating new mangement plans for chinook salmon would further burden the ADFG with shrinking budgets.

Ed Fisher, Kodiak Salmon Setnet Commercial Fisherman
Trap Pt/ Moser Bay Fisheries: Alitak District with sites across Olga, Moser and Alitak Bays
12/25/2019 10:23 PM AKST

RE: PROPOSAL 37 Create a king salmon management plan with paired restrictions in Kodiak and Cook Inlet commercial fisheries

I am opposed to PROPOSAL 37 5 AAC 18.XXX. New section. Create a king salmon management plan with paired restrictions in Kodiak and Cook Inlet commercial fisheries, for the following reasons: 1) It increases gear conflict and creates reallocation scenarios. 2) It reduces the quality and viability of more than a dozen Kodiak sockeye systems. 3) It reduces harvest opportunities of local stocks creating economic hardships for Kodiak fishers. 4) It may create biological concerns threatening the Kodiak sockeye systems.

Iver Holm

12/28/2019 12:31 AM AKST

RE: PROPOSAL 37 Create a king salmon management plan with paired restrictions in Kodiak and Cook Inlet commercial fisheries

Dear Chairman Morisky and Board of Fish members: I am 31 years old and a life long resident of Kodiak. I grew up set netting in Uganik on the west side of the island with my mother until i was 14. I then started seining with my father until I was able to buy my own Kodiak seine operational the age of 27. Please oppose proposal 37. thank you for your time sincerely
Iver Holm

Jamin Hall

12/27/2019 10:54 PM AKST

RE: PROPOSAL 37 Create a king salmon management plan with paired restrictions in Kodiak and Cook Inlet commercial fisheries

My name is Jamin Hall, my wife and I have a set net site in Uganik Bay. I am writing in opposition to proposal 37. It seems to be an outlandish proposal with no basis in fact. The only information I know of is from gulf trawl fisheries bycatch studies which indicate over 90% of the kings in the gulf are from British Columbia and the US west coast. If this is correct, then fisheries in both Kodiak and Cook Inlet would suffer and the local kings would not be helped more than fractionally.

Jason Watt, Kodiak Salmon Setnet Commercial Fisherman
Trap Pt/ Moser Bay Fisheries: Alitak District with sites in Olga, Moser & Alitak Bays
12/25/2019 08:37 PM AKST

RE: PROPOSAL 37 Create a king salmon management plan with paired restrictions in Kodiak and Cook Inlet commercial fisheries

I oppose PROPOSAL 37 5 AAC 18. To create a king salmon management plan with paired restrictions in Kodiak and Cook Inlet commercial fisheries for the following reasons: Managing Kodiak for non-local salmon stocks creates the following: 1) It increases gear conflict and creates reallocation scenarios. 2) It reduces the quality and viability of more than a dozen Kodiak sockeye systems. 3) It reduces harvest opportunities of local stocks creating economic hardships for Kodiak fishers. 4) It may create biological concerns threatening the Kodiak sockeye systems.

Jonathan Edwards

12/27/2019 09:03 AM AKST

RE: PROPOSAL 37 Create a king salmon management plan with paired restrictions in Kodiak and Cook Inlet commercial fisheries

I am a gill netter on the Westside of Kodiak Island. While it is a well established fact of the travel patterns and incidental catch of Cook Inlet bound sockeye in the KMA, there is no data I know of supporting pairing King restrictions of the Cook Inlet commercial fisheries. The King catch data of the KMA is there, but it is pretty much meaningless in this situation. This data includes Kings originating from Kodiak, as well as the rest of Alaska and Canada and the US west coast. On top of that, travel patterns of the King salmon do not mimic the Cook Inlet bound sockeye. Where are the Cook Inlet kings coming from? West, east, or south. Where's the data on this. This proposal is backed up by nothing. I can testify to one thing on this issue. i catch very few kings through out my salmon season. They are scattered out pretty evenly through my salmon season. I have never witnessed anything resembling a King run, and I have been doing this for 40 years.

Judy Fisher, Kodiak Setnet Salmon Commercial Fisherman
Trap Pt/ Moser Bay Fisheries: Alitak District with sites across Olga, Moser & Alitak Bays
12/25/2019 10:25 PM AKST

RE: PROPOSAL 37 Create a king salmon management plan with paired restrictions in Kodiak and Cook Inlet commercial fisheries

I am opposed to PROPOSAL 37: 5 AAC 18.XXX. New section. Create a king salmon management plan with paired restrictions in Kodiak and Cook Inlet commercial fisheries, for the following reasons: 1) It increases gear conflict and creates reallocation scenarios. 2) It reduces the quality and viability of more than a dozen Kodiak sockeye systems. 3) It reduces harvest opportunities of local stocks creating economic hardships for Kodiak fishers. 4) It may create biological concerns threatening the Kodiak sockeye systems.

Ken Christiansen
F/V Mary Ann
12/26/2019 01:34 PM AKST

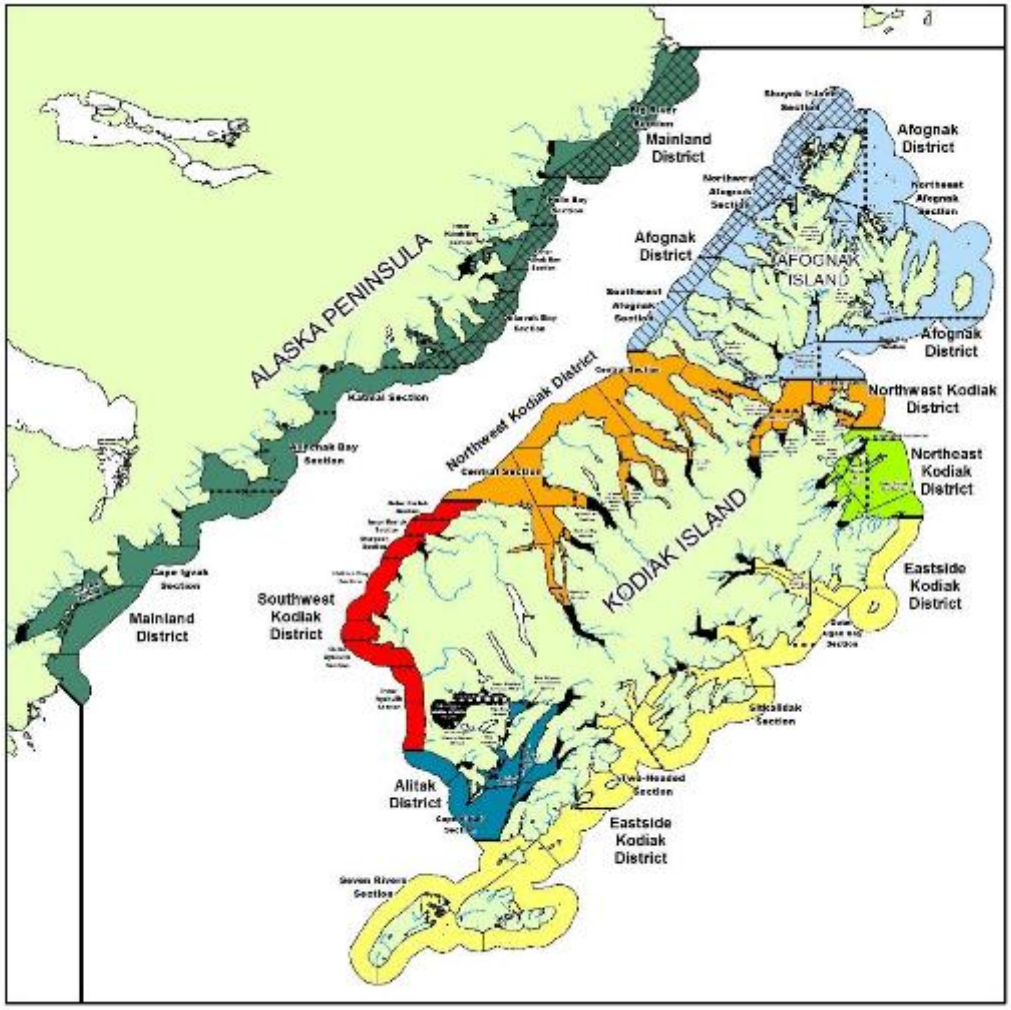
RE: PROPOSAL 37 Create a king salmon management plan with paired restrictions in Kodiak and Cook Inlet commercial fisheries

The relatively few Kings that might be saved (250-270) do not justify closing down Kodiak's long standing historical fishery with a concrete and complex management plan.why would we close down the entire fishery for a couple of Kings, that makes no sense to me, very counter productive.

Kevin Fisher
Alitak District Setnet Fisherman
12/27/2019 08:39 PM AKST

RE: PROPOSAL 37 Create a king salmon management plan with paired restrictions in Kodiak and Cook Inlet commercial fisheries

I can't see how this proposal solves or serves any conservation issues. It is simply trying to limit one fishery for the benefit of another. Further more the proposal suggests a problem where none exists.



Comments on Proposal 37 and RC 09, an Amendment to Proposal 37

by the Kodiak Salmon Work Group
December 2019

Comment:

We have only recently become aware that a potentially sweeping and devastating proposal to overhaul salmon fishery management plans in the Kodiak management area (KMA) has been put out for public comment. This is what is called RC 09, which was submitted by the public at the end of the Board of Fisheries meeting earlier this month for Lower Cook Inlet. It apparently is to be considered an amendment to Proposal 37, which had been submitted by a different member of the public prior to the proposal deadline for this 2019-2020 board cycle last April.

Our initial focus is on the extremely poor public process used in putting RC 09 out for public comment. At the recent meeting of the board, in Lower Cook Inlet, RC 09 was submitted as an amendment to Proposal 37, by someone other than the original proposer. With great hubris, the United Cook Inlet Drift Association stated that, "If proposal 37 is revised as indicated below, UCIDA may support such a plan…" and then UCIDA completely overwrote Proposal 37 to include even more management areas, more species, and more fisheries with an apparent presumption that if UCIDA, a single stakeholder group, were to "support" the plan then it would have credibility and merit the Board's submission as substitute language. At the behest of a single board member, RC 09 was then put out for public comment.

The request and opportunity for the public to comment on RC 09 was posted on the board's public comment page on December 14, a mere 13 days before the public comment deadline for the Kodiak board meeting. Worse still, the invitation to comment is listed solely on a portion of the board's website that is accessible only if a person knows already that they wish to make a public comment; RC 09 is not acknowledged or listed as a proposal or a report on the webpage that applies to the Kodiak meeting, so most members of the public would not even become aware of its existence.

Proposal 37

Regarding the substance, Proposal 37 itself is of dubious merit and because of its vagueness lacks any utility. It is meant to apply to two separate management areas (Cook Inlet and Kodiak) yet it provides no proposed regulatory language nor any specific guidance on how each or both management areas should be regulated. Rather, it provides a single, general sentence that both areas should "be managed under a single comprehensive king salmon conservation plan which functions to conserve kings in both locations." This isn't a meaningful

proposal for regulatory change; rather it is goal statement with no set of objectives nor any thoughtful mechanism for how to attain the stated goal. Proposal 37 shows a minimum of effort on the part of the proposer, but would require huge amounts of effort on the part of the board and regulators to craft possible language, and then even larger amounts of effort on the part of affected fishermen to debate, support, or oppose any such comprehensive management plan.

Adding to the difficulty of considering the original Proposal 37 is that it was scheduled to be heard at three different board meetings (LCI, Kodiak, and UCI), but any real deliberation or action would occur at the Upper Cook Inlet meeting even though any such action would affect Kodiak area fisheries moreso than any of the others. Under previous board process, any proposal that was so sweeping and encompassed more than one management area would be fleshed out in much more detail and would have been available for much more substantial opportunities for public comment and debate. Because proposal 37 is without substance, would require great effort on the part of the department and the board to develop and does not provide enough detail for stakeholders to adequately comment, Proposal 37 does not deserve serious consideration by the board.

RC 09

But, adding considerable insult to injury, the board itself has now embarked upon a path far beyond Proposal 37 which only amplified Proposal 37's lack of substance and inadequate public notice. Even if members of the public become aware of RC 09, it is not clear what we should make of it. Why is it needed? What problem did the board have in mind? Who will develop the detail for a new "multi-area" management plan? By including sockeye, coho, chum and pink salmon does the proposal envision that salmon species will be managed independently or inter-dependently. If the plan is intended to be comprehensive, why is all the regulatory language that follows focused only on the Kodiak area? With these immediate questions and a host of related issues, the public is left with no position but opposition.

The language in RC 09 is overly-broad, and unnecessarily repeats directives embedded in other regulations such as the Mixed Stock Salmon Fisheries Policy, the Sustainable Salmon Fisheries Policy, various subsistence requirements and as well as emergency order authorizations. It also purports to alter KMA management plans in order to support and protect "salmon stocks and species" in Area L-Chignik, Area H-Cook Inlet, and Area K-Kodiak but

provides no proposed mechanism to do so. In essence, RC 09 appears to be a proposed mini-Mixed Stock policy that would apply to one management area with criteria derived from stock status, habitat quality, and assorted fisheries in other management areas.

Summary

RC 09 proposes a substantial departure from current or established practice in Alaska salmon management without providing any indication on how it would achieve its poorly stated objectives.

For the board to put forward for public comment such an awkward, sweeping, and poorly developed amendment submitted by one segment of the public to someone else's proposal, on the basis of the desire of a single board member, less than two weeks before the close of public comments for a board meeting on the affected fisheries, and posted solely in a section of the board's webpage that many constituents will not know to access … is irresponsible.

RC 09, and Proposal 37, should be rejected. And, the Board of Fisheries should make a substantial public commitment to the effect that only thoroughly thought-out, well-articulated proposals will be considered in the future, especially if the intent is to substantially effect change in longstanding fisheries; all such proposals need to be made readily available, and for significant amounts of time, for public comment and board deliberation.

December 24, 2019

Matthew Alward

60082 Clarice Way

Homer, AK 99603

Alaska Board of Fisheries
Board Support Section
P.O. Box 115526
Juneau, AK 99811-5526

RE: Opposition to proposal 37

Dear Chairman Morisky and board of fisheries members,

I live in Homer, AK and run my own boat in the Kodiak salmon seine fishery and I oppose proposal 37 that would create a new Kodiak management plan with paired restrictions tied with Upper Cook Inlet king salmon abundance. I raised our kids on the back deck of our family seiner and support the family in this fishery and if enacted this proposal would create very negative consequences for the Kodiak salmon fishery.

The proposer claims that Kodiak salmon fishermen are "slaughtering Cook Inlet origin king salmon". According to Fishery Manuscript Series No. 16-11 titled "Genetic Stock Composition of the Commercial and Sport Harvest of Chinook Salmon in Westward Region, 2014-2016" tables 41, 42, and 43, of the total Kodiak king salmon harvest only 3.6% annually are from Cook Inlet origin stocks which works out to an average of 260 Cook Inlet origin king salmon per year. I light of the fact that only 260 Cook Inlet king salmon a year are harvested in Kodiak I would say that the accusation that we are "slaughtering Cook Inlet origin salmon" is quite false.

To throw away the almost 50 year old Kodiak management plans in order to try to pass 260 kings a year towards Cook Inlet I believe would be irresponsible salmon management. Kodiak has numerous sockeye, chum, pink, and coho salmon systems with quite variable run timings that the management plans account for in order to harvest local Kodiak stocks. These plans are very complex and proposal 37 asks to replace them to protect 260 king salmon but gives no suggested language to accomplish this goal. If the board chose to adopt this proposal there would be substantial work for department staff to create a new management plan.

In closing I ask that you do not upend decades old management plans that are working well for the management objectives that they are designed for and do not adopt proposal 37.

Sincerely,

Matthew Alward

Nicholas Hoffman
PO Box 1212
Kodiak, AK 99615

12/24/19

Chairman Reed Moriskey
Alaska Board of Fisheries
Board Support Section
P.O. Box 115526
Juneau, AK 99811-5526

RE: **Oppose Proposal 37**

Dear Chairman Morisky and Board of Fish members:

I'm a young Kodiak salmon fisherman. I have been running a seine boat since 2011 as well as participating in Kodiak halibut, sea cumber, cod jig, and tanner crab fisheries. I respectfully request the Board reject Proposal 37

I oppose this proposal because it would shut down a significant portion of our fishery during June and July. Kodiak already has non-retention of kings which has significantly reduced the king catch in the Kodiak area. The few hundred kings that could possibly be saved by this proposal aren't worth risking over-escapeing streams in the rest of the Kodiak area.

I see no reason for the Board to make any changes to the Kodiak Salmon Management plan. Thank you for the opportunity to comment on the proposals and the chance for my voice to be heard. I look forward to the Board of Fish members getting to spend time in Kodiak and learn more about our town and fishing community.

I humbly request the Board reject Proposal 37.

Sincerely,

Nicholas Hoffman
F/V Relentless

Oliver Holm
self
12/27/2019 12:43 PM AKST

RE: PROPOSAL 37 Create a king salmon management plan with paired restrictions in Kodiak and Cook Inlet commercial fisheries

There is no equivalence between the Upper Cook Inlet commercial fishery chinook catches and the chinook caught in the Kodiak commercial harvest. The chinook caught in Upper Cook Inlet are predominately adults returning to spawn in Inlet drainages. The chinook incidentally caught in the Kodiak commercial fisheries are primarily feeders many of which are of hatchery origin from Canada, Washington and Oregon. Very few originate from Cook Inlet rivers. This is known because of coded wire recoveries and genetic sampling. The Kodiak area salt water sport fish catches are also of this same composition.

December 24, 2019

Alaska Board of Fisheries
Board Support Section
P.O. Box 115526
Juneau, AK 99811-5526

Re: Opposition to Proposal 37

Dear Chairman Morisky and Board of Fisheries Members,

I am Richard Roth, Kodiak salmon purse seine permit holder. Thank you for the opportunity to comment on proposals for the Kodiak finfish meeting. My wife three children and I reside in Homer, but fish in Kodiak. I owned and operated the F/V Kelly Girl which I sold this winter and Purchased the F/V Sea Tzar which i will be fishing in Kodiak for the forseeable future. We rely solely on salmon seining for our livelihood and annual income to support our business, our family and contribute to our Alaskan economy through business and personal expenditures.

I oppose proposal 37 because it works from an assumption that Kodiak does not have its own Chinook stocks and existing Chinook restrictions. It also ignores Cook Inlet and Kodiak sportfish harvests of Chinook salmon. This proposal asks to shut down a significant portion of Kodiak's historical commercial salmon fishery that has a successful and complex biology-based management plan in order to possibly save 250-270 fish versus the tens of thousands of fish from local sockeye, pink, coho and chum stocks. This proposal could have devastating impact on the sustainability of Kodiak stocks, statewide fishing businesses and the Kodiak communities in which the majority of these fish are landed and processed. I would also like to *remind the Board and the author of this proposal that Kodiak's commercial salmon fishery already has a non-retention policy for Chinooks 28 inches or greater in length*.

I see no reason that could justify the Board making any changes to Kodiak's salmon management plans and ask that you reject proposal 37.

Thank you for your careful consideration of this matter,

Richard, Amanda, Stephanie, Noah and Ranger Roth
F/V Sea Tzar
Homer, AK

December 19, 2019

Robert Fellows

266 E Bayview Ave.

Homer, AK. 99603

Alaska Board of Fisheries

Board Support Section

PO Box 115526

Juneau, Ak. 99811-5526

RE: Opposition to proposal 37

Dear Chairman Morisky and Board of Fisheries members,

I am a commercial fisherman who resides in Homer and depends on the Kodiak area commercial salmon fishery to support my family. I have commercially fished salmon in the Kodiak area for 29 years and hope to continue to do so. My crewmembers also reside in Homer and depend on this fishery for their income. This proposal would drastically affect my ability to continue to make a living commercial fishing. I respectfully request the Board reject proposal #37

This proposal, if passed, would drastically restrict fishing time in the Kodiak management area in June and July. This would prohibit the ability of the Kodiak Fish and Game staff to properly manage local stocks. Kodiak commercial salmon fishermen are already required to release king salmon over 28 inches. Kodiak has a long standing, comprehensive, well-functioning management plan for salmon. I am a commercial fisherman who resides in Homer and depends on the Kodiak area commercial salmon fishery to support my family. My crewmembers also reside in Homer and depend on this fishery for their income. This proposal would drastically affect my ability to continue to make a living commercial fishing.

Sincerely,

Robert Fellows

Ron Kavanaugh
self
12/28/2019 12:59 AM AKST

RE: PROPOSAL 37 Create a king salmon management plan with paired restrictions in Kodiak and Cook Inlet commercial fisheries

These two management plans have nothing in common. Pairing them would have unknown unintended consequences that could impair management for local stocks.

Sam Haughey

12/27/2019 10:38 PM AKST

RE: PROPOSAL 37 Create a king salmon management plan with paired restrictions in Kodiak and Cook Inlet commercial fisheries

I oppose this proposal. It is very vague and leaves a wide margin for interpretation that does not necessarily benefit the chinook run. This is a traveling fish and to expect all fish swimming in one area to be solely from that area is not the way salmon work. Kodiak is so far from Cook Inlet that it does not seem right to try to regulate one third of the Kodiak season around the possibility that some chinooks are traveling that way.

RE: PROPOSAL 37 Create a king salmon management plan with paired restrictions in Kodiak and Cook Inlet commercial fisheries

December 24, 2019 Alaska Board of Fisheries Board Support Section P.O. Box 115526 Juneau, AK 99811-5526 Re: Opposition to Proposal 37 Dear Chairman Morisky and Board of Fisheries Members, I am Steve Roth, Kodiak salmon purse seine and Lower Cook Inlet salmon purse seine permit holder and thank you for the opportunity to comment on proposals for the Kodiak finfish meeting. My wife and I reside in Homer, but fish in Kodiak mainly. I own and operate the F/V Sea Grace. We rely solely on salmon seining for our livelihood and annual income to support our business, our family and contribute to our Alaskan economy through business and personal expenditures. I oppose proposal 37 because it works from an assumption that Kodiak does not have its own Chinook stocks and existing Chinook restrictions. It also ignores Cook Inlet and Kodiak sportfish harvests of Chinook salmon. This proposal asks to shut down a significant portion of Kodiak's historical commercial salmon fishery that has a successful and complex biology-based management plan in order to possibly save 250-270 fish versus the tens of thousands of fish from local sockeye, pink, coho and chum stocks. This proposal could have devastating impact on the sustainability of Kodiak stocks, statewide fishing businesses and the Kodiak communities in which the majority of these fish are landed and processed. I would also like to remind the Board and the author of this proposal that Kodiak's commercial salmon fishery already has a non-retention policy for Chinooks 28 inches or greater in length. I see no reason that could justify the Board making any changes to Kodiak's salmon management plans and ask that you reject proposal 37. Thank you for your careful consideration of this matter, Steven & Jenny Roth F/V Sea Grace Homer, AK

Tollef Monson

12/25/2019 06:41 PM AKST

RE: PROPOSAL 37 Create a king salmon management plan with paired restrictions in Kodiak and Cook Inlet commercial fisheries

The KMA is the most complex area to manage and this proposal if allowed would greatly hamper ADFG's ability to manage and conserve our own systems. Kodiak is an island and tradition is what Alaska is built upon. if this were to be enacted then we would lose access to our own fish and many fisherman who are barely viable would not get the days we need to make a living. I am particularly vulnerable to given that I am a bush Alaska, one of those traditional types who choose to live year round off the grid and relying only on a blue water economy. I don't own a big boat or other permits to fish nor have another full time job in town or else where. Summer Kodiak salmon is what my bones are built on. Please don't spoil the carefully crafted ADFG management plan and the culture of traditional living in remote Alaska that is going extinct. Thank you

Tyler-Rose Hoffman
PO Box 1212
Kodiak, AK 99615

12/24/19

Chairman Reed Moriskey
Alaska Board of Fisheries
Board Support Section
P.O. Box 115526
Juneau, AK 99811-5526

RE: Oppose Proposal 37

Dear Chairman Morisky and Board of Fish members:

I live in Kodiak and my husband and I operate a commercial fishing business. We rely on salmon for the bulk of our income, though we also participate in halibut, sea cucumber, and cod fisheries. Our ability to stay in Kodiak depends on the health of the Kodiak salmon fishery. I respectfully request the Board reject Proposal 37.

I oppose this proposal because it would shut down a significant portion of Kodiak's fishery to protect a specific salmon species. Kodiak already has a management plan in place to protect king salmon. The few king salmon saved would have no measurable conservation affect, but a huge impact on our livelihood. The few additional kings that might be saved aren't worth endangering the rest of the salmon fishery.

The Kodiak Salmon Management plan is good as it is and I see no need for any changes to it. Thank you for the opportunity to comment on the proposals before the meeting. As always, I look forward to visitors getting to enjoy our great town and vibrant fishing community.

I humbly request the Board reject Proposal 37.

Sincerely,

Tyler-Rose Hoffman
F/V Relentless

Donald Lawhead

12/26/2019 11:25 PM AKST

RE: Proposed amended language for proposal 37 (submitted at the Lower Cook Inlet meeting as RC9 by request of Board Member Wood)

Creating a new management plan will further burden the ADFG. The budget cuts have made it difficult to mange the plans we have now.

Jamin Hall

12/27/2019 10:56 PM AKST

RE: Proposed amended language for proposal 37 (submitted at the Lower Cook Inlet meeting as RC9 by request of Board Member Wood)

My name is Jamin Hall, my wife and I have a set net site in Uganik Bay. I am writing in opposition to proposal 37, including with the amended language. It seems to be an outlandish proposal with no basis in fact. The only information I know of is from gulf trawl fisheries bycatch studies which indicate over 90% of the kings in the gulf are from British Columbia and the US west coast. If this is correct, then fisheries in both Kodiak and Cook Inlet would suffer and the local kings would not be helped more than fractionally

Mariel Ellingson

12/27/2019 10:32 PM AKST

RE: Proposed amended language for proposal 37 (submitted at the Lower Cook Inlet meeting as RC9 by request of Board Member Wood)

My name is Mariel Ellingson, I'm 30 years old and I grew up set netting In kodiak. I live in kodiak and was fortunate to participate in this years salmon seine season. These are not conservation proposal.

Alaska Board of Fisheries
Board Support Section
P.O. Box 115526
Juneau, AK 99811-5526

Re: Opposition to RC 09 as substitute language for Proposal 37

Dear Chairman Morisky and Board of Fisheries members,

I Live in Homer, AK and support our family by operating our own boat in the Kodiak salmon seine fishery. I oppose both the board recommended alternate language to proposal 37 (RC9 from the LCI board meeting) and the very poor public process that enabled this late proposal to be accepted.

At the Lower Cook Inlet (LCI) meeting in Seward, testifying in opposition to proposal 37 (a chinook salmon "paired restrictions" proposal affecting Lower Cook Inlet, Kodiak, and Upper Cook Inlet), United Cook Inlet Drifters Association (UCIDA) attacked Kodiak again by submitting a proposed amendment (RC 09) that highjacked proposal 37 entirely so that only Kodiak fisheries would be adversely affected, and broadening chinook salmon to all salmon. If I was not in attendance at the LCI board meeting I would not of even know that the board accepted the RC 09 language to be included with proposal 37. RC 09 has not been added to the list of proposals seeking public comment on the Kodiak board meeting page and is only found on the "submit comment" page making it very difficult for the general public to even know that RC 09 is open for public comment.

Since the original proposal 37 would not be taken up until the Upper Cook Inlet meeting in February, the board did not deliberate proposal 37. Nor did they take up UCIDA's "amendment" in RC 09 that makes proposal 37 an odious Kodiak salmon management plan that bears

no relationship to and shares no language with proposal 37. RC 09 is a new proposal circumventing the regular process.

Then in the last hour of the Lower Cook Inlet meeting, a board member asked the Executive Director to put UCIDA's proposed amendment (RC 09) out for public comment, despite knowing it was less than 30 days before the Kodiak meeting, and many months past the proposal deadline for the Kodiak meeting.

This irregular action raises some serious questions:

1 Did the action to seek public comment on a public comment make the suggested amendment a board generated proposal?
2 The language bears no resemblance with original proposal 37. If RC 09 is intended to be a real amendment to proposal 37, what happens to the original proposal 37?
3 Since it only affects Kodiak, will the amendment still be deliberated in Upper Cook Inlet rather than in Kodiak? If so, why?
4 Why were no other RC's put out for public comment, only one highly allocative comment

involving Kodiak? Has this ever been done in the past? Will the board now start allowing late proposals into the process if they are identified as "amendments"?

5 Why is a board member pushing a highly allocative proposal that is identified as an amendment to a proposal that it commandeers?

6 Why wasn't the proposed amendment submitted as a regular proposal months ago?

7 How will the public and staff have sufficient time to learn about and absorb the objectionable impacts of the proposed plan on Kodiak's fishery?

8 Why isn't there a justification with the proposed action as is required on all other proposals that are timely submitted?

9 The suggested management plan in RC 09 never states a problem that needs addressing. Why would a board member think considering this matter is good public policy?

10 If it is good public policy, why the last-minute subterfuge in putting the amendment into the record out of area on a proposal that would be deliberated out of area?

The board now owns the irregular amendment. The board's best option is to not give RC 09 the light of day. It is a huge divergence from the normal public process. It doesn't state a problem, contains no justification, is several months late, and makes the board look biased before a meeting. Any action to move RC 09 taints the process, taints the board, and sets a dangerous precedent.

I respectively ask that the board does not support poor public process by creating a board generated proposal and rejects adopting RC 09 as amended language for proposal 37.

Sincerely,

Matthew Alward

Oliver Holm
self
12/27/2019 09:59 PM AKST

RE: Proposed amended language for proposal 37 (submitted at the Lower Cook Inlet meeting as RC9 by request of Board Member Wood)

The commercialized sport fishery has been allowed to expand to unsustainable levels. Millions of hatchery kings are released to the Gulf of Alaska to compete directly with wild kings and now we see a proposal to interfere with the Kodiak food fishery which produces millions of pounds of food. It is known that only a very small proportion of kings caught around Kodiak are of Cook Inlet origin. While this proposal could create many problems for Kodiak's fishery it would have very little positive impact on kings returning to Cook Inlet.

Adam Barker
Kashvik Fisheries LLC F/V Allie B
12/27/2019 01:51 AM AKST

RE: PROPOSAL 66 Create a Kodiak Area Salmon Management Plan

Adam Barker 41584 Manson drive Homer AK 99603 12/26/19 Chairman Reed Moriskey Alaska Board of Fisheries Board Support Section PO Box 115526 Juneau, AK 99811-5526 RE: Proposal 66 Dear Chairman Morisky and Board of Fish Members: My name is Adam Barker, Im 42 years old and have been fishing in Kodiak since 1988, while my home residance has been Homer since 1981. I grew up on the back deck of my dads boat in Kodiak until I graduated high school in 1995 and whent to Chignik to make the big money. I bought my own Kodiak seine opperation in 1995 (only area i could afford) where i continue to fish today raising my two kids on the back deck. I strongly advise the board to reject proposal 66. this proposal is a slap in the face to fish and game, saying they are not doing a good job and need to re write the management plan. This proposal is a prime example of UCIDA trying to shut us down because of all the restrictions they have been facing with allocation issues with different user groups in Cook Inlet. I was told by a UCIDA member "We have been suffering from the sport fisherman taking more from us, so its time for us to take from you." Meanwhile they over escape the Kenai river with sockeye every year theirs a decent run. I strongly advise the Board to reject this extreme proposal written by a group of extremest. The Kodiak Management Plan has been in affect for over 40 years and is proven to work as Kodiak stocks thrive. please do not make changes because the Cook Inlet Driffters are blaming Kodiak seiners for their miss managed fishery. Thank you for giving me the opportunity to comment . I hope the Board continues to apply consistency in its application of the guiding policies such as the mixed stock fisheries policy, and the sustainable fisheries policy. Sincerely, Adam Barker

Adelia Myrick

12/26/2019 10:33 AM AKST

RE: PROPOSAL 66 Create a Kodiak Area Salmon Management Plan

Dear Board of Fish members: I am writing in opposition to proposal 66 for many reasons. As a 2nd generation setnetter, I have grave concerns about this complex and arbitrary proposal. The basis of this proposal is UCIDA's reference to a genetic stock study of Kodiak area sockeye in the years 2014-2016. However, I wish to emphasize that this study is not new information. Over the past 30 years the management plan for Kodiak and all its complex systems and users and species run timing have been developed with appropriate adjustments made to take into account the fact that our location places us in the path of other salmon from time to time. The point is that these plans have been made carefully and with a lot of input. To base an entire re-writing of the management plan on one study which itself states that it is not to be used as a management tool would be the epitome of bad science. If the proposal were put into affect it would create economic problems not just for seiners but for all of us who fish in Kodiak and are impacted by more crowded fishing areas. If we are indeed shut down, and the proposal states that inner bays can be fished to prevent over-escapement, I emphasize that that completely shuts out the setnetters because we are not allowed in the inner bays. We have a limited area in which we can fish. I urge you as a board to take into account how incredibly complex the Kodiak management system is and the many many years of crafting that have gone into our management plans. The study presents no new information and so it is clear that there it would be a knee-jerk reaction to make any changes. Thank you for your consideration, Adelia Myrick Uganik Bay Setnetter

December 24, 2019

Alaska Board of Fisheries
Board Support Section
P.O. Box 115526
Juneau, AK 99811-5526

Re: Opposition to Proposal 66

Dear Chairman Morisky and Board of Fisheries Members,

I am Alex Roth, Kodiak and Lower Cook Inlet salmon purse seine permit holder. Thank you for the opportunity to comment on proposals for the Kodiak finfish meeting. My wife and I reside in Homer, but fish in Kodiak. I own and operate the F/V Wandering Star. We rely solely on salmon seining for our livelihood and annual income to support our business, our family and contribute to our Alaskan economy through business and personal expenditures.

The author of this proposal is citing a genetic study showing nothing new, simply a confirmation of something already known – that Cook Inlet origin sockeye sometimes swim through Kodiak waters. There are measures already in place (such as the North Shelikof Management Plan) that address this, to ensure that the vast majority of Cook Inlet- bound sockeye that do swim the Shelikof, make it through. Placing a cape to cape line on the mainland would keep Kodiak-area managers from maintaining the stability of local pink, silver, and chum salmon and raise serious concerns and precedents about the underlying foundation of common property fisheries in the State of Alaska.

Instead of an attempt to restructure the fisheries in a neighboring region, the Board's time would be better spent investigating the number of years the Kenai and Kasilof rivers have exceeded their escapement, and yet Cook Inlet drift-gillnetters and set-gillnetters still have minimal fishing time when in other regions there would be emergency openings to maintain the health of fish stocks and the rivers. For example, 2019 was a banner year, and yet commercial fishermen were forced to sit on their hands while the Kenai and Kasilof rivers were over-escaped by the hundreds of thousands.

The Kodiak Management Plan is a solid plan that has a proven working track record. The author appears to have little care for the success and sustainability of the management plan in our region and how it allows for the harvesting of local sockeye, pinks, silvers and chums.

I wish all the best to the user-groups of the Cook Inlet Region and hope that in the near future the user groups and management will be able to work together for more peaceful fisheries and sustainable and strong runs in that region.

I strongly encourage the Board to reject proposal #66.

Thank you for your careful consideration,

Alex and Jaime Roth
F/V Wandering Star
Homer, AK

Anitra Winkler

12/26/2019 11:01 AM AKST

RE: PROPOSAL 66 Create a Kodiak Area Salmon Management Plan

Hello Board of Fish Members, I am writing in regards to proposal 66 but really all the anti-Kodiak proposals. I grew up in remote interior Alaska, my parents were trappers. When I got to be highschool aged we moved to the small town of Cantwell and I went to the school and got into dog mushing, competing in Jr. Iditarod four times. Immediately after graduating from highschool I got a job as a setnet crew in Kodiak. I didn't know anything about fishing or the water but I loved the environment and had a great time. Fast forwarding I kept fishing in the summer all through college (I went to UAS in Juneau) and after graduating I bought a setnet site myself. I am now 26 and have had my site for three years and while not without its challenges I've enjoyed it. Setnetting is not a high volume fishery to begin with, so far I've been able to make enough from it to make my payments and cover my expenses and then I fish halibut as a crewmember and work various other jobs in the winter to make ends meet. If these proposals were to go through, either affecting me by limiting my fishing time or by increasing seine fleet pressure, the fishery would become unviable particularly for a young person. It is already difficult to make things work on the even years it would take very little to upset the applecart so to speak. I won't write a long thing as I think and hope that there are lots of letters to read, so don't assume length has a correlation to commitment. I feel it would be wrong to ruin one fishery to marginally help another one, as well as a terrible precedent. Thank you for your time, Anitra Winkler

RE: PROPOSAL 66 Create a Kodiak Area Salmon Management Plan

Bo Calhoun 57177 Zulu Ct. Homer, AK 99603 12/26/19 RE: Opposition to Proposal #66 Dear Chairman Morisky and Board of Fish members: I'm a third generation Kodiak salmon seiner. I was born in Homer, raised in Port Lions and Homer, and continue to live in Homer. My wife and I hope to raise our two sons on our family seine boat in a healthy Kodiak salmon fishery. I respectfully request you reject Proposal #66. The current Kodiak Management Plan has evolved over decades and is working as intended to promote responsible harvest of local stocks, while also limiting harvest of Cook Inlet sockeye (North Shelikof Straight Management Plan) and Chignik sockeye (Cape Igvak Management Plan). This proposal would create significant difficulty in management, regulation, and enforcement of the Kodiak fishery. Please reject proposal #66. Thank you for taking the time to read public comments. Sincerely, Bo Calhoun

Brad and Kay Underwood

12/24/2019 10:09 AM AKST

RE: PROPOSAL 66 Create a Kodiak Area Salmon Management Plan

Vote no on Proposal 66 The foundation of this proposal rests on a 3 year-study to determine the genetic composition of the Kodiak salmon harvest. This could provide the department with additional insight as how to best manage commercial fishing periods to achieve optimal salmon escapement targets. The problem with this study lies with its duration. Salmon migration compositions can vary significantly on a year-by-year basis. For a study of this nature to be statistically significant, it would have to take place over a much longer timeline. The degree of fluctuation possible in this 3-year analysis is probably high. The short duration of this study renders it unusable for implementing management changes. It is common knowledge that Kodiak is a mixed stock fishery. To have any relevance as a salmon management tool, this study would need to take in a much longer timeframe of 20 years or more. To make allocative changes relying on data from such a short period of time is not scientifically sound. It would be irresponsible to base decisions on incomplete data. Kodiak has a long-established traditional salmon fishery and nothing in this proposal meets the allocation criteria as determined by the Board of Fish. The only sensible decision to be made at this time is to vote no on proposal 66. Brad and Kay Underwood

Brian Mcwethy
KSA
12/23/2019 09:38 AM AKST

RE: PROPOSAL 66 Create a Kodiak Area Salmon Management Plan

My name is Brian Mcwethy. I was born and raised in kodiak. I live in kodiak with my family and we all depend on my income. I fished with my father on his seiner growing up and now I own and operate a seiner. Salmon seining and tanner crab fishing in kodiak are currently our only sources of income. I plan to try and continue to fish the kodiak waters and possible my children will have the opportunity to. I hope the current and historical areas we fish aren't taken from us and the future generations of kodiak. I oppose proposal 66. This would take away an unprecedented amount of fishing area that kodiak fishermen have historically fished in. This would seriously affect the kodiak seiners and setnetters as it would consolidate more gear to setnet areas. All area k fishermen would be affected and not be able to fish historical areas.

Charles and Theresa Peterson
1850 Three Sisters Way
Kodiak, AK 99615

December 26, 2019

Chairman Reed Moriskey
Alaska Board of Fisheries
Board Support Section
P.O. Box 115526
Juneau, AK 99811-5526

RE**: Oppose Proposal 66**

Dear Chairman Morisky and Board of Fish members:

We moved to Kodiak in the 1980's to pursue the opportunity for a livelihood in commercial fishing. We found what we were looking for, a chance to make a living off the sea and stayed, raising three children and developing deep relationships in our island home. Kodiak is a community built on fish and the size of the fleet, the processing infrastructure, the support services and the overall health of our coastal community is dependent on sustainable fisheries. Salmon fishing is the mainstay of our commercial fishing business and without it we would not have the financial means to stay in Kodiak, maintain a vessel and prosecute other fisheries. We own a 42', shallow draft seine vessel that primarily operates in the Alitak district. Our son now runs the boat and Charles and I run a setnet site in Alitak Bay. We choose to diversify our salmon fishing with participation in both the seine and setnet fishery so our son can run the boat with his crew and the rest of the family can prosecute the fishery from a shore-based operation.

We are opposed to proposal 66 and in reading through the proposed caps there is little to no understanding of the salmon fishery around Kodiak Island. The current Kodiak salmon management Plan provides for the harvest of local stocks in addition to local pink and chum salmon. The harvest triggers are unrealistic and arbitrary. Kodiak based fishermen would reach the caps on local stocks alone and be prevented from harvesting pink and chum salmon. The thesis for the proposal references the genetic study and uses the limited study for the basis of a major management change for which the study was not intended. The limited genetic study was focused on sockeye yet the proposed closure time would severely curtail pink and chum harvests. The magnitude of the impacts to Kodiak area salmon fisheries is concerning to say the least: seiners would be forced into bays with hopes of avoiding over escapement, terminal fisheries would open to mitigate over escapement resulting in less quality, gear conflicts would between user groups, small seiners who tend to operate in the bays would be marginalized by an action to move larger seine vessels in, fishing patterns that have been in place for decades would change, the list goes on for unknown gains to a region 400 miles away.

The State of Alaska clearly benefits from local area management plans and area managers must have the ability to manage.

Sincerely,

Charles and Theresa Peterson

December 22, 2019

Alaska Board of Fisheries
Board Support Section
P.O. Box 115526
Juneau, AK 99811-5526

Re: Opposition to Proposal 66

Dear Chairman Morisky and Board of Fisheries Members,

My name is Chris Johnson and I am a second-generation fisherman in Kodiak, Alaska. I grew up fishing on my dad's boat and got my first crew job working for someone else two weeks after I graduated high school. I haven't missed a salmon season since. I bought into the fishing industry in 2011 with the purchase of a 25-foot jig boat that I worked for two years in the winter and spring months while I still crewed for salmon in the summer. Access to the jig fisheries focusing on cod and rockfish was the only way that I could afford to move into the salmon fleet with a 38-footer in 2013. After the recent cod collapse, I now primarily rely on salmon seining and live here year-round with my wife.

The proposed Kodiak Area Salmon Management Plan and harvest triggers are completely unrealistic. Kodiak fishermen would reach harvest caps incredibly quickly and this plan would decimate the Kodiak salmon fishery that is economically and culturally so valuable for our region and for the State of Alaska. UCIDA is grasping at a solution for a proposed problem that they are saying can be supported by the 2014-2016 genetic study. However, the genetic sockeye identification study undertaken in the Kodiak Management Area really does not provide "new" information. The study merely confirmed what was already known about the presence of Cook Inlet sockeye in the Kodiak area and demonstrated that amounts vary greatly from year to year. There is no basis for additional restrictions on Kodiak's salmon fishery because the presence of Cook Inlet sockeye in the Kodiak Management Area has already been accounted for in current management. Kodiak's North Shelikof Management Plan was created so that Kodiak fishermen would share the "conservation burden" with Cook Inlet by limiting fishing in that area.

Taking away any fishing opportunity from Kodiak fishermen, particularly from the small boat fleet, would have a direct negative impact on new entrants trying to gain a foothold in this industry, fishing families trying to get by, and fishing support businesses in our region. I'm proud to call Kodiak home and am working to protect our fishing way of life.

Sincerely,
Chris Johnson
F/V North Star

December 22, 2019

Alaska Board of Fisheries
Board Support Section
P.O. Box 115526
Juneau, AK 99811-5526

Re: Opposition to Proposal 66

Dear Chairman Morisky and Board of Fisheries Members,

My name is Danielle Ringer and I appreciate the opportunity to comment on proposals before the Board in writing and in person for the Kodiak finfish meeting. I live in Kodiak with my husband and we own and operate the 38-foot F/V North Star. We chiefly rely on salmon seining and cod and rockfish jigging to maintain our fishing way of life and ability to live on Kodiak Island. I grew up in Homer learning to harvest and process fish from my parents in Kachemak Bay and dipnetting on the Kenai River. I hold a Master's degree from the University of Alaska Fairbanks in Political Ecology of Fisheries and was one of the researchers on the *Graying of the Fleet in Alaska's Fisheries: Defining the Problem and Assessing Alternatives* study in the Kodiak region.

The proposed Kodiak Area Salmon Management Plan and harvest triggers are completely unrealistic. Kodiak fishermen would reach harvest caps incredibly quickly and I believe this plan would decimate the Kodiak salmon fishery that is economically and culturally so valuable for our region and for the State of Alaska. UCIDA is grasping at a solution for a proposed problem that they are saying can be supported by the 2014-2016 genetic study. However, the genetic sockeye identification study undertaken in the Kodiak Management Area really does not provide "new" information. The study merely confirmed what was already known about the presence of Cook Inlet sockeye in the Kodiak area and demonstrated that amounts vary greatly from year to year. There is no basis for additional restrictions on Kodiak's salmon fishery because the presence of Cook Inlet sockeye in the Kodiak Management Area has already been accounted for in current management. Kodiak's North Shelikof Managment Plan was created so that Kodiak fishermen would share the "conservation burden" with Cook Inlet by limiting fishing in that area.

I see no biological, scientific, historical, economic, nor sociocultural reasons that could justify the Board making any changes to the salmon management plans in the Kodiak Management Area, which would create ripple effects negatively impacting Kodiak fishermen, processing workers, and community businesses. Thank you for your consideration of my comments and I look forward Board of Fisheries members spending time in our fishing community during the Kodiak meeting.

I humbly request the Board to reject this proposal.

Respectfully,
Danielle Ringer, M.A.
F/V North Star

December 22, 2019
Darren Platt (FV Agnes Sabine)
10708 Birch Cir
Kodiak, AK 99615

Alaska Board of Fisheries
Board Support Section
PO Box 115526
Juneau, AK 99811-5526

RE: **Oppose Proposal 66**

The members of the Alaska Board of Fisheries,

I'm writing in **opposition to proposal 66**. This proposal would put countless fishermen out of business in the Kodiak area and impose severe economic harm to the region and industry.

I'm a resident of Kodiak and the owner/operator of a 42-foot commercial fishing vessel. I participate in the local salmon, tanner crab, and herring fisheries.

Thank you,
Darren Platt

Dave Kubiak
F/V Lara Lee
12/27/2019 10:37 PM AKST

RE: PROPOSAL 66 Create a Kodiak Area Salmon Management Plan

I have been participating in Kodiak salmon fisheries since 1965, when I fished for Ole Harder running a gill net at Cape Ugat on the westside of Kodiak when I was 16 years old. I bought my first SO1K salmon seine permit in 1987. Like all these anti-Kodiak proposals, this one is clutching at straws. It seems to me that now that Kodiak has had a couple of decent salmon seasons, the other areas, Cook Inlet and Chignik especially, who are having a rough go lately have decided Kodiak is to blame. I remain hopeful that the Board of Fish will do their duty to due diligence and recognize these proposals for what they are, a misguided attempt to put the blame on Kodiak salmon fishers for problems of cyclical run strength, ocean survival, and other natural phenomena. The policies currently in effect have been carefully crafted over many years to take into consideration the issues of mixed stocks and good management. We have plowed this ground so many times before, it is time to give it a rest. Thank you.

Dave Kubiak
F/V Lara Lee
12/21/2019 03:05 PM AKST

RE: PROPOSAL 66 Create a Kodiak Area Salmon Management Plan

Unrealistic. Triggers would be reached by the catching of local stocks which would constraining the catching of local stocks. Again we have a proposal of a Draconian solution for a non-existent problem.

Donald Lawhead

12/26/2019 11:29 PM AKST

RE: PROPOSAL 66 Create a Kodiak Area Salmon Management Plan

Creating a new mangement plan would further burden the ADFG. The current budget cuts have made it hard for the ADFG to mange the plans currently in place.

Fred Stager

F/V Lady Lu

December 12, 2019

Alaska Board of Fisheries Board Support Section

P.O. Box 115526 Juneau, AK 99811-5526

RE: Opposition to Proposal 66

Dear Chairman Morisky and Board of Fish Members:

This proposal is a joke and the Kodiak fleet (as usual) is the punchline. The harvest caps on local sockeye alone would trigger a shutdown off the fishery. It disregards the historic validity of our fishery and the Fish Boards Mixed Stock policy, fantastically recommending the Board eliminate the decades of work and compromise which involve the Kodiak Salmon Management Plan, and throw it all away so the fishery can be run for the benefit of the Cook Inlet Drift Fleet. **Please reject proposal 66.**
Thank You- Fred Stager

Garrett kavanaugh

12/27/2019 05:27 PM AKST

RE: PROPOSAL 66 Create a Kodiak Area Salmon Management Plan

Dear Chairman and Members of the Board, As a young fishermen who is working their way into the Kodiak Salmon fishery this proposal will cause Kodiak fishermen to lose a substantial amount of their catch. I have been investing into the Kodiak salmon fishery as much as possible, in 2019 I purchased a Kodiak salmon permit. I ran a seiner for the month of august. I plan on running the same boat for the entire 2020 salmon season in Kodiak.This proposal will make me reconfigure my entire plan. I am a cape fishermen and the boat i have acquired is a boat to fish the capes. It is not shallow and the net we have is built for the way we have historically fished in Kodiak. (on the capes This proposal would make my boat unrealistic to fish in Kodiak and the way i have grown up learning how to fish Kodiak obsolete . These proposals are re-allocations of Kodiak historical catch. Kodiak has always had intercept fisheries and we already have management plans in place that have been effective for the Kodiak salmon fishery. Please help ensure the future for young fishermen entering into the Kodiak Salmon fishery, and the people who have been investing and are established in the fishery. Thank you for considering these comments, Garrett Kavanaugh

Iver Holm

12/28/2019 12:33 AM AKST

RE: PROPOSAL 66 Create a Kodiak Area Salmon Management Plan

Dear Chairman Morisky and Board of Fish members: I am 31 years old and a life long resident of Kodiak. I grew up set netting in Uganik on the west side of the island with my mother until i was 14. I then started seining with my father until I was able to buy my own Kodiak seine operational the age of 27. Please oppose proposal 66. thank you for your time sincerely
Iver Holm

James Calhoun

12/26/2019 04:47 PM AKST

RE: PROPOSAL 66 Create a Kodiak Area Salmon Management Plan

I have been intimately involved in the Kodiak seine fishery since 1968 to present. Presently my son is fishing the Kodiak area and it is my desire to have my grandsons be able to participate in a healthy Kodiak fishery if they so desire. Throughout my career I have come to the conclusion that the ADF&G management for Kodiak has been stellar and has kept the stocks in Kodiak healthy overall with the current management plan. Proposal 66 shows a complete lack of understanding of the complexity of the Kodiak fishery. The present management plan has evolved over decades. The Cape Igvak plan protects Chignik's runs when they are weak. The North Shelikof management plans minimizes Cook Inlet stock catches. The management plan also provides opportunity to harvest local stocks which remain heathly because of the management plan. Roughly half of Kodiak seine permits are not used and are relatively cheap pointing out that it is not easy to make a living in Kodiak. Please oppose proposal 66 . thank you

Jamin Hall

12/27/2019 10:57 PM AKST

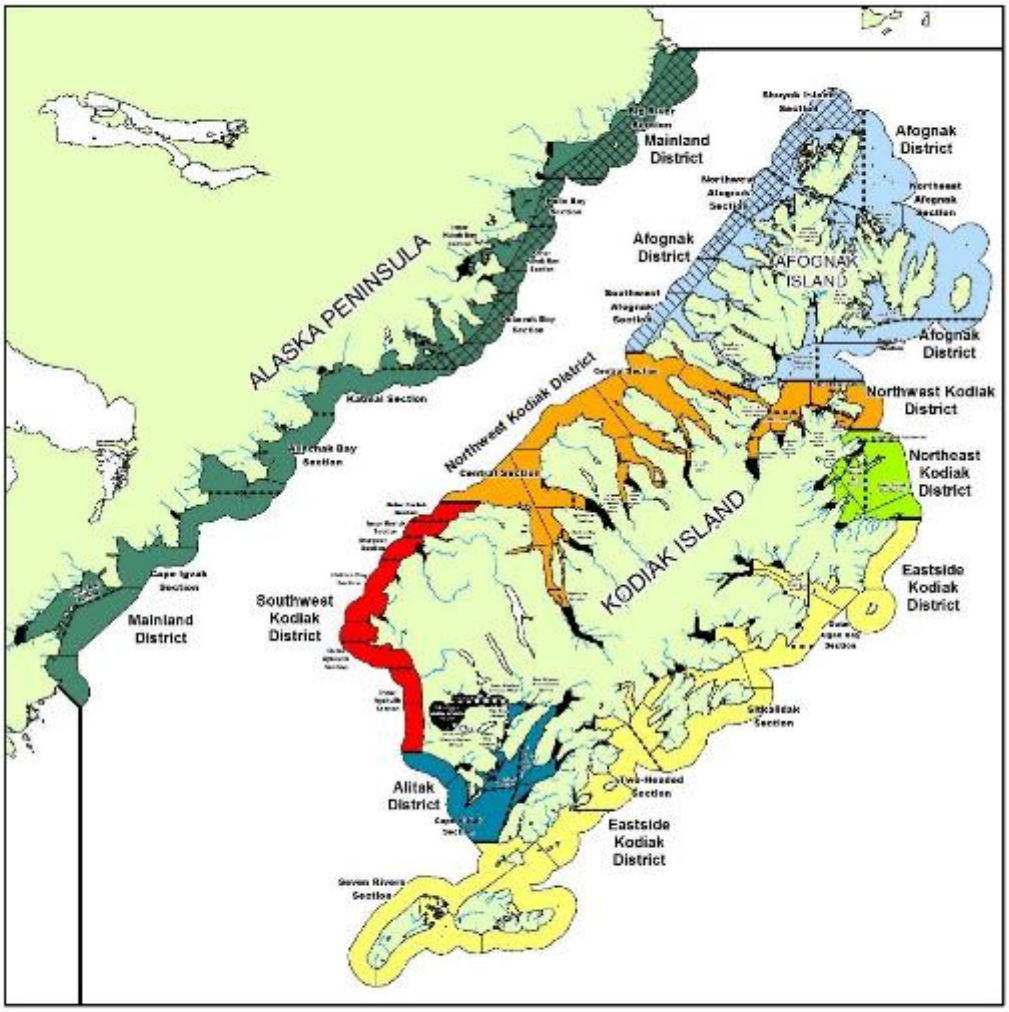
RE: PROPOSAL 66 Create a Kodiak Area Salmon Management Plan

My name is Jamin Hall, my wife and I have a set net site in Uganik Bay. I am writing in opposition to proposal 66. I believe this proposal is based upon a study which was very narrow in scope and not intended to be used as support for such a far-reaching proposal. This proposal if approved will have disastrous effects on the Kodiak salmon fishery in general, and may cause some fishermen, possibly myself and my family, to have to quit the fishery. I have fished for salmon in Kodiak since 2005, and have owned our setnet site on Kodiak's west side since 2014. My wife grew up setnetting in Uganik, and now we are raising our son and (soon a second child) as Kodiak fishermen. Fishing throughout the summer in Kodiak is integral to our way of life, and has financially sustained us.

ken Christiansen
F/V Mary Ann
12/26/2019 09:03 PM AKST

RE: PROPOSAL 66 Create a Kodiak Area Salmon Management Plan

Targeted interception of Cook Inlet bound sockeye ended in 1989 with creation of North Shelikof Sockeye Management plan Any change to a management plan should be based on scientific reason. Outcry from one user group to take from another is simply a knee-jerk reaction with a sense of immediate gratification but not necessarily improved results.



Economic Analysis Proposal 66

Kodiak Salmon Workgroup

Key Findings

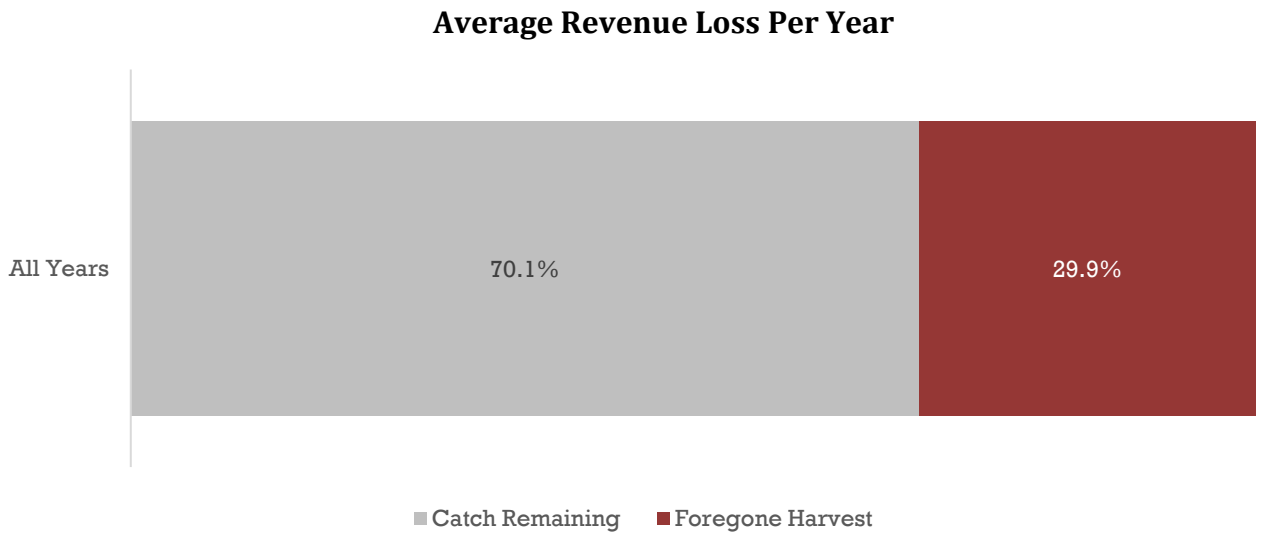
- Overall, proposed changes from Proposal 66 would result in an annual economic loss in the Kodiak Borough of more than $4.5 million dollars.
- On average, restrictions to the Westside would result in more than 50% of the current sockeye catch being eliminated.
- The complete implementation of proposal 66 (Cape Alitak, Westside, and Eastside area restricted fishing) would result in an average foregone harvest worth $3.12 million ex vessel price per year among affected fisherman.

$3.12 Million Dollars Yearly Direct Loss to Fishermen

- Loss per permit holder affected ranges from $23,600 to $76,100 per year (average $44,600, median $36,500), depending on number of affected fisherman and number of closure days in six-year study period (2014-2019).

$4.67 Million Dollars Annual Economic Loss in the Kodiak Borough

- Sockeye foregone harvest is estimated to be 1.5 million pounds per year worth an average of $1.83 million per year, using yearly prices.
- Species specific foregone harvest estimated to range between $9,500 (chinook) to $3.2 million (sockeye) per year.



Background

The 2019-2020 Board of Fish, Kodiak Finfish Proposal 66 will limit the number of harvestable sockeye salmon in the Kodiak-Area by creating a new Kodiak Area Management Umbrella Plan. Kodiak Finfish Proposal 66 seeks additional weekly and seasonal catch limits for the seine sockeye salmon fishery in the Eastside Kodiak, Alitak District, and Westside Kodiak districts during the last week of June and four weeks in July.

The proposed plan requires fishing to cease or be restricted to a specified region inside bays and headlands when the weekly harvest or catch limit is projected or achieved. When the catch limit is met, the department will restrict the fishery by emergency order to .5 nm inside a headland to headland line or terminal harvest area.

Weekly catch limits of salmon will apply to the total seasonal catch limits. When 85% or more of the seasonal harvest has been met, all fishing will be limited to inside bays or headland lines.

There are three impacted harvest areas defined by proposal 66: Alitak, Westside, and Eastside. These correspond to existing management areas Alitak District, Southwest and Northwest Kodiak Districts, and Eastside Kodiak District. Southwest Afognak District is occasionally included in "Westside Kodiak" harvest reporting but is excluded from this analysis as it is not included in proposal 66.

Link to Proposal:
https://www.adfg.alaska.gov/static/regulations/regprocess/fisheriesboard/pdfs/2019-2020/proposals/66.pdf

Data Sources

Foregone harvest days count and pound data was provided by the State of Alaska, Department of Fish and Game daily harvest reports. Price data for 2014-2018 was provided from the State of Alaska, Department of Fish and Game *Commercial Operator's Annual Reports* (COAR). 2019 price data was not available through the COAR report at the time of this analysis. 2019 price data is estimated from the five-year average of the reported 2014-2018 price per pound per species (see methods below). Multipliers for indirect and induced economic impact were commissioned from the US Department of Commerce, Bureau of Economic Analysis specifically for the Alaska commercial fishing industry. Inflation rates are provided from the US Department of Labor, Consumer Price Index. Tax information is from the State of Alaska, Department of Revenue and the Kodiak Borough.

Data Methods

Economic impact is estimated using historical harvest data, between 2014-2019. Proposed closures only impact the seine fishery; all data used for closure dates and foregone harvest reflects only seine gear.

Proposal 66 defines specific weeks that catch limits would be imposed for 2017-2019. For data analysis in prior years, applicable time period was developed based on language in the proposal and guidance from Kodiak Salmon Working Group members. Table 1 shows the full list of affected weeks considered:

Table 1: Proposal 66 Weekly Closures by Year

2019	
Week 1:	June 23 thru June 29
Week 2:	June 30 thru July 6
Week 3:	July 7 thru July 13
Week 4:	July 14 thru July 20
Week 5:	July 21 thru July 27

2018	
Week 1:	June 24 thru June 30
Week 2:	July 1 thru July 7
Week 3:	July 8 thru July 14
Week 4:	July 15 thru July 21
Week 5:	July 22 thru July 28

2017	
Week 1:	June 25 thru July 1
Week 2:	July 2 thru July 8
Week 3:	July 9 thru July 15
Week 4:	July 16 thru July 22
Week 5:	July 23 thru July 29

2016	
Week 1:	June 26 thru July 2
Week 2:	July 3 thru July 9
Week 3:	July 10 thru July 16
Week 4:	July 17 thru July 23
Week 5:	July 24 thru July 30

2015	
Week 1:	June 21 thru June 27
Week 2:	June 28 thru July 4
Week 3:	July 5 thru July 11
Week 4:	July 12 thru July 18
Week 5	July 19 thru July 25

2014	
Week 1:	June 22 thru June 28
Week 2:	June 29 thru July 5
Week 3:	July 6 thru July 12
Week 4:	July 13 thru July 19
Week 5:	July 20 thru July 26

Daily harvest counts were analyzed to determine closure dates in each affected area for year, 2014-2019, if proposal 66 limits had been in effect. Each affected area was then examined to determine the SOA Fish and Game statistical areas that would be affected by the closures .5nm inland from headland to headland. KSWG helped develop a list of stat areas and estimated percentage of foregone harvest in each particular stat area based on local expertise and experience. Percentage of foregone harvest for each stat area was applied to all species harvested during the closure period.

Table 2: Estimated Percent of Foregone Harvest by Stat Area

Management District	Stat Area	Section	Percent loss under Proposal 66
Alitak	25710	Cape Alitak	**100%**
	25720	Cape Alitak	**100%**
Southwest Kodiak	25520	Outer Karluk	**100%**

	25510	Inner Karluk	**100%**
	25640	Sturgeon	**100%**
	25630	Halibut Bay	**100%**
	25625	Halibut Bay	**100%**
	25620	Outer Ayakulik	**100%**
	25615	Inner Ayakulik	**100%**
	25610	Inner Ayakulik	**100%**
Northwest Kodiak	25939	North Cape	**100%**
	25938	North Cape	**100%**
	25933	Central	**100%**
	25311	Central	**80%**
	25331	Central	**75%**
	25314	Central	**75%**
	25410	Central	**75%**
	25440	Central	**60%**
Eastside Kodiak	25890	Seven Rivers	**100%**
	25885	Seven Rivers	**100%**
	25880	Seven Rivers	**100%**
	25870	Seven Rivers	**100%**
	25840	Sitkalidak	**100%**
	25810	Sitkalidak	**100%**
	25945	Outer Ugak Bay	**100%**
	25946	Outer Ugak Bay	**100%**
	25940	Outer Ugak Bay	**100%**
	25860	Two-Headed	**75%**
	25944	Outer Ugak Bay	**75%**
	25855	Two-Headed	**60%**
	25830	Sitkalidak	**60%**

Foregone harvest is calculated as percentage adjusted sum of all species harvested during the potential closure dates in the affected stat areas. Foregone harvest counts and economic impact are stratified by area (Cape Alitak, Westside, and Eastside) and year.

The number of permit holders affected by proposal 66 is calculated as the maximum number of unique permits during the closure period in daily harvest records. As active permit data is de-identified, it is impossible to deduplicate permit records over the course of the season. This method likely undercounts the number of permit holders affected over the season by a small amount: some permit holders affected by the closure dates throughout the season may not have been actively harvesting during the peak days of the season.

Species specific prices per pound for each year between 2014-2018 were obtained from the Fish Game COAR for each individual year. The total net weight in the Kodiak area for each species for each season is divided by the respective net value.

Final 2019 COAR price per species data is not available. Species specific price for 2019 was estimated as a five-year average of available COAR data (2014-2018). Verification of 2019 data with

the KSWG provided spreadsheets using Icicle, Ocean Beauty, and Pacific season prices for 2017-2019 compared to COAR for 2017, 2018. The spreadsheet values varied from published COAR by both higher and lower values up to 20%. The five-year average was much closer to 2017 and 2018 prices than the spreadsheet averages and weighted averages for respective years. The sockeye 2019 season price per pound estimate may be biased downwards given the processor spreadsheet; the COAR numbers were up to 20% lower than provided spreadsheet, and the five-year average is 16% lower than 2019 processor spreadsheet.

Indirect and induced economic loss was calculated from Regional Input-Output Modeling System (RIMS II) type I and type II multipliers. These take into account increase (in this case local loss) in regional economic activity due to change in industry specific earnings. For this report, the fisheries industry specific multipliers were used. Selected industry multipliers are specific to Alaska.

All values are adjusted for inflation and shown in 2019 dollar values.

All Areas Results & Data Tables

Direct Losses – All Areas

All years examined, 2014-2019, will be affected by Proposal 66 resulting in almost 30% of the current catch being restricted. Overall, these changes would result in an economic loss to the Borough of almost 4.7 million dollars a year.

$3.12 Million Dollars Yearly Direct Loss to Fishermen

$4.67 Million Dollars Annual Economic Loss in the Kodiak Borough

Direct revenue lost to the Kodiak Borough per year:

Direct loss per affected year:	**$3.12 Million**
Loss from sockeye fishery:	$1.83 Million
Fisheries employment impact:	27.5 jobs per year
All employment impact:	34.5 jobs per year
Indirect community loss:	$646,892
Induced community loss:	$911,444

Total Annual Borough Loss: $4,674,383

Proposal 66 would have impacts throughout the Kodiak Borough. The direct loss to fishermen would be $3.12 million per year. Of the total loss to the fishery, the limitation on the sockeye fishery comprise the majority of the impact, accounting for $1.83 million of the loss with $1.29 million of the total loss distributed among other salmon species.

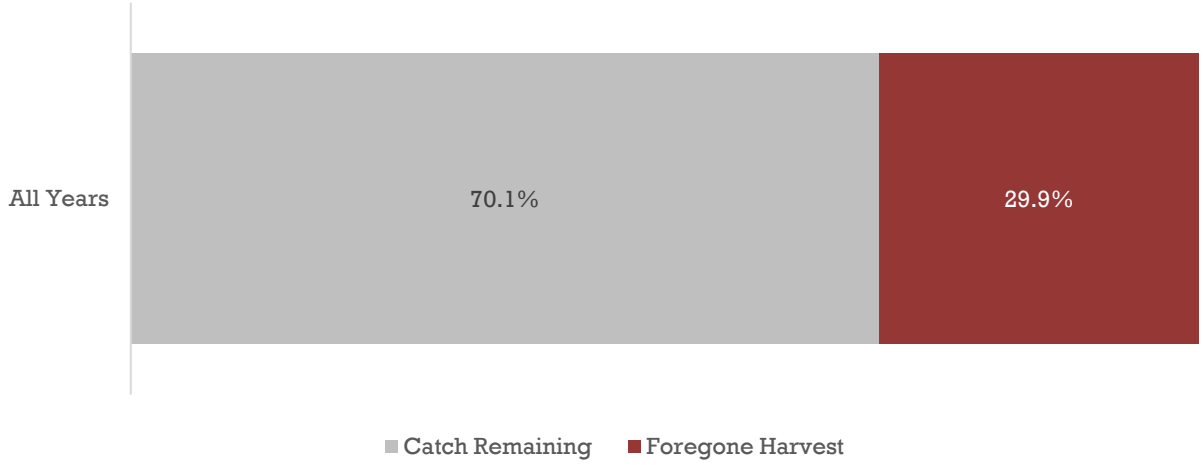
The direct impact of this proposal will result in a loss of 27.5 fisheries specific jobs and a total of 34.5 jobs overall in the Kodiak Borough per year. In addition to the direct loss impact of $3.12 million, there is a further indirect loss of $647k as a result of lost business to business economic activity for the community from purchases such as fuel, gear, and supplies. There is an additional

$911k of induced loss in the community resulting from the lost direct and indirect economic activity (total $3.76 million) and reduced labor market. This impact results in a total loss to the community from direct, indirect, and induced losses of $4.67 million dollars per year.

Fisheries Loss – All Areas

On average, restrictions of all areas during the effected years would result in almost 30% of the current catch being eliminated.

Chart 1: Average Revenue Loss Per Year



Over the last 6 years 2014-2019, there have been four years where the fisheries losses from these increased restrictions would result in a loss of more than $2 million of foregone ex vessel value to the fishery.

The sockeye fishery would experience ex vessel losses of more than $2 million for three of the affected years.

Chart 2: Total Fishery Loss 2014-2019

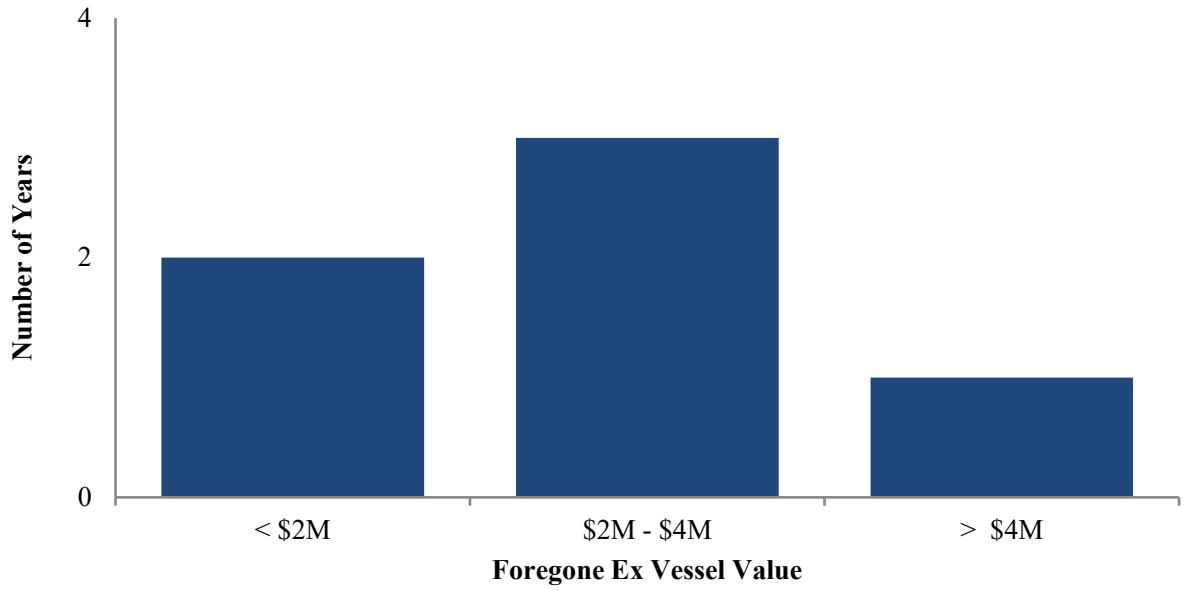
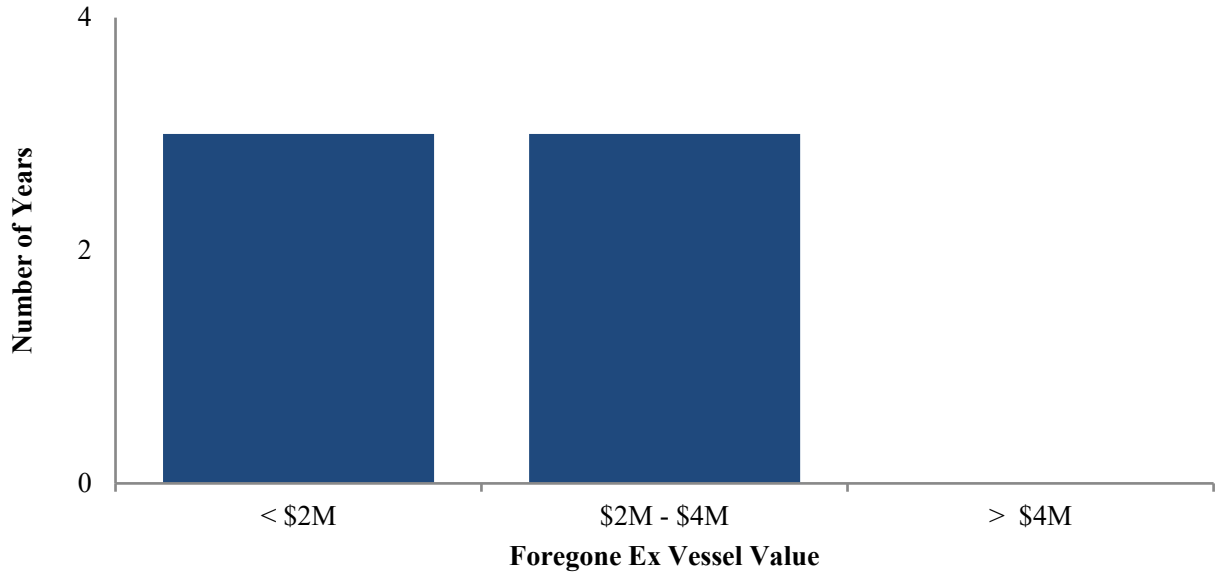


Chart 3: Total Sockeye Loss



The mean direct loss for all species per year is $3,116,048 with a median loss of $3,643,687. If these restrictions were in place the greatest impact would have been in 2019 with a loss of $4,571,609 and the least impact would have been in 2018 with a loss of $1,111,439.

Table 3: Direct Loss of Proposal 66 Implementation

Year	Direct Loss All Species	Direct Loss Sockeye
2014	$3,991,471	$3,263,981
2015	$3,805,036	$2,356,085
2016	$1,734,395	$1,379,175
2017	$3,482,337	$921,411
2018	$1,111,439	$845,043
2019	$4,571,609	$2,228,179
Mean	**$3,116,048**	**$1,832,312**
Median	**$3,643,687**	**$1,803,677**
Min	**$1,111,439**	**$845,043**
Max	**$4,571,609**	**$3,263,981**

Table 4: Direct Loss of Proposal 66 Implementation Per Fishermen

	Average Loss Per Fishermen – All Species	Average Loss Per Fishermen – Sockeye Only
Mean	**$44,620**	**$25,066**
Median	**$36,485**	**$23,721**
Min	**$23,648**	**$16,454**
Max	**$76,193**	**$37,136**

Based on the number of active permits per year, individual fishermen would experience a mean direct loss for all species per year of $44,620 with a median loss of $36,485. If these restrictions were in place the greatest impact would have been in 2019 with a loss of $76,193 per fishermen with the least impact in 2018 with an average loss of $23,648.

Table 5: Loss Per Affected Permit Holder

Year	Permits	Loss per Permit	Total Value Foregone Harvest	2019 Inflation Adjustment
2014	104	$38,380	$3,675,388	$3,991,471
2015	110	$34,591	$3,506,945	$3,805,036
2016	53	$32,724	$1,617,906	$1,734,395
2017	56	$62,185	$3,319,673	$3,482,337
2018	47	$23,648	$1,085,389	$1,111,439
2019	60	$76,193	$4,571,609	$4,571,609
Average		**$44,620**	**$3,555,382**	**$3,116,048**

Foregone Tax Revenue – All Areas

State Taxes	
Fisheries Business Tax (50% Share)	$49,857
SET Tax	$62,321
Total	**$112,178**
Borough	
Resource Severance Tax	$33,498
Fisheries Business Tax (Share of 50%)	$15,921
Total	**$49,419**

Cities (Share of Fisheries Business Tax)	
Akhiok	$3,715
Kodiak	**$14,837**
Larsen Bay	$3,713
Old Harbor	$3,986
Ouzinkie	$3,853
Port Lions	$3,831
Total	**$33,936**

The foregone harvest due to proposal 66 implementation would have tax implications for state, borough, and city budgets. The state implements two relevant taxes in the region: the fisheries business tax (which is shared with local governments) and the salmon enhancement tax (SET). Fisheries business tax rates vary by type of processing activity and the proportion of each is estimated from the State of Alaska's Annual Tax Report for FY18. The salmon enhancement tax rate is 2% in the Kodiak region. The Borough implements a resource severance tax of 1.075% and receives a share of the fisheries business tax from the state. The local city governments also receive a share of the fisheries business tax from the State of Alaska. Borough and city shares of the fisheries business tax estimated from the Borough's FY18 annual tax report.

The implementation of proposal 58 would result in average yearly tax losses of $112,178 to the State of Alaska, $49,419 to the Kodiak Borough, and $14,837 to Kodiak City.

Loss by Species – All Areas

Table 6: Sockeye Foregone Harvest

Year	Foregone Harvest - lbs	Sockeye Price	Foregone Harvest Value	2019 Inflation Adjustment
2014	1,642,696	$1.83	$3,005,507	$3,263,981
2015	2,339,730	$0.93	$2,171,507	$2,356,085
2016	1,008,726	$1.28	$1,286,544	$1,379,175
2017	580,650	$1.51	$878,371	$921,411
2018	457,932	$1.80	$825,238	$845,043
2019	1,516,187	$1.47	$2,228,179	$2,228,179
Total	**7,545,920**		**$10,395,346**	**$10,993,874**

Table 7: Chum Foregone Harvest

Year	Foregone Harvest - lbs	Chum Price	Foregone Harvest Value	2019 Inflation Adjustment
2014	309,123	$0.53	$163,580	$177,648
2015	559,333	$0.38	$213,325	$231,457
2016	137,215	$0.34	$46,261	$49,592
2017	2,291,226	$0.57	$1,314,315	$1,378,717
2018	215,205	$0.66	$142,487	$145,906
2019	253,158	$0.50	$125,740	$125,740
Total	**3,765,260**		**$2,005,707**	**$2,109,060**

Table 8: Pink Foregone Harvest

Year	Foregone Harvest - lbs	Pink Price	Foregone Harvest Value	2019 Inflation Adjustment
2014	1,283,874	$0.33	$425,484	$462,075
2015	4,083,889	$0.25	$1,003,482	$1,088,778
2016	441,843	$0.47	$208,554	$223,570
2017	2,399,904	$0.43	$1,027,773	$1,078,134
2018	191,367	$0.49	$93,714	$95,963
2019	5,477,262	$0.39	$2,154,860	$2,154,860
Total	**13,878,140**		**$4,913,867**	**$5,103,380**

Table 9: Coho Foregone Harvest

Year	Foregone Harvest - lbs	Coho Price	Foregone Harvest Value	2019 Inflation Adjustment
2014	104,630	$0.67	$70,432	$76,489
2015	269,498	$0.38	$103,625	$112,433
2016	92,663	$0.78	$72,568	$77,793
2017	111,963	$0.84	$93,598	$98,184
2018	20,018	$1.10	$22,074	$22,604
2019	69,152	$0.76	$52,271	$52,271
Total	**667,925**		**$414,568**	**$439,774**

Table 10: Chinook Foregone Harvest

Year	Foregone Harvest - lbs	Chinook Price	Foregone Harvest Value	2019 Inflation Adjustment
2014	10,800	$0.96	$10,385	$11,278
2015	22,038	$0.68	$15,007	$16,283
2016	4,392	$0.91	$3,979	$4,265
2017	7,334	$0.77	$5,616	$5,891
2018	2,429	$0.77	$1,877	$1,922
2019	12,918	$0.82	$10,559	$10,559
Total	**59,911**		**$47,424**	**$50,199**

Cape Alitak Results & Data Tables

Direct Losses – Cape Alitak

All years examined, 2014-2019, will be affected by Cape Alitak provisions in Proposal 66 resulting in more than 15% of the current catch being restricted. Overall, these changes would result in an economic loss to the Borough of $770 thousand per year.

$514 Thousand Dollars Yearly Direct Loss to Fishermen

$770 Thousand Dollars Annual Economic Loss in the Kodiak Borough

Direct revenue lost to the Kodiak Borough per year:

Direct loss per affected year:	**$514 Thousand**
Loss from sockeye fishery:	$347 Thousand
Fisheries employment impact:	4.5 jobs per year
All employment impact:	5.7 jobs per year
Indirect community loss:	$106,690
Induced community loss:	$150,322
Total Annual Borough Loss:	**$770,933**

The Cape Alitak provisions of Proposal 66 would have impacts throughout the Kodiak Borough. The direct loss to fishermen would be $514k per year. Of the total loss to the fishery, the limitation on the sockeye fishery comprise the majority of the impact, accounting for $347k of the loss with $167k of the total loss distributed among other salmon species.

The direct impact of this proposal will result in a loss of 4.5 fisheries specific jobs and a total of 5.7 jobs overall in the Kodiak Borough per year. In addition to the direct loss impact of $514k, there is a further indirect loss of $107k as a result of lost business to business economic activity for the community from purchases such as fuel, gear, and supplies. There is an additional $150k of induced loss in the community resulting from the lost direct and indirect economic activity (total $620k)

and reduced labor market. This impact results in a total loss to the community from direct, indirect, and induced losses of $770 thousand per year.

Foregone Tax Revenue – Cape Alitak

The foregone harvest due to proposal 66 Cape Alitak changes would have tax implications for state, borough, and city budgets. The state implements two relevant taxes in the region: the fisheries business tax (which is shared with local governments) and the salmon enhancement tax (SET). Fisheries business tax rates vary by type of processing activity and the proportion of each is estimated from the State of Alaska's Annual Tax Report for FY18. The salmon enhancement tax rate is 2% in the Kodiak region. The Borough implements a resource severance tax of 1.075% and receives a share of the fisheries business tax from the state. The local city governments also receive a share of the fisheries business tax from the State of Alaska. Borough and city shares of the fisheries business tax estimated from the Borough's FY18 annual tax report.

The implementation of the Cape Alitak section of proposal 66 would result in average yearly tax losses of $18,501 to the State of Alaska, $8,150 to the Kodiak Borough, and $2,447 to Kodiak City.

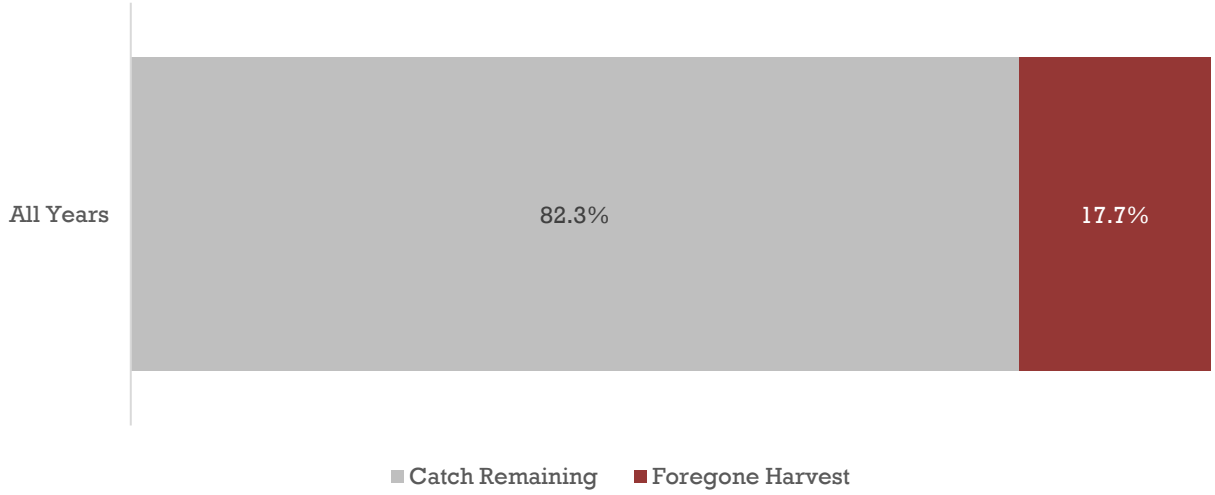
State Taxes	
Fisheries Business Tax (50% Share)	$8,223
SET Tax	$10,278
Total	**$18,501**
Borough	
Resource Severance Tax	$5,525
Fisheries Business Tax (Share of 50%)	$2,626
Total	**$8,150**

Cities (Share of Fisheries Business Tax)	
Akhiok	$613
Kodiak	**$2,447**
Larsen Bay	$612
Old Harbor	$657
Ouzinkie	$636
Port Lions	$632
Total	**$5,597**

Fisheries Loss – Cape Alitak

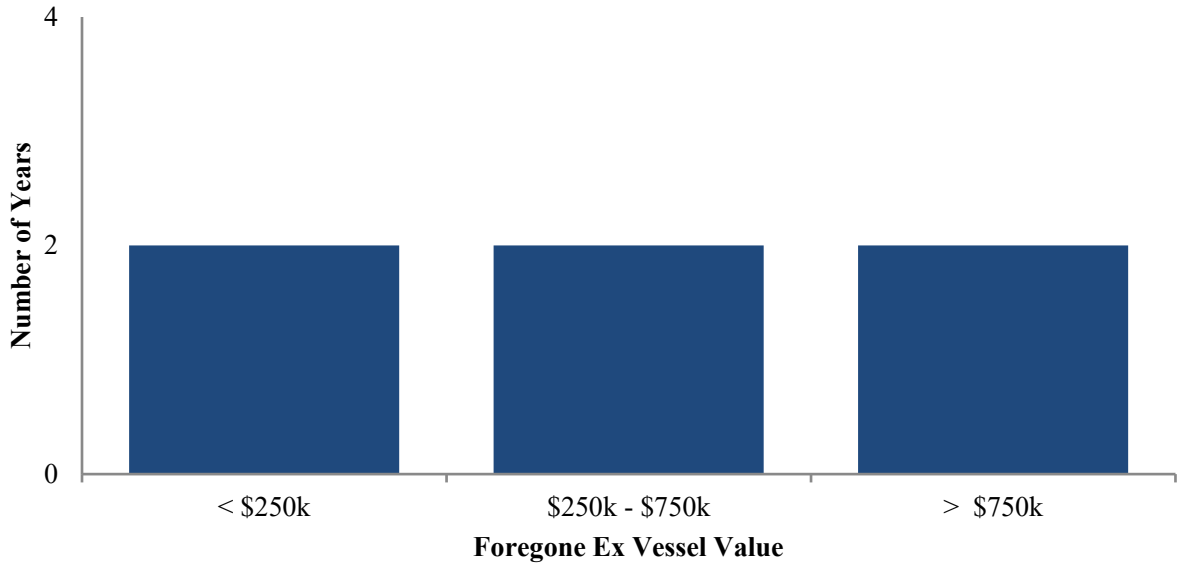
On average, restrictions of the Cape Alitak district during the effected years would result in more than 15% of the current catch being eliminated.

Chart 4: Alitak Average Revenue Loss Per Year



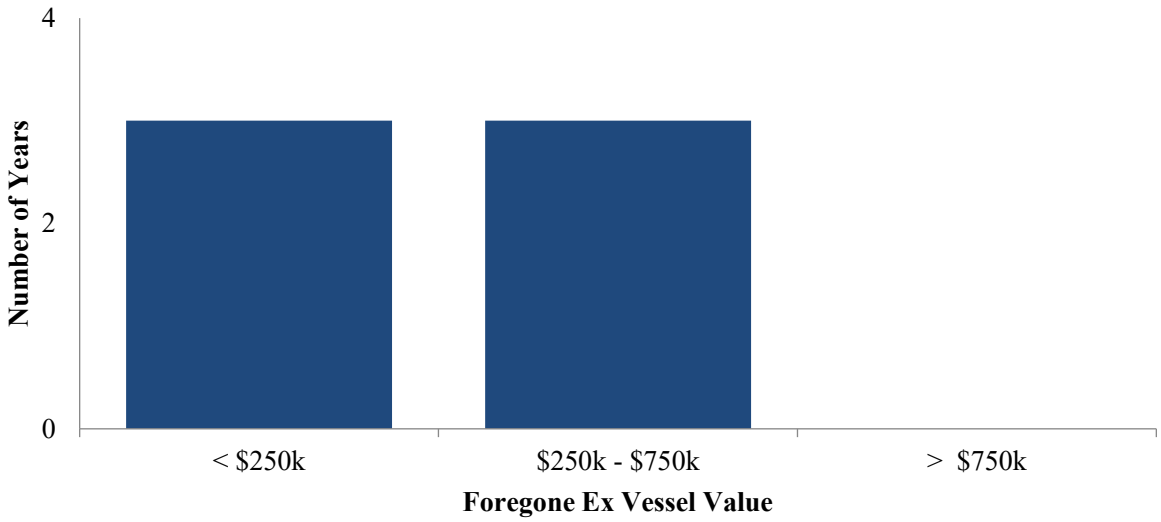
Over the last 6 years, 2014-2019, there have been four years where the fisheries losses from these increased restrictions would result in a loss of more than $250k of foregone ex vessel value to the fishery.

Chart 5: Cape Alitak Total Fishery Loss 2014-2019



The sockeye fishery would experience ex vessel losses of more than $250k for three of the affected years.

Chart 6: Cape Alitak Total Sockeye Loss



The mean direct loss for all species per year is $513,921 with a median loss of $537,986. If these restrictions were in place the greatest impact would have been in 2015 with a loss of $944,348 and the least impact would have been in 2017 with a loss of $70,310.

Table 11: Direct Loss of Proposal 66 Cape Alitak Implementation

Year	Direct Loss All Species	Direct Loss Sockeye
2014	$630,676	$533,683
2015	$944,348	$467,790
2016	$191,045	$171,290
2017	$70,310	$10,913
2018	$445,295	$343,377
2019	$801,852	$553,047
Mean	**$513,921**	**$346,683**
Median	**$537,986**	**$405,584**
Min	**$70,310**	**$10,913**
Max	**$944,348**	**$553,047**

Table 12: Direct Loss of Proposal 66 Cape Alitak Implementation Per Fishermen

	Average Loss Per Fishermen – All Species	Average Loss Per Fishermen – Sockeye Only
Mean	**$18,841**	**$11,912**
Median	**$16,904**	**$14,133**
Min	**$11,132**	**$2,183**
Max	**$30,463**	**$16,266**

Based on the number of active permits per year, individual fishermen would experience a mean direct loss for all species per year of $18,841 with a median loss of $16,904. If these restrictions

were in place the greatest impact would have been in 2015 with a loss of $30,463 per fishermen with the least impact in 2018 with an average loss of $11,132.

Table 13: Cape Alitak Closures

Year	Total Number of Days Fished	Total Days Regulated by Proposal 66	Number of Days Closed Under Proposal 66	Percentage of Regulated Days Closed Under Proposal 66
2014	31	11	9	82%
2015	59	16	13	81%
2016	27	11	7	64%
2017	56	8	2	25%
2018	44	14	11	79%
2019	60	16	15	94%
Total	**277**	**76**	**57**	**75%**

Eastside Results & Data Tables

Direct Losses – Eastside

All years examined, 2014-2019, will be affected by Eastside provisions Proposal 66 resulting in more than 15% of the current catch being restricted. Overall, these changes would result in an economic loss to the Borough of $880 thousand per year.

$587 Thousand Dollars Yearly Direct Loss to Fishermen

$880 Thousand Dollars Annual Economic Loss in the Kodiak Borough

Direct revenue lost to the Kodiak Borough per year:

Direct loss per affected year:	**$587 Thousand**
Loss from sockeye fishery:	$228 Thousand
Fisheries employment impact:	5.2 jobs per year
All employment impact:	6.5 jobs per year
Indirect community loss:	$121,880
Induced community loss:	$171,724
Total Annual Borough Loss:	**$880,697**

The Eastside provisions of Proposal 66 would have impacts throughout the Kodiak Borough. The direct loss to fishermen would be $587k per year. Of the total loss to the fishery, the limitations on non-sockeye species comprise the majority of the impact, accounting for $359k of the loss with $228k of the total loss being attributed to the sockeye salmon fishery.

The direct impact of this proposal will result in a loss of 5.2 fisheries specific jobs and a total of 6.5 jobs overall in the Kodiak Borough per year. In addition to the direct loss impact of $587k, there is a

further indirect loss of $122k as a result of lost business to business economic activity for the community from purchases such as fuel, gear, and supplies. There is an additional $171k of induced loss in the community resulting from the lost direct and indirect economic activity (total $709k) and reduced labor market. This impact results in a total loss to the community from direct, indirect, and induced losses of $880 thousand dollars per year.

Foregone Tax Revenue – Eastside

The foregone harvest due to proposal 66 Eastside changes would have tax implications for state, borough, and city budgets. The state implements two relevant taxes in the region: the fisheries business tax (which is shared with local governments) and the salmon enhancement tax (SET). Fisheries business tax rates vary by type of processing activity and the proportion of each is estimated from the State of Alaska's Annual Tax Report for FY18. The salmon enhancement tax rate is 2% in the Kodiak region. The Borough implements a resource severance tax of 1.075% and receives a share of the fisheries business tax from the state. The local city governments also receive a share of the fisheries business tax from the State of Alaska. Borough and city shares of the fisheries business tax estimated from the Borough's FY18 annual tax report.

The implementation of the Eastside section of proposal 66 would result in average yearly tax losses of $21,135 to the State of Alaska, $9,311 to the Kodiak Borough, and $2,796 to Kodiak City.

State Taxes	
Fisheries Business Tax (50% Share)	$9,393
SET Tax	$11,742
Total	**$21,135**

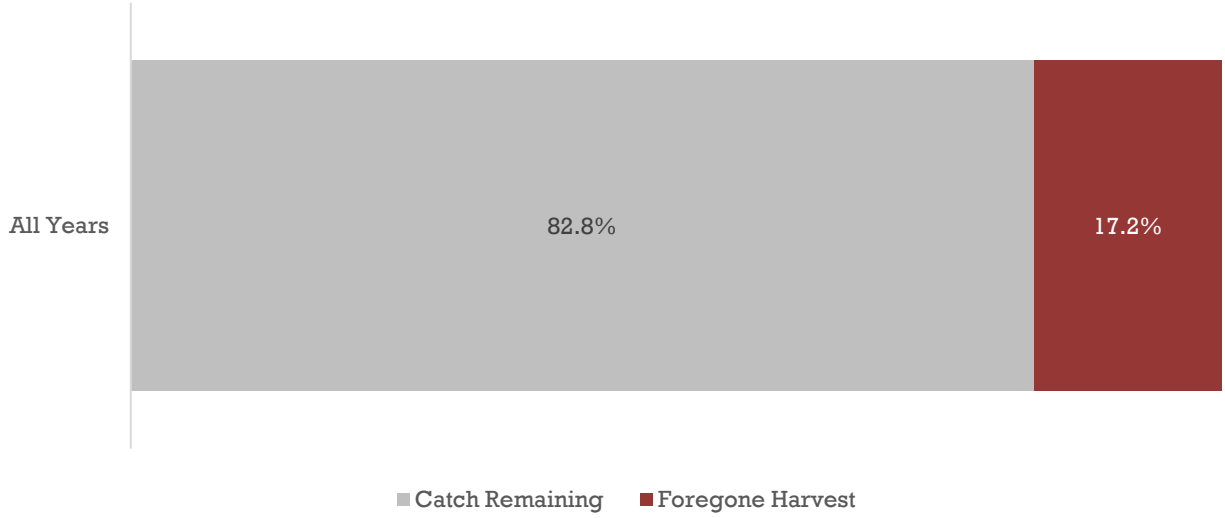
Borough	
Resource Severance Tax	$6,311
Fisheries Business Tax (Share of 50%)	$3,000
Total	**$9,311**

Cities (Share of Fisheries Business Tax)	
Akhiok	$700
Kodiak	**$2,796**
Larsen Bay	$700
Old Harbor	$751
Ouzinkie	$726
Port Lions	$722
Total	**$6,394**

Fisheries Loss – Eastside

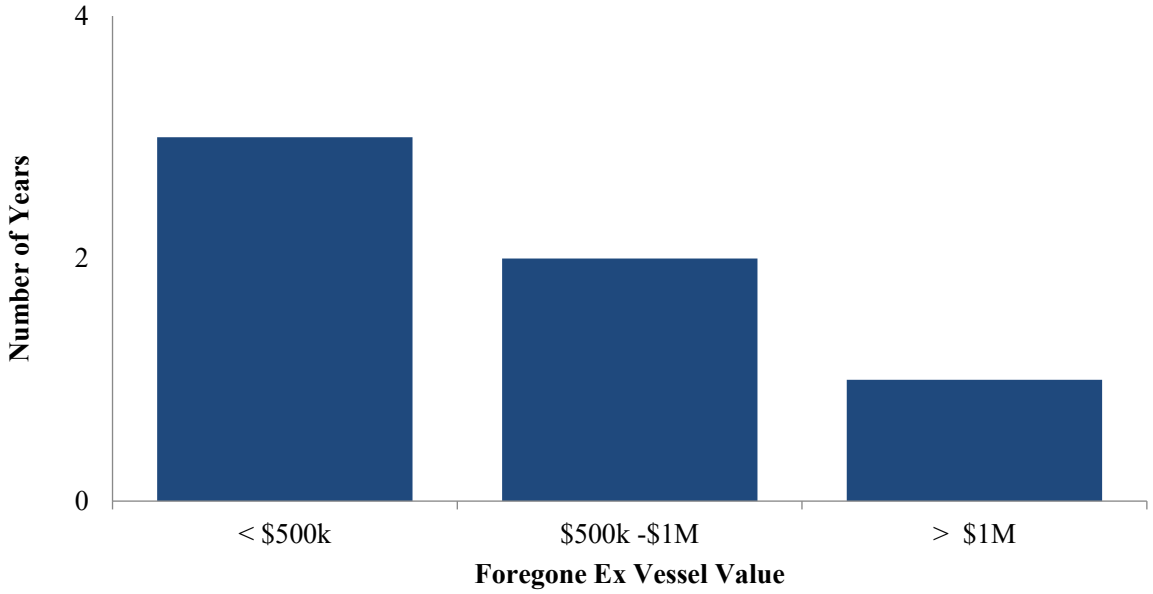
On average, restrictions of the Eastside district during the effected years would result in more than 15% of the current catch being eliminated.

Chart 7: Eastside Average Revenue Loss Per Year



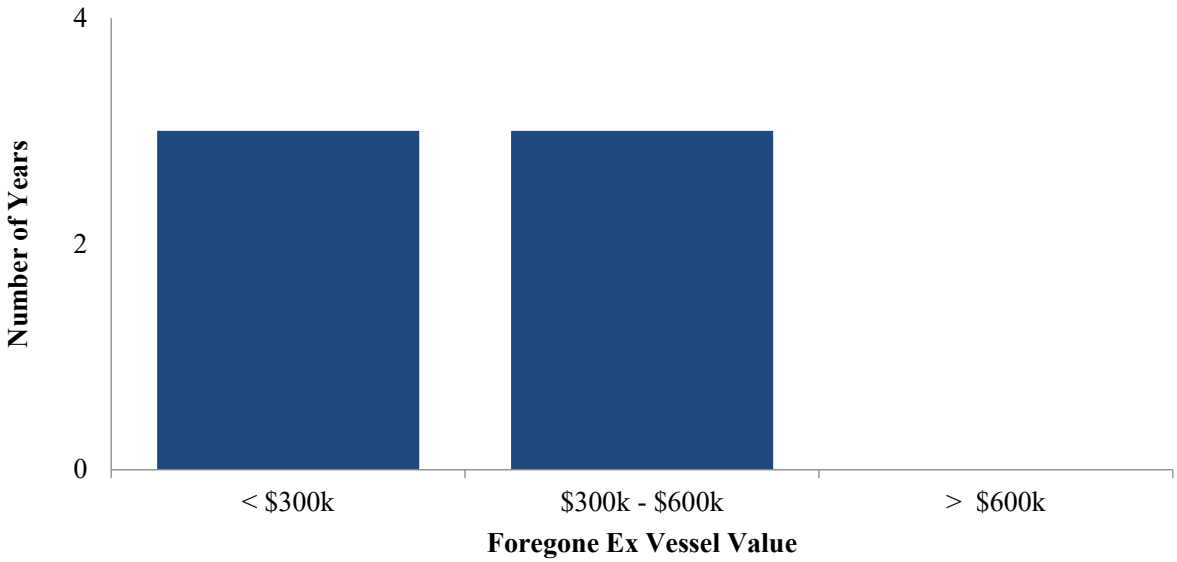
Over the last 6 years, 2014-2019, there have been three years where the fisheries losses from these increased restrictions would result in a loss of more than $500k of foregone ex vessel value to the fishery.

Chart 8: Eastside Total Fishery Loss 2014-2019



The sockeye fishery would experience ex vessel losses of more than $300k for three of the affected years.

Chart 9: Eastside Total Sockeye Loss



The mean direct loss for all species per year is $587,092 with a median loss of $484,679. If these restrictions were in place the greatest impact would have been in 2017 with a loss of $1,882,258 and the least impact would have been in 2018 with a loss of $9,653.

Table 14: Eastside Loss of Proposal 66 Implementation

Year	Direct Loss All Species	Direct Loss Sockeye
2014	$641,645	$364,260
2015	$19,638	$13,821
2016	$584,653	$472,207
2017	$1,882,258	$309,608
2018	$9,653	$2,118
2019	$384,705	$207,415
Mean	**$587,092**	**$228,238**
Median	**$484,679**	**$258,511**
Min	**$9,653**	**$2,118**
Max	**$1,882,258**	**$472,207**

Table 15: Eastside Loss of Proposal 66 Implementation Per Fishermen

	Average Loss Per Fishermen – All Species	Average Loss Per Fishermen – Sockeye Only
Mean	**$17,898**	**$8,056**
Median	**$17,067**	**$8,300**
Min	**$3,218**	**$706**
Max	**$37,645**	**$14,815**

Based on the number of active permits per year, individual fishermen would experience a mean direct loss for all species per year of $17,898 with a median loss of $17,067. If these restrictions were in place the greatest impact would have been in 2017 with a loss of $37,645 per fishermen with the least impact in 2018 with an average loss of $3,218.

Table 16: Eastside Closures

Year	Total Number of Days Fished	Total Days Regulated by Proposal 66	Number of Days Closed Under Proposal 66	Percentage of Regulated Days Closed Under Proposal 66
2014	34	21	15	71%
2015	55	15	2	13%
2016	33	23	16	70%
2017	57	18	16	89%
2018	24	9	1	11%
2019	16	12	8	67%
Total	**219**	**98**	**58**	**59%**

Westside Results & Data Tables

Direct Losses – Westside

All years examined, 2014-2019, will be affected by Proposal 66 resulting in more than 50% of the current catch being restricted. Overall, these changes would result in an economic loss to the Borough of $3.02 million per year.

$2.02 Million Dollars Yearly Direct Loss to Fishermen

$3.02 Million Dollars Annual Economic Loss in the Kodiak Borough

Direct revenue lost to the Kodiak Borough per year:

Direct loss per affected year:	**$2.02 Million**
Loss from sockeye fishery:	$1.26 Million
Fisheries employment impact:	17.8 jobs per year
All employment impact:	22.3 jobs per year
Indirect community loss:	$418,321
Induced community loss:	$589,398
Total Annual Borough Loss:	**$3,022,753**

The Westside provisions of Proposal 66 would have impacts throughout the Kodiak Borough. The direct loss to fishermen would be $2.02 million per year. Of the total loss to the fishery, the limitations on the sockeye fishery would comprise the majority of the impact, accounting for $1.26 million of the loss with $760k of the total being attributed to other salmon fisheries.

The direct impact of this proposal will result in a loss of 17.8 fisheries specific jobs and a total of 22.3 jobs overall in the Kodiak Borough per year. In addition to the direct loss impact of $2.02 million, there is a further indirect loss of $418k as a result of lost business to business economic activity for the community from purchases such as fuel, gear, and supplies. There is an additional $589k of induced loss in the community resulting from the lost direct and indirect economic activity (total $2.43 million) and reduced labor market. This impact results in a total loss to the community from direct, indirect, and induced losses of $3.02 million dollars per year.

Foregone Tax Revenue – Westside

The foregone harvest due to proposal 66 Westside changes would have tax implications for state, borough, and city budgets. The state implements two relevant taxes in the region: the fisheries business tax (which is shared with local governments) and the salmon enhancement tax (SET). Fisheries business tax rates vary by type of processing activity and the proportion of each is estimated from the State of Alaska's Annual Tax Report for FY18. The salmon enhancement tax rate is 2% in the Kodiak region. The Borough implements a resource severance tax of 1.075% and receives a share of the fisheries business tax from the state. The local city governments also receive a share of the fisheries business tax from the State of Alaska. Borough and city shares of the fisheries business tax estimated from the Borough's FY18 annual tax report.

The implementation of the Westside section of proposal 66 would result in average yearly tax losses of $72,541 to the State of Alaska, $31,957 to the Kodiak Borough, and $9,595 to Kodiak City.

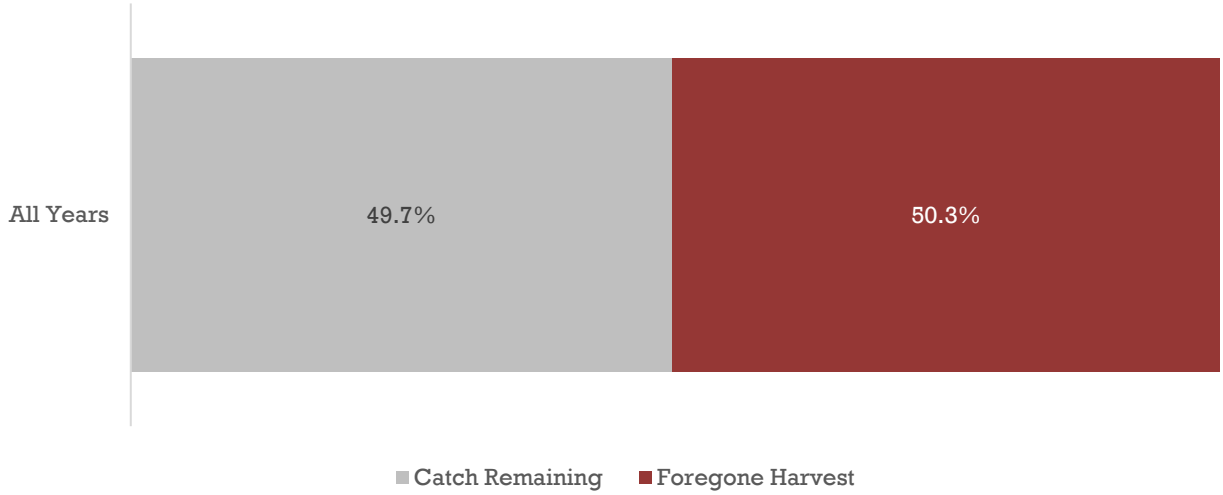
State Taxes	
Fisheries Business Tax (50% Share)	$32,241
SET Tax	$40,301
Total	**$72,541**
Borough	
Resource Severance Tax	$21,662
Fisheries Business Tax (Share of 50%)	$10,296
Total	**$31,957**

Cities	
(Share of Fisheries Business Tax)	
Akhiok	$2,402
Kodiak	**$9,595**
Larsen Bay	$2,401
Old Harbor	$2,578
Ouzinkie	$2,492
Port Lions	$2,477
Total	**$21,945**

Fisheries Loss – Westside

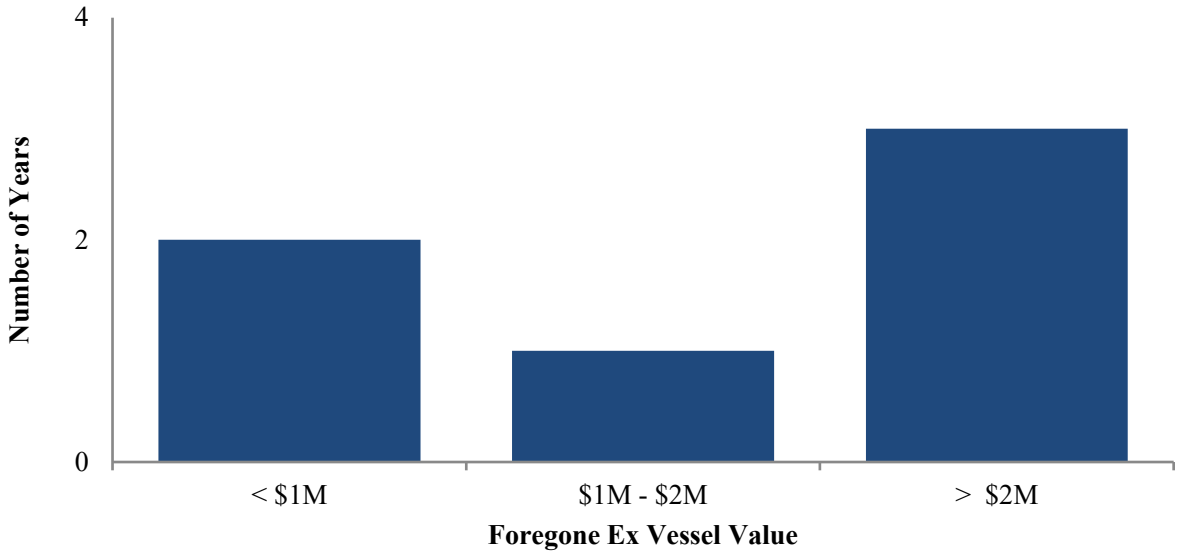
On average, restrictions of the Westside district during the effected years would result in more than 50% of the current catch being eliminated.

Chart 9: Eastside Average Revenue Loss Per Year



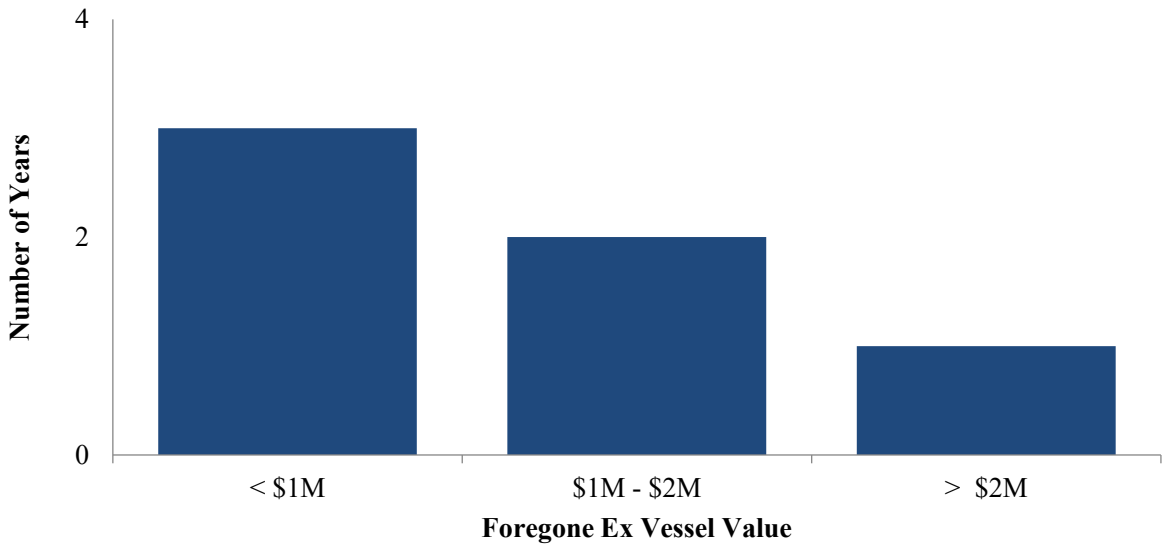
Over the last 6 years, 2014-2019, there have been four years where the fisheries losses from these increased restrictions would result in a loss of more than $1 million of foregone ex vessel value to the fishery.

Chart 10: Westside Total Fishery Loss 2014-2019



The sockeye fishery would experience ex vessel losses of more than $1 million for three of the affected years.

Chart 11: Westside Total Sockeye Loss



The mean direct loss for all species per year is $2,015,035 with a median loss of $2,124,459. If these restrictions were in place the greatest impact would have been in 2019 with a loss of $3,385,052 and the least impact would have been in 2018 with a loss of $656,491.

Table 17: Westside Loss of Proposal 66 Implementation

Year	Direct Loss All Species	Direct Loss Sockeye
2014	$2,719,150	$2,366,038
2015	$2,841,050	$1,874,474
2016	$958,696	$735,678
2017	$1,529,769	$600,891
2018	$656,491	$499,548
2019	$3,385,052	$1,467,717
Mean	**$2,015,035**	**$1,257,391**
Median	**$2,124,459**	**$1,101,698**
Min	**$656,491**	**$499,548**
Max	**$3,385,052**	**$2,366,038**

Table 18: Westside Loss of Proposal 66 Implementation Per Fishermen

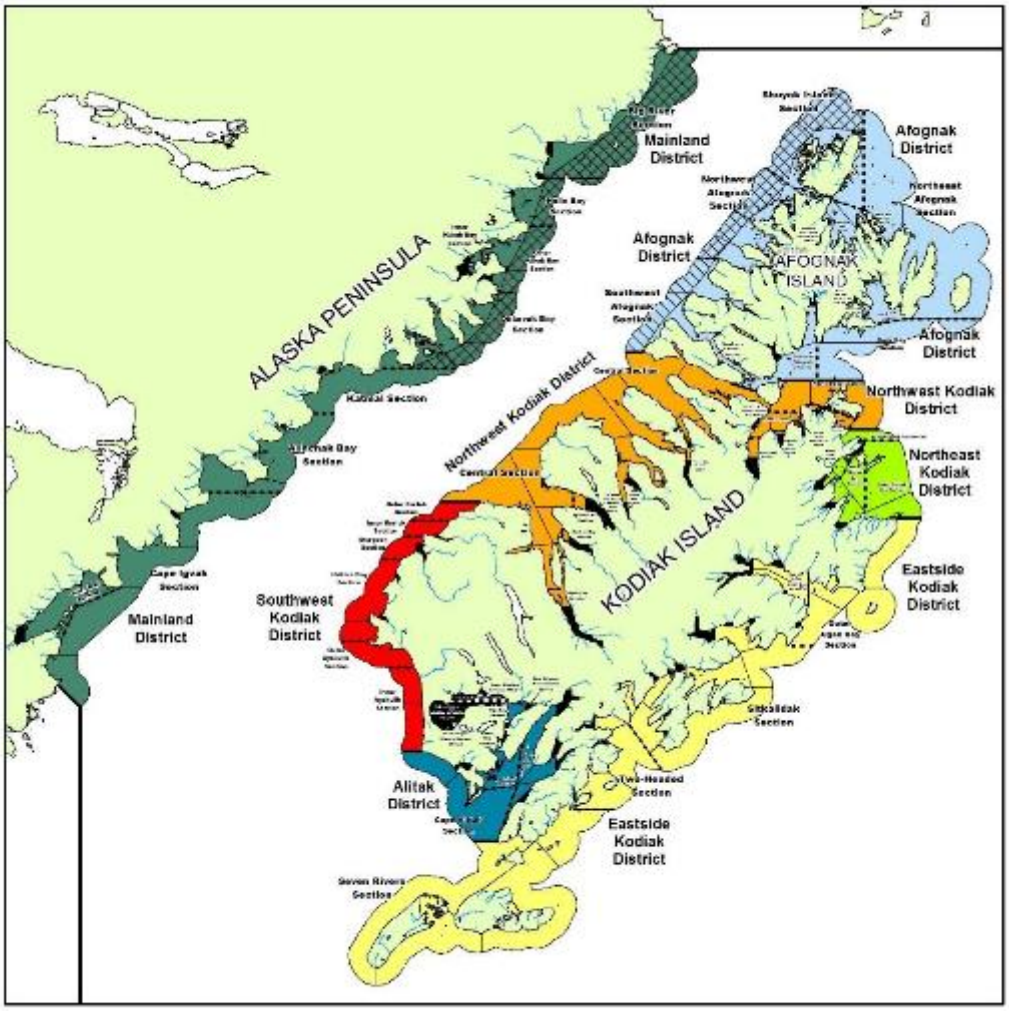
	Average Loss Per Fishermen – All Species	Average Loss Per Fishermen – Sockeye Only
Mean	**$27,961**	**$16,582**
Median	**$25,987**	**$15,461**
Min	**$13,968**	**$10,629**
Max	**$56,418**	**$24,462**

Based on the number of active permits per year, individual fishermen would experience a mean direct loss for all species per year of $27,961 with a median loss of $25,987. If these restrictions

were in place the greatest impact would have been in 2019 with a loss of $56,418 per fishermen with the least impact in 2018 with an average loss of $13,968.

Table 19: Westside Closures

Year	Total Number of Days Fished	Total Days Regulated by Proposal 66	Number of Days Closed Under Proposal 66	Percentage of Regulated Days Closed Under Proposal 66
2014	94	24	19	79%
2015	106	24	19	79%
2016	83	17	10	59%
2017	110	24	18	75%
2018	76	14	7	50%
2019	83	14	11	79%
Total	**552**	**117**	**84**	**72%**



Review of Genetic Studies of Sockeye Salmon Harvests in the Kodiak Management Area

Kodiak Salmon Working Group

Executive Summary

- Recent genetic analyses in Kodiak Management Area provide accurate and precise estimates of sockeye salmon stock proportions and harvest numbers in targeted Westside Kodiak fisheries, during monthly (June, July, August) time periods in 2014-2016. Very limited sampling occurred at Cape Igvak.

- The study was not designed to understand migratory patterns of sockeye salmon through KMA, nor to address finer temporal patterns of non-local stock distribution which might describe rapidly changing abundance of migrating stocks in specific areas. WASSIP results showed that proportions of one non-local reporting group varied by as much as eight fold in weekly samples of Shumagin Island and Dolgoi June fisheries harvests, 2007-2008.

- Harvests of Cook Inlet sockeye in KMA fisheries varied by an order of magnitude between study years and between monthly samples within a year. Incidental harvests in 2015 were particularly divergent, especially for July harvests, during an exceptionally large pink salmon run. The widely divergent harvest proportions of Cook Inlet fish in this three year study suggest no reliable patterns upon which to base specific management actions.

- Susitna bound fish overall represented the smallest component of Cook Inlet stocks incidentally harvested in KMA and accounted for less than 2.5% of total KMA sockeye harvest in 2014-2016 and less than 4.5% of

annual harvests in the sampled areas. Due to high estimated harvest rates of Susitna fish in Cook Inlet fisheries (average 38% 2006-2015) and large uncertainties in Susitna escapement estimates, it is unlikely that effects of any “savings” of these stocks in KMA fisheries could be measured with any confidence.

- In 2014-2016, estimated harvest of Susitna fish in Upper Cook Inlet fisheries was 3 fold to more than 40 fold greater than in KMA. Any conservation efforts for Susitna fish should be addressed in Cook Inlet fisheries.

- Data from Cape Igvak is limited to harvests in three temporal periods from two years. Incidental harvest of Cook Inlet fish varies by two orders of magnitude (50 fold) among those strata.

- Evidence suggests that management plans in KMA are working well, as all key sockeye stocks on the Westside are achieving their escapement goals and odd year pink salmon goals are consistently met.

Study Purpose and Design

The purpose of Shedd et al. (2016) was to use Genetic Stock Identification (GSI) methods to estimate temporal stock contribution to select Kodiak Management Area (KMA) sockeye fisheries during 2014-2016 by sampling major sockeye fisheries where significant harvest of salmon occurs (Foster and Dann, 2014, 2015). At its inception, the study intended to meet multiple information needs. Some local fishermen were

interested in a sampling program that could identify particular stocks in area fisheries, especially Alitak-bound fish harvested in Westside fisheries. Fisheries interests outside of Kodiak desired a better understanding of harvests of “non-local” sockeye salmon in Kodiak area fisheries; and area biologists who sought to understand production dynamics of area stocks wanted better stock-specific harvest information for improvement of brood tables, run-reconstructions, and escapement goals for local stocks. Funding constraints resulted in a limited geographic scope for the study.

The work provided accurate and precise estimates of stock-specific harvests for six Westside fishery areas within the KMA over approximately monthly time periods (June,July, August), during the years 2014-2016. Much more limited sampling occurred in Igvak fisheries. Within this scope, it is a robust study which uses state of the art analytic and statistical approaches to generate estimates for sampled areas and times. It has contributed to brood table improvement for area sockeye stocks, especially Karluk and Ayakulik (ADFG, pers. comm).

As the author notes, the study was not designed to understand migratory patterns of sockeye salmon through KMA (Shedd et al., 2016). The design also does not address finer temporal scale patterns of non-local stock distribution which might describe rapidly changing abundance of migrating stocks in specific areas, or address broader questions about sockeye migratory characteristics in and around Kodiak Island outside of sampled areas. Both are important to inform policy debate on allocating harvests from one management area to another.

Finally, there is no information provided on harvest rates to provide context for actual impacts of non-local stock harvest in Kodiak area fisheries. An understanding of stock-specific harvests with respect to run

sizes (i.e., harvest rates) for those non-local stocks is essential for discussing perceived conservation issues (Habicht et al., 2012).

Sampling

Samples for genetic analyses were gathered at fish processing facilities in Kodiak, Larsen Bay and Alitak. Through close communication with processors, samplers could be in place at facilities when deliveries occurred. Efforts were made to ensure samples only represented fishing in one of the management areas intended for sampling and were taken only from deliveries that could be attributed to the intended area. Deliveries from multiple study areas were not sampled. In Uganik/Kupreanof portion of the NW Kodiak district, where both set gillnet and purse seine vessels contributed to harvests, most samples were taken from set gillnet harvests because seine vessels often had mixed loads (ADFG, pers. com.). Brennan et al., (2017, this volume) point out that gillnets used there are selective for larger fish and sampling from mostly this gear group in Uganik/Kupreanof could bias samples towards Cook Inlet harvests because Cook Inlet sockeye are typically larger fish than Karluk Lake sockeye.

Samples from specific area harvests were collected a number of times, often weekly or more often, throughout the monthly sampling stratum when fish were delivered (Shedd at al., 2016 and ADF&G pers. comm.). Samples were taken on specific dates from fish available on that date. It is not completely clear how samples were randomized within a delivery, but generally, the target sample number (100-400) was taken from the delivery and placed in a separate tote for sampling. These samples represented a bulk sample of tissues from fish for that date. Typically, at least four bulk samples were acquired during monthly periods for each area. Each sample

represents the group of fish delivered on a one or two day period (see Shedd et al. 2016, Appendix B for details).

Post-season, samples for genetic analyses were selected from date-specific bulk samples in proportion to daily harvests for that month, and combined to generate a monthly stock contribution estimate. Previous reviewers of the study have found the general approach of stratified random sampling, sampling in proportion to the harvest and sample sizes to be defensible (Geiger and Quinn, 2017, this volume). To summarize the sampling approach:

- Sampling was adequate for generating monthly estimates of stock-specific sockeye harvest in targeted areas. Samples were collected periodically through the month, and care was taken to ensure that sampled deliveries were from intended fishery areas. Samples selected for analysis were taken from all bulk samples in proportion to the harvest for the month.

- Sampling was not designed to identify times and areas where non-local stocks are most prevalent in KMA or to provide comprehensive information on migration patterns. The study estimated stock proportions and harvests from targeted areas in select Westside fisheries and Igvak using monthly time periods.

- Spatial resolution was limited to major Westside KMA fisheries including Uganik/Kupreanof, Uyak, Karluk/Halibut Bay, Ayakulik/Sturgeon and Alitak, and Cape Igvak in the Mainland District. There are no comprehensive mixed stock analyses for fisheries in Afognak, Eastside District, Olga Bay, Special Harvest

Areas, nor for harvest after August 29, presumed to be mainly local stocks. Authors estimate that sampled areas represented 47-62% of Kodiak sockeye harvest in 2014-2016.

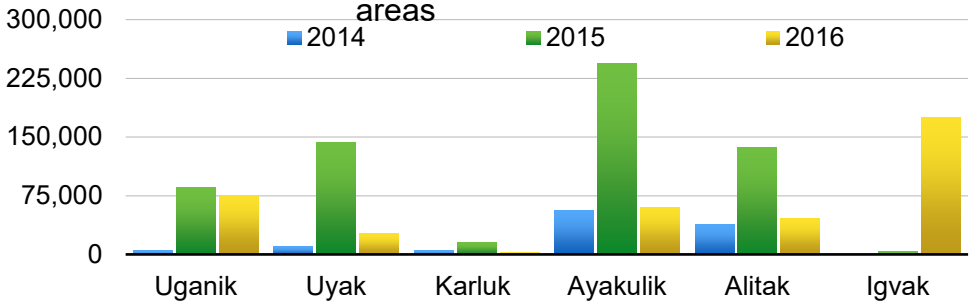
- Temporal resolution was limited to stock compositions for June, July, and August. The periods roughly coincide with fishery management approaches during each period, where early sockeye stocks are harvested in the early stratum (June), pink salmon and sockeye stocks in the middle stratum (July), and late sockeye and pink salmon in the late stratum (August). Harvest stock composition within the monthly periods was not examined.

Results: Variation within and between years

Cook Inlet Stocks

There are very large inter-annual differences among sampled areas in KMA for harvest of Cook Inlet genetic reporting group. Annual estimates of Cook Inlet harvest numbers for all sampled KMA fisheries varied by an

Figure 1. Annual harvests of Cook Inlet bound sockeye salmon within individual Kodiak Management sub-areas



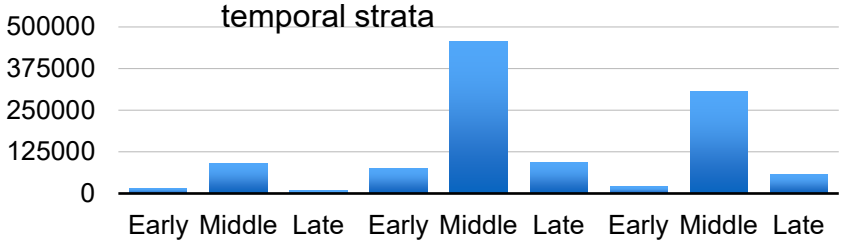
order of magnitude between years, especially evident for Uyak, Ayakulik/Sturgeon, and Alitak, where 2015 estimates far exceeded either adjacent year. Uganik/Kupreanof harvests of Cook Inlet fish in 2016 were

comparable to those in 2015 and Igvak had a single, large catch of Cook Inlet stocks in July 2016. Estimated harvests of Cook Inlet reporting group in 2014 were uniformly small for all sampled areas (Figure 1).

It is also clear that incidental harvest of Cook Inlet sockeye stocks in July (middle stratum) were dramatically larger than early or late strata in 2015 and 2016 (Figure 2). This is particularly pronounced for Alitak and Ayakulik/Halibut Bay harvests. For the Alitak District, harvests of Cook Inlet stocks in July (middle stratum) were an order of magnitude higher than early or late strata in all years. Harvests were more than three times larger in 2015 than middle strata in 2014 or 2016 (Figure 3). July (middle stratum) harvests of Cook Inlet stocks in Ayakulik/Halibut Bay were also highest in all years, and much higher in 2015 (Figure 3).

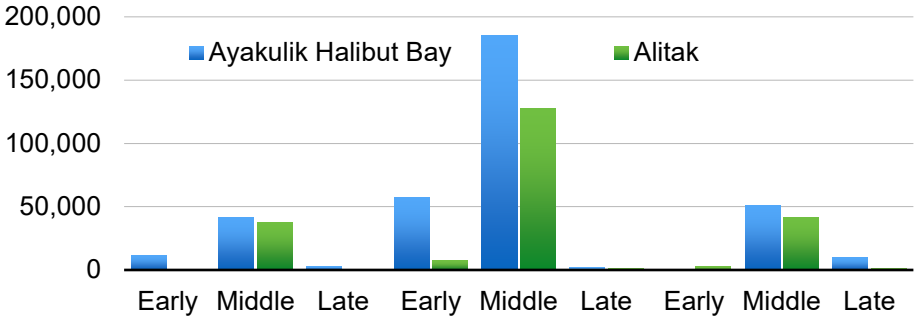
Higher incidental harvest of non-local sockeye in 2015 are likely associated with a very large pink salmon run. At 33 million, pink salmon harvest in 2015 was more than 3 fold larger than 2014 and roughly ten times greater than 2016 (Anderson et al. 2016). The large abundance of pink salmon in 2015 resulted in management actions to increase fishing time. Westside commercial fishing periods in 2015 were extended twice in July and many were open for the majority of August (Anderson et al., 2016). Larger incidental harvests of Cook Inlet sockeye in Westside

Figure 2. Harvests of Cook Inlet bound sockeye salmon in Kodiak Management Area among all sampled areas and years, by temporal strata



isheries during 2015 may partially be explained by pink salmon bundance, reflecting management actions in complex, multi-species fisheries.

Figure 3. Harvest of Cook Inlet bound sockeye salmon by temporal strata, over all years, in Ayakulik/Halibut Bay and Alitak sub-areas of KMA.



While Shedd et al. (2016) is the first genetic stock identification study to focus on KMA, it is modeled after the large WASSIP study which also revealed wide variation in stock specific harvests between and within sampling years, especially for those fisheries known to harvest a mixture of stocks on the South Alaska Peninsula (Dann et al., 2012). The East of WASSIP (EOW) reporting group in that study is a good example. It represents mixed stock analysis assignments made to stock groups beyond Chignik, the Eastern boundary of WASSIP. Specific stock composition of EOW reporting group is unknown, but it likely contains significant and variable proportions of Kodiak, Chignik and Cook Inlet stocks.

- For the Western and Perryville Districts within Chignik Management Area, samples from the same 10 day time interval in July (7/20-7/31) showed EOW reporting group harvest proportions more than twice as high in 2007 (38.8%) as 2008 (14.9%).

- For the Shumagin Islands June fishery, large differences were also observed for the EOW reporting group proportions among years and within weekly sampling periods. In 2006, among three sampled strata in June, EOW proportions ranged from 18.6% to 43.6%. In 2007, proportions for the same weekly strata ranged between 4.9% and 16.5%. For comparable strata sampled in 2008, the range was 9.4% to 10.6%. Over the three year period, harvest proportions for EOW reporting group in Shumagin June fisheries varied nearly nine fold within the month of June.

- For Dolgoi Area June fisheries, among weekly strata, proportions of EOW reporting group ranged from 17.1% to 39.5% in 2006, 35.8% to 56.2% in 2007, and 7.4% to 27.4% in 2008. EOW proportions varied by nearly 8 fold in Dolgoi within and among years in the WASSIP study (Dann et al., 2012).

Both WASSIP investigators and Shedd et al. (2016) express pointed caution about making inferences beyond their three year study periods. Like any GSI study, the data represent environmental and fishery conditions during those years and changes in relative proportions of reporting groups will be influenced by prosecution of fisheries and ocean conditions (physical and biological) which affect fish migrations. The wide

variation observed in WASSIP between weekly sampling intervals among years demonstrates how much stock specific harvests may change within a monthly period. The broad inter-annual variation in WASSIP and the recent KMA study should emphasize the inherent uncertainty in our understanding of stock vulnerability to commercial fisheries from year to year and within a fishing season.

Results: Measuring Impacts

Shedd et al., (2016) showed that over a three year study period, highly variable numbers of Cook Inlet sockeye salmon were harvested in KMA at some locations and times. However, these data alone provide little insight into impacts of these non-local harvests on Cook Inlet runs. Fishery stakeholders in the WASSIP study, from Area L to AYK, insisted that reporting of stock proportions be accompanied by harvest rates, so that stock-specific harvests could be assessed in relation to their respective run sizes (Habicht et al., 2012). The importance of this exercise is clearly demonstrated by WASSIP data for Outer Port Heiden (OPH) harvests during 2007-2008. Among six sampled time strata for OPH fisheries in 2007-2008, Bristol Bay stocks represented 65%-90% of the sample, while harvest rates on Bristol Bay fish for the same two years were less than 1% (Dann et al., 2012, Habicht et al., 2012). Significant numbers of sockeye bound for Bristol Bay were harvested in OPH, with negligible effect on the overall run.

Though no harvest rates were reported, Shedd et al. (2016) produced analyses to distinguish among four different genetic reporting groups within broader Cook Inlet harvests, including Susitna River, a currently designated stock of concern (Shedd et al., 2017). Overall, Susitna fish represented the

smallest component of incidental Cook Inlet harvests in KMA, representing 0.3% to 4.4% of KMA commercial sockeye harvests in sampled fisheries during 2014-2016 (Shedd et al., 2017). They represented only 0.1% to 2.4% of the total KMA sockeye harvest for study years 2014-2016.

Having dispensed with a biased sonar program (Fair et al., 2009), assessment of escapement for Susitna sockeye is now made by three weirs on Judd, Chelatna and Larson Lakes. Based on mark-recapture experiments in 2006-2008, Fair et al. (2009) estimated that combined Chelatna and Judd Lake escapements represent about 42% of Yenta drainage escapements and Larson Lake represents roughly 52% of mainstem Susitna escapement. Escapement goals for these lakes were established in 2017. Over the last decade, goals for Chelatna have always been met or exceeded, Judd was below goal in a single year, and Larson missed three goals by less than 20% (Munro, 2019). Escapements to these index lakes by themselves do not suggest a concern for conservation of Susitna fish. Other Lakes, such as Shell, once estimated to account for 10% of Susitna drainage sockeye production, have been severely impacted by pike predation and Beaver dams, and produce far fewer sockeye than in the past (Shields and Frothingham, 2018).

If management actions were taken to reduce harvest of Susitna bound sockeye in KMA, it is important to consider the fate of these “savings” and how we could evaluate effects of these actions. Any incidental harvest of Cook Inlet stocks avoided in KMA fisheries would be subject to a variety of harvest and natural mortalities before reaching spawning grounds, as they pass through fisheries in Lower and Upper Cook Inlet. Recent estimates of harvest rates on Susitna origin sockeye in Upper Cook Inlet fisheries range widely, but average 38%, 2006-2015

(Erickson, 2017, ADF&G report to Board of Fisheries). A large proportion of these fish would be harvested in Cook Inlet fisheries before reaching their natal streams and lakes.

Importantly, impacts of Susitna bound sockeye harvest in KMA on annual Susitna runs probably cannot be measured with confidence for two reasons. First, Shedd et al. (2017) used a genetic baseline that includes populations throughout the Susitna/Yentna drainage but does not distinguish fish which may be destined for Judd, Chelatna and Larson Lakes. The lake stocks can be justified as a separate JCL reporting group in Cook Inlet genetic studies (Barclay, 2018). As a result, the relationship between KMA harvest of Susitna reporting group and goals established to index Susitna escapement is unknown because KMA harvests of Susitna stocks cannot be attributed to any of these lakes.

Also, recent mark recapture studies suggest large uncertainties with estimating drainage wide escapements to Susitna drainage (Yanusz et al., 2007). Results from 2006-2008 studies revealed wide 95% confidence intervals (2006, 335,448 - 500,946; 2007, 292,867 - 362,597; 2008, 320,763 - 398,317) for escapements of sockeye to Yenta and Susitna Rivers combined (Erickson, ADFG report to Board of Fisheries). The highest estimated catch for Susitna fish in any KMA stratum, without accounting for additional harvest and predation in Cook Inlet, falls within those confidence intervals. It is unlikely that effects of reducing harvest of Susitna fish in KMA could be detected in Susitna run estimates.

In 2014-2016, estimated harvest of Susitna fish in Upper Cook Inlet fisheries was 3 fold to more than 40 fold greater than in KMA (Barclay, 2018, Shedd et al., 2016). Attempts to conserve Susitna fish must primarily

include Cook Inlet fisheries, where savings are more efficiently realized and can be measured.

Cape Igvak

The management plan for Cape Igvak has been in place since 1978. The Cape Igvak fishery is one of only two areas in the state (the other is Southeast District Mainland) in which harvest and escapement triggers from an adjacent management area (both Area L-Chignik) must be met before the fishery can open. For this study, no Igvak samples were taken in 2014 because low Chignik harvest numbers kept the area closed to commercial harvest. In 2015, only the July stratum (middle) was sampled as Igvak was again closed at first due to inadequate harvests in Chignik. Harvest of Chignik fish in Igvak was estimated as 2,059 fish. In both 2014 and 2015, the management plan had its intended effect of keeping Igvak closed or limited when Chignik harvests were low. In 2016, with a stronger Chignik run, an estimated 114,412 Chignik sockeye were harvested in the early (June) stratum. A little more than 10,006 Chignik fish were harvested in July. With only three temporal strata sampled over a three year period, there is no new information on harvest patterns of Chignik fish at Igvak that would support changes to the management plan. While it is clear that some Chignik fish are captured at Igvak (which is reason for the management plan), one data point an order of magnitude greater than the other two reveals dramatic swings in non-local stock abundance. There is no data in this study that supports the presumption in the management plan that 90% of sockeye salmon harvests in Igvak are Chignik bound fish.

Management Plans

The management of KMA fisheries is guided by a number of management plans including the Westside Management plan (5AAC 18.362) and the Alitak District Management plan (5AAC 18.361), most relevant to this genetics study. While each has very specific management direction for date ranges and particular areas, the central theme is prosecution of traditional fisheries to sustainably harvest early and late runs of sockeye salmon to Karluk, Ayakulik, Upper Station and Frazer Rivers, as well as harvest pink, chum and coho salmon to a variety of locations in July, August and September. The plans have an odd year emphasis for pink salmon management as these are typically larger than even year runs in KMA.

From a biological perspective, successful fisheries management in Alaska is measured through achievement of escapement goals. The Alaska Board of Fisheries pays careful attention to escapement goal performance as a yardstick for sustainable management. For Karluk early sockeye, goals have been achieved or exceeded every year since 2012, and for the late run, since 2010. For early and late sockeye runs to Ayakulik , goals have been achieved every year since 2010. For early Upper Station stock, goals were achieved in 2017 and 2018 and for late Upper Station, goals have been met every year since 2010. For Frazer Lake sockeye, goals have been met every year since 2010. Odd year pink salmon goals in the Kodiak Archipelago have been met or exceeded every year since 2011 (Munro, 2019). Recognizing that scientifically defensible escapement goals are foundational for maximizing yields in future years, it seems clear that

KMA fisheries management has been successful and that these management plans are working well.

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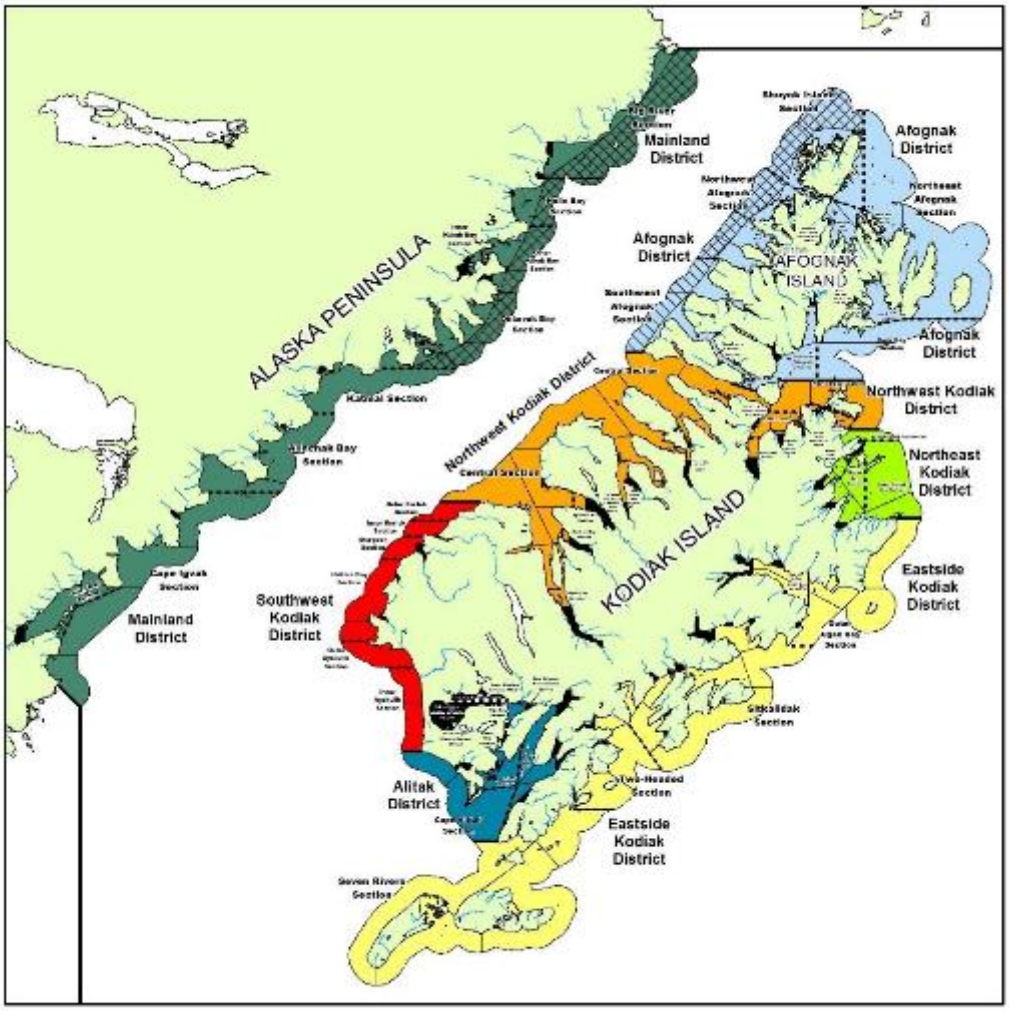

Review of Shedd et al. (2016): *Genetic Stock Composition of the Commercial Harvest of Sockeye Salmon in Kodiak Management Area, 2014-2016*

Report to the Kodiak Salmon Workgroup

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September 11, 2017

Executive Summary

The Kodiak Salmon Workgroup contracted us[1] to provide a scientific review of the report by Shedd et al. (2016) entitled *Genetic Stock Composition of the Commercial Harvest of Sockeye Salmon in Kodiak Management Area, 2014-2016*. This review consists of an examination of the scientific merit of the study, its utility compared to previous studies, an interpretation of how the results should be viewed in terms of the magnitude of interceptions of Cook Inlet sockeye salmon in the Kodiak Management Area's commercial fisheries, and thoughts about further investigations that may shed additional insight into Kodiak and Cook Inlet stock compositions of sockeye salmon.

Our primary findings:

1. From the point of view of fishery policy, the most important statistic is the *stock-specific harvest rate*, which is not reported in the Shedd et al. (2016) document for stocks outside the Kodiak Management Area. What is reported is the *stock-specific contribution rate*. Stock composition estimates represent the proportions of a catch that was made by various stocks in a particular spatial and temporal stratum or groups of strata. In contrast, the harvest rate describes the proportion of an annual return that was harvested in a fishery or group of fisheries. Consequently, a fishery may show a large contribution rate for a stock, but the total effect on that stock may be quite small. We illustrate this phenomenon below.
2. The new genetic stock composition approach used in this study is superior to other approaches used in the past, because the real stock composition is estimated rather than inferred from less reliable measurements (e.g., length composition). The use of a Bayesian modeling approach to estimate stock composition is state-of-the-art and allows for the appropriate treatment of random variability due to both random error caused by sampling the fishery mixture and also from the sampling of the contributing stocks.
3. The stratified sampling design used is appropriate with respect to accuracy and precision of stock composition (relative and absolute). It is clear that the authors devoted substantial attention to implementing the sampling design with the intent of obtaining a random or representative sample within combinations of major regional and temporal strata. Further information would be desirable about how the implementation was conducted on finer spatial and temporal scales to justify the assumption of a random or representative sample. For example, how was an individual fish selected for genetic sampling and were there protocols established to prevent selecting fish with particular physical characteristics, such as size?
4. Similar to past studies, results from the study revealed substantial variability in stock composition across years, among spatial strata, and among temporal strata. Further study may be desirable to determine if there are consistent patterns in this variability across years, spatial strata, and temporal strata. Continued genetic sampling and analysis in the future would thus be desirable.

Introduction and Overview

We were asked to provide a scientific review of the Shedd et al. (2016) titled *Genetic Stock Composition of the Commercial Harvest of Sockeye Salmon in Kodiak Management Area*. This

[1] See brief biographical statement in Appendix A

complex 154-page report describes an extensive genetic analysis followed by a statistical analysis of the genetic data for Kodiak area fisheries in catch years 2014, 2015, and 2016. The principal genetic tools that were used for this study were the single nucleotide polymorphism, or SNP, approach. Here we will comment on scientific criticisms of the study that appear relevant, we will briefly comment on the various methods and techniques that were used, and we will offer a broad assessment of the significance of the major findings. As we will explain in more detail below, the study appears to have been carefully conducted and the numerical estimates appear to be well crafted and reliable.

The Alaska Department of Fish and Game had previously tried to use scale pattern analysis and an analysis of fish size to estimate the proportion of non-local stocks in the Kodiak Management Area. For various technical reasons neither of these techniques were very successful. In one of the last reports on the attempts to use fish size for this purpose, Vining (1996) wrote, "As the 1995 analysis indicates, this methodology continues to generate only rough estimates, some with little confidence." It is the opinion of Vining that "other techniques, such as genetic stock identification, tagging or scale pattern analysis should be evaluated for use in the future, if more precise estimates of stock composition for sockeye salmon caught within the [Kodiak Management Area] are desired." This leads us to the present genetic study by Shedd et al. (2016).

The genetic analysis of stock mixtures rests on several assumptions. The analysis starts with the definition of a *catch mixture*, because the catch is presumably made up of a mix of stocks. Importantly, the number of contributing stocks must be known, they all must be sampled, and the genetic character of each stock must be established. Next, a representative sample of the catch mixture must be drawn and the genetic character of each specimen in the catch sample must also be established. Finally, a complicated statistical algorithm can then be used to produce an estimate of the proportion of each of the stocks in the mixture by comparing the genetic characterizations of each fish in the catch mixture to the previously established genetic characterization of the contributing stocks.

A complete analysis must include a study of both the accuracy and the precision of the estimates. In this context, *accuracy* refers to the absence of any statistical bias or other kinds of systematic errors that would consistently cause specific stock estimates to be too high or low. Here *precision* refers to errors that are caused by using only a sample from the stock of origin and the catch mixture, rather than an examination of every single fish in the fishery and every single fish in the spawning stocks. Generally, accuracy is harder to study, detect, and control, while precision can generally be controlled by increasing the sample size. Also, precision is usually studied by looking at the variation from one specimen to another in the samples. Precision measures are usually offered in the form of confidence intervals, standard errors, or coefficients of variations.

Sampling Design

The goal of the study by Shedd et al. (2016) is to determine stock compositions of sockeye salmon within the Kodiak Management Area. Consequently, sampling was restricted to the Kodiak Management Area, rather than to the overall range of sockeye salmon in the western Gulf of Alaska. The authors defined six Kodiak spatial strata of interest (called subregional sampling groups) for *sampling* genetic tissues, comprised of (1) Uganik-Kupreanof, (2) Uyak, (3) Karluk-Sturgeon, (4) Ayakulik-Halibut Bay, (5) Alitak, and (6) Igvak. The first five are located around Kodiak Island, while Igvak is part of the mainland district. The Chignik

regional reporting group had combined estimates from subregions Black Lake and Chignik Lake. Four other regional spatial strata outside of Kodiak and Chignik were West of Chignik, Cook Inlet, Prince William Sound, and South of Cape Suckling. The report did not contain justification for this particular choice of spatial strata, but suggests that considerations included areas with active management and those that are used in run reconstructions to aid management.

One confusing area is that several spatial scales are referred to in the report. For *reporting* purposes (instead of *sampling*), there are a total of 14 subregional *reporting groups* listed on page 2 that constitute the entire western Alaska area. The report designates ten of these groups as *subregional reporting groups* within the Kodiak (8 subregions) or Chignik (2 subregions) *regional reporting groups*. Six regional reporting groups including those outside of Kodiak and Chignik are listed in the tables, with subregional breakdowns for the 8 Kodiak subregions and the 2 Chignik subregions. In the end the system does seem to be consistent; however, we recommend a simpler and clearer description of spatial divisions. *These definitions of spatial strata must be understood to understand the tables and figures of results, which include both regional reporting groups and subregional reporting groups.*

The report indicates that temporal strata are also considered in combination with the spatial subregional strata: Early, Middle, and Late (see page 3 in the Shedd et al. (2016) report. The temporal strata are consistent with patterns that have been observed in past studies.

The sample size goal was to extract 380 tissue samples from each time-area stratum; no reference was provided for this number. The sampling within temporal strata was intended to be proportional to daily abundance. When this was not possible, the total sample size was obtained by sampling days with sufficient additional samples at random until the total of 380 was achieved, a reasonable approach.

We could not determine if sampling was representative within spatial strata, although the intent of the authors appears to be sampling proportional to harvest, a reasonable goal. It would be helpful to have a brief description elaborating the protocol used to achieve this goal.

The sampling design most appropriate for multiple strata with high variation among strata, to obtain high precision and accuracy, is stratified random sampling (Thompson 2016). In the future it would be desirable to show that high variation is present and the improvement in precision by using stratification over simple random sampling. One advantage to using a proportional allocation of sample size with respect to within stratum variation is that different choices for strata are not likely to produce inaccurate estimates. Nevertheless, it is not necessary to use proportional sampling to justify the use of stratified sampling in terms of accuracy, as long as a representative sample is obtained within each stratum. In particular, the use of a fixed sample size of 380 for all spatio-temporal strata is completely acceptable. (Although it may not be the most efficient allocation scheme, it does not induce estimation bias.)

The use of stratified random sampling also has a desirable product in that both relative and absolute stock compositions can be estimated both for individual strata and for combinations of strata, including that portion of the entire Kodiak Management Area that was sampled (not every single fishery was sampled). The main reason for this ability is that catches are known for all spatio-temporal strata. This is one fundamental principle that

makes estimation across strata intuitive, accurate, and precise, because relative stock compositions are projected to the total catch to get absolute stock compositions by strata that can then simply be summed across a set of strata of interest.

An additional feature of the sampling design is a set of data quality control procedures regarding the genetic data to avoid the inclusion of erroneous data into the analysis (pages 8–9). Thus, we were unable to uncover any appreciable flaws in sampling, genetic data processing, or genetic analyses in the study.

In summary, we believe that the overall sampling design of using stratified random sampling is appropriate for the genetic analysis of estimating stock composition of sockeye salmon in the Kodiak Management Area. Further studies should be done to consider alternative stratification choices both within space and time and to justify the sample size goal of 380 samples per stratum.

Policy Issues and Stated Goals for the Study

In the introduction of the Shedd et al. (2016) report, the reader finds that the stated purpose of the study was to "sample the major sockeye salmon commercial fisheries in marine waters of [the Kodiak Management Area] from June through the end of August and use genetic mixed stock analysis (MSA) to estimate stock compositions and stock-specific harvests." Later in the report, the reader finds this statement about the goal of the project: "The overall goal of this project is to provide information that will be useful for reconstructing runs, building accurate brood tables to define escapement goals, and refining management by identifying spatial and temporal harvest patterns of *local* and *nonlocal* stocks (emphasis in the original)." Later, the reader finds four stated objectives, including "report [genetic mixed stock analysis] results of stock-specific harvests of sockeye salmon sampled from *selected* commercial fisheries in [the Kodiak Management Area], 2014—2016 (emphasis added)," and "characterize where stocks were harvested from *select* commercial fisheries (again, emphasis added)." This report did not have the express purpose of making arguments regarding allocation decisions by the Alaska Board of Fisheries.

Regardless, the study does conclusively demonstrate that sockeye salmon bound for Cook Inlet were caught in some times and in some areas in the fishing years studied. In the case of the Kodiak Area, there really was no reason to believe that the commercial harvest was made up of only single stocks that originated in the Kodiak Management Area. That is, a finding of rich stock mixtures in at least some times and areas should not have been surprising. There have been many long-standing questions about the degree to which stocks are mixed in the Kodiak Management Area. Summarizing historical tagging studies, Barrett and Swanton (1991) report that sockeye harvests in the North Shelikof Strait in the 1940s, 1970s, and 1980s ranged from 30% to 100% Kodiak fish and 0% to 59% Cook Inlet-origin fish. Moreover, Barrett and Swanton concluded there were large numbers of Cook Inlet bound fish in the North Shelikof Strait fishery in July of 1990.

Contribution Rate Versus Harvest Rate

There are two important rates or proportions that can be derived from stock composition analysis and discussed before policy-making bodies, such as the Alaska Board of Fisheries:

the *contribution rate* and the *harvest rate*. These two statistics have very different significance to management. These two rates have often been confused in conversations among fishermen, in testimony before the Alaska Board of Fisheries, and in conversations with members of the press. The percentage that each stock makes up in a mixture of stocks is called the *contribution rate* (or sometimes the *stock proportion*). For example a fishery may have harvested 50 fish, and 40 of those fish might be from Stock A, with 10 fish from Stock B. Then the *contribution rate* of Stock A is 80%=(40/50)100%. For the purposes of management that could be either high or low. But if the contribution rate was 80%, then this does *not* mean that 80% of the stock was harvested; a harvest rate can be estimated only with abundance or run-size information for the stock of interest.

A large number for the contribution rate is not necessarily important to management, but it could be. If the original size of Stock A was 10,000 fish before this harvest, then the *harvest rate* on Stock A in the catch mixture would be 40/10,000 = 0.4%—which may be considered insignificant. Alternatively, if the original size of stock A was only 150 fish before the harvest, then the harvest rate would be 40/ 250 = 27%—which would usually be considered significant from a management perspective. Although moderate-to-large contribution rate statistics can lead to misplaced anxiety or even outrage, the most important statistic for management policy is the harvest rate, which is the rate that is most clearly related to the population dynamics of a stock.

Technical Comments on Bayesian Analysis and Uncertainty Measures

The statistical analysis was carried out using the Bayesian method of Pella and Masuda (2001). We contend that this method is a reasonable approach with several advantages over the more traditional *maximum likelihood* approach. As this is a Bayesian approach, there are some differences between the interpretations of the measurements that may be confusing and unnecessarily tedious to some readers of the Shedd et al. (2016) report. In the method of Pella and Masuda (2001), the unknown contribution rates (or stock mixing proportions, as they call them) are treated as unknown random variables rather than constant and unknown parameters in the maximum likelihood approach. The analysis proceeds by simulating the probability distributions of these random quantities, with the genetic data used to help develop these distributions.

In a Bayesian analysis, uncertainty in stock contribution rates is frequently displayed by the use of *credible intervals* rather than *confidence intervals*. For example, in Table 3 of the Shedd et al. (2016) report, for the Kodiak reporting group the 90% credible interval runs from 80.9% to 88.1%. The correct interpretation of this interval is that given all of the stated assumptions, *the probability is* 90% that the true value is found between 80.9% and 88.1%, given a list of assumptions. Many people, incorrectly, think this is exactly what a 90% confidence interval is, but this is a mistake for some technical, statistical reasons. For the purposes of readers of this report, we note that the Bayesian results will often closely approximate the more traditional results (Pella and Masuda 2001), so that there should be no harm in simply interpreting the Shedd et al. (2016) credible intervals as the more familiar 90% confidence intervals to investigate uncertainty in the stock composition estimates. While every one of the assumptions that underpin the analysis is probably not strictly true, these intervals do seem to be a very reasonable guide to the precision in the estimates. Based on the reported credible intervals and based on the assumptions stated in the report,

the Shedd et al. (2016) estimates appear to be both accurate and precise enough for the purposes of the study.

The Results

In trying to understand the results of the analysis, readers of the Shedd et al. (2016) report may find Figures 8 through 19 helpful, especially when paired with the maps provided in Figures 1–7. Figures 8, 10, 12, etc. (the even-numbered figures) show the estimated contribution rates (or stock mixing rates) for stocks using two levels of detail for the authors' *subregional* and *regional reporting groups* mentioned above. These estimates are then reported by specific time-area catch strata. At the highest level of aggregation there are six regional reporting groups, or what might be considered stocks in the broadest sense: (1) West of Chignik, (2) Chignik, (3) Kodiak, (4) Cook Inlet, (5) Prince William Sound, and (6) South of Cape Suckling. These groups may be the most useful for discussions about fishery management policy. Additionally there are estimates for 10 specific subregional reporting groups, or what might be considered stocks in a more narrow sense, in the Westward Region, and these estimates may be more useful for actual managers or to look at the reasonableness of some of the estimates. Similarly, the odd-numbered figures (Figures 9, 11, 13, etc. in Shedd et al. (2016)) have the stock contribution rates re-expressed as the stock-specific *number of fish harvested* (compared to rates in the previously mentioned figures) in the mixtures.

The usual pattern in these figures is that the majority of the fish harvested in each time-area grouping originated in the Kodiak management area. There are some notable exceptions, especially in 2015. For example, in the Ayakulik-Halibut Bay area, a large fraction of the fish were classified to be of Cook Inlet origin, especially in 2015 during the July 4 to August 1 period (Figure 14 in the report by Shedd et al. (2016)). When viewed in terms of numbers of fish, rather than proportions, the effect looks even stronger (Figure 15). In the Alitak district the catches of fish classified to Cook Inlet exceed the number of fish classified to the Kodiak area in two years: 2015 and 2016. Here too, the effect looks even stronger when views as the number of fish harvested 2015 (Figure 17). However, when summing over time and area, in all study years fish of Kodiak area origin dominate the catch, although catches of Cook Inlet-origin fish increased in 2015, and to a lesser extent, remained high in 2016, when compared to 2014 (Figure 20 in Shedd et al. (2016)).

Questions about why the harvest of Cook Inlet fish might be higher or lower in specific times or areas are beyond the scope of this review. One obvious question is could this variation in the proportion of Cook Inlet-origin fish be due to variation in the sizes of sockeye salmon runs in Cook Inlet?

To get at this question we simply ignored Lower Cook Inlet and brought together run size estimates for Upper Cook Inlet (Alaska Department of Fish and Game, retrieved August 17, 2017), together with the Shedd et al. (2016) estimates of the harvest of Cook Inlet bound fish in the Kodiak Management Area (taken by eye from Figure 20 or from Tables 67–69). As a point of reference, Stopha (2017) projected that approximately 0.3 million sockeye salmon would be returning to hatcheries in Lower Cook Inlet 2017. We assume that the times and areas sampled by Shedd et al. (2016) represent areas where interceptions of Cook Inlet fish would have been considered to be most likely, although we do not know that is true. Here again, as a point of reference, the total fish accounted for by the six Regional Reporting

Groups in Tables 67–69 was about 50%–60% of the total reported harvest for the Kodiak Management Area for the three study years (catch numbers from Munro 2015 and later reports in this series). Even though not all times and areas in Kodiak Management Area were sampled and even though there was some sockeye salmon production in Lower Cook Inlet, we expect that the Shedd et al. sockeye salmon catch estimates of Cook Inlet bound fish caught in the Kodiak Management Area divided by the estimated Upper Cook Inlet run size to provide a crudely reasonable—even if slightly too low—approximation to the harvest rate on Cook Inlet-origin fish harvested in the Kodiak Management Area (Table 1).

Although there are only three years available for comparison, it does not appear that changes in run size explain the difference in harvest rates on the Cook Inlet stocks. The highest harvest rate on Cook Inlet stocks was in 2015, the year with the highest in-Inlet run size among the three study years, but the second highest harvest rate is on the year with the lowest run size (Table 1 below).

Table 1. Upper Cook Inlet run size in millions of sockeye salmon **(A)** (from ADF&G), the estimated harvest of Cook Inlet-origin sockeye salmon caught in the Kodiak Management area in millions of fish **(B)** (From 67–69 in the Shedd et al. (2016) report), and the approximate harvest rate (estimated harvest in the Kodiak Management Area divided by the in-Inlet run size plus the harvest in the Kodiak Management Area) on Cook Inlet-origin sockeye salmon in the Kodiak Management Area **(C)**.

	(A) Cook Inlet run size	**(B)** Cook Inlet catch in KMA	**(C)** Approximate harvest rate
Year	(millions)	(millions)	in KMA
2010	5.71		
2011	8.68		
2012	6.46		
2013	5.74		
2014	5.54	0.1	2%
2015	6.29	0.6	9%
2016	5.04	0.4	7%

Another important question: were the harvests of Cook Inlet-bound sockeye salmon excessive? Though this is a policy judgment, rather than a scientific question, we note that in the years 2014-2016, the estimated *harvest rate* ranged from 2% to 9%, and did not reach or exceed 10% in any year in the study (Table 1). Some might point out that the way we calculated the harvest rate under-represents its true magnitude—and the estimates in Table 1 very well may be too low. Even so, it would be highly unlikely we have underestimated it by a factor of 2, meaning that the median harvest rate over the three study years would have been almost surely less than 15%, and probably considerably less.

Are there areas where the proportion or numbers of Cook Inlet-origin sockeye salmon are higher than in other areas? Figures 22, 23, and 24 in the Shedd et al. (2016) report are useful for speculating about this question—although it is really impossible to establish a trend with only three years of data. Notice that the area with the highest number of Cook Inlet-origin fish was Ayakulik-Halibut Bay in 2014 and again in 2015. However, in 2016 the number of Cook Inlet-origin fish in this district was much reduced from the previous year, and a larger number of Cook Inlet-bound sockeye salmon was caught in the Igvak area—which had previously been an area with very few Cook Inlet-origin fish harvested.

When time is brought into the discussion the situation also appears murky. The proportion of Cook Inlet-origin fish caught in the Uyak area is relatively low in all sampling periods in 2014 (Tables 15, 16, and 17 in the Shedd et al. (2016) report, yet the proportion rises to relatively high levels (54% and 32%) in the second and third sampling periods in 2015 (Tables 20 and 21). Then in 2016, the proportion was much reduced, with over 80% of the fish harvested in each period in this catch area belonging to the Kodiak reporting group (Tables 23, 24, and 25). This observed variation shows the danger in looking at just three years and thinking that one sees a trend. Further sampling and study is warranted to understand patterns of temporal variation.

The proportion of Cook Inlet-origin fish in the Ayakulik-Halibut Bay area is relatively low (less than 8%) in the first sampling period (June 1 to June 27) in 2014, but that this rises to 24% in the second period (June28 – July 25) of that year, and then falls to about 5% in the last sampling period of that year (Tables 39, 40, and 41). However, in the next year this proportion starts high in the first period (28%), rises to 48% in the second period, and then drops to less than 10% in the last period (Tables 43, 44, and 45). In 2016, the first period contains essentially all fish originating from the Kodiak Management Area (>99%; Table 47), but the proportion of Cook Inlet-origin fish again rises in the second period to nearly 42%, and remains high at 28% in the third period (Tables 47, 48, and 49). A person focusing on the similarities would note that the second sampling period for this district was consistently high in all three sampled years, and that is correct. However, someone focusing on the large year-to-year variation in the proportion of Cook Inlet-origin fish would correctly point out that with three data points it is premature to speculate that this pattern will continue into the future.

Final Comments

The Shedd et al. (2016) report is generally well written, organized, and it offers a reasonable amount of specific details about the actual genetic and statistical analyses. While it is impossible to judge the care, attention to detail, and technical skill that actually went into actual genetic analysis from the written page, the report demonstrates a great deal of

technical sophistication. The sections on "Laboratory Quality Control" appears to demonstrate that the authors did take reasonable care to detect and report on obvious mistakes. The Alaska Department of Fish and Game's Gene Conservation Lab has an excellent reputation for this kind of work. It would be extremely surprising to find that many, if any, outright mistakes were made in either the genetic or the statistical analyses.

The estimates in the Shedd et al. (2016) report seem quite reasonable. Catches were generally dominated by fish that originated within the Kodiak Management Area. Although there are some exceptions, a finer-scale examination shows catches were generally dominated by stocks that originated near the area of harvest. The Shedd et al. (2016) report is technically sophisticated and it contains features that we have found are indicative of a study that is carefully conducted. We found no reason to think that there were any large inaccuracies in the study, and the reported measures of precision provide evidence that the reported estimates are trustworthy and suitable for their intended purposes.

Finally, we note that the estimated harvest rate on Cook Inlet-bound sockeye salmon were below 10% in each year, and substantially below 10% in one year. These harvest rates generally agree with what previous, less accurate studies, have suggested. However, with only three years of measurements, with a large fraction of the catch not sampled, and with large annual variation in those measurements (much larger than the error obtained from the credible intervals), it is very hard to conclude that these results bracket the range of what to expect if the study were to be repeated, or to conclude that these results represent what would happen in a "typical year" (if there ever is such a thing). We recommend that the genetic analyses in this study be conducted to better understand the apparently real variation in stock contribution estimates (both rates and harvests).

These estimates in Shedd et al. would have been more useful for policy discussions if they could be recast in terms of harvest rate rather than contribution rate. In fairness, we note that this was not one of the stated goals for the study, but this appears to be a subject that needs to be addressed in the future. We have tried to crudely approximate the harvest rate using information that was easily accessible to us. While our specific harvest rate estimates can be easily criticized, it is clear that the harvest rate was probably much less than 10% in most study years and almost surely less than about 15% in each year of the study. In the future, we recommend sampling in some of the time and area strata that were not sampled in 2014–2016, or else we recommend some discussion of why specific time-area strata can be assumed to have very low contribution rates for stocks outside the Kodiak Management Area.

Acknowledgments

We thank Heather McCarty for her help in proposing this review and guidance into the scientific and management issues involved.

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Appendix A – Biographical Statements for the Authors

Harold J. Geiger is the chief scientist for the St. Hubert Research Group, a small consulting company in Juneau, Alaska. He previously worked for the Alaska Department of Fish and Game, holding several positions on the salmon research staff of the Division of Commercial Fisheries before retiring in 2007. He held the position of Chief Biometrician in the late 1990s and was the Salmon Research Supervisor for the Southeast Region in the early 2000s. He holds a Master's degree in Statistics from Oregon State University and a PhD from the College of Fisheries and Ocean Sciences at the University of Alaska Fairbanks.

Terrance J. Quinn II, Ph.D. has been Professor of Fish Population Dynamics in the Fisheries Department, College of Fisheries and Ocean Sciences, University of Alaska Fairbanks for 32 years. He obtained his Ph.D. in Biomathematics from the University of Washington in 1980. Dr. Quinn's research focuses on fish population dynamics; estimation of fish and whale abundance; sampling theory; and renewable resource management systems. He is the co-author or co-editor of 4 books and over 100 scientific publications and has shepherded about 40 students through their post-graduate careers. He has been a member of the Statistical and Scientific Committee of the North Pacific Fishery Management Council since 1986 and was a former chair of that body. He is a former member of the Ocean Studies Board of the National Academy of Sciences and served on five of their committees, including two as chair or co-chair. He is an Associate Editor of the Canadian Journal of Fisheries and Aquatic Sciences.

Appendix B: Some Comments on Stock Mixture Analysis

The earliest techniques for developing these estimates were based on simply capturing migrating salmon, tagging them with a visible tag, and then looking for the tags on spawning fish. By comparison, this is a crude technique as it is hard or even impossible to control for how much effort went into looking for tags. That is, a stock with a small contribution to the mixture could result in a large fraction of the recovered tags if, for example, there was a counting weir on the spawning stream of that stock.

A technique that is somewhat more sophisticated is based on an analysis of scale patterns, and this technique was used extensively in the 1980s and 1990s. The technique was based on the assumption that fish originating from different systems had different growth patterns,

which would be represented on the scales of the fish. A large sample of scales needed to be collected for each stock, each year. Then a very large (often over 100 measurements) can be used to characterize the scale pattern for that stock, as the growing conditions that affect the scale patterns change from year to year. A complex statistical algorithm (called a linear discriminate function) is used to look for the specific measurements that show the most differences among stocks. The results from this discriminate function can then be used to classify fish in the fishery mixture to the stock that most likely produced it.

In Lynn Canal in Southeast Alaska, scale patterns were used to estimate the proportions of Chilkat and Chilkoot Lake sockeye salmon in a mixture to both actively manage a gillnet fishery during the fishing season and to study the productivity of the stocks after the fishing season. This was an ideal situation as the number of stocks was small and the patterns were quite different. As the number of stock in the mixture increased beyond just a few, or as the growing conditions among the stocks were more similar, scale pattern analysis estimates become uncontrollably imprecise, and the accuracy of the estimates would also degrade.

In the 1990s, genetic tools showed obvious advantages over other techniques. The first genetic techniques are sometimes called the allozyme techniques. Although these were time consuming and expensive, one of the main advantages was the individual stocks no longer needed to be characterized each year, as the genetic character of the stock changed slowly, if at all. Later, microsatellite techniques replaced allozyme techniques for a number of technical reasons. Finally, the SNP (Seeb et al. 2011) approach, used in this study, is usually thought of as the current state of the art and most cost-effective method of conducting a complex stock mixture analysis.

Reference

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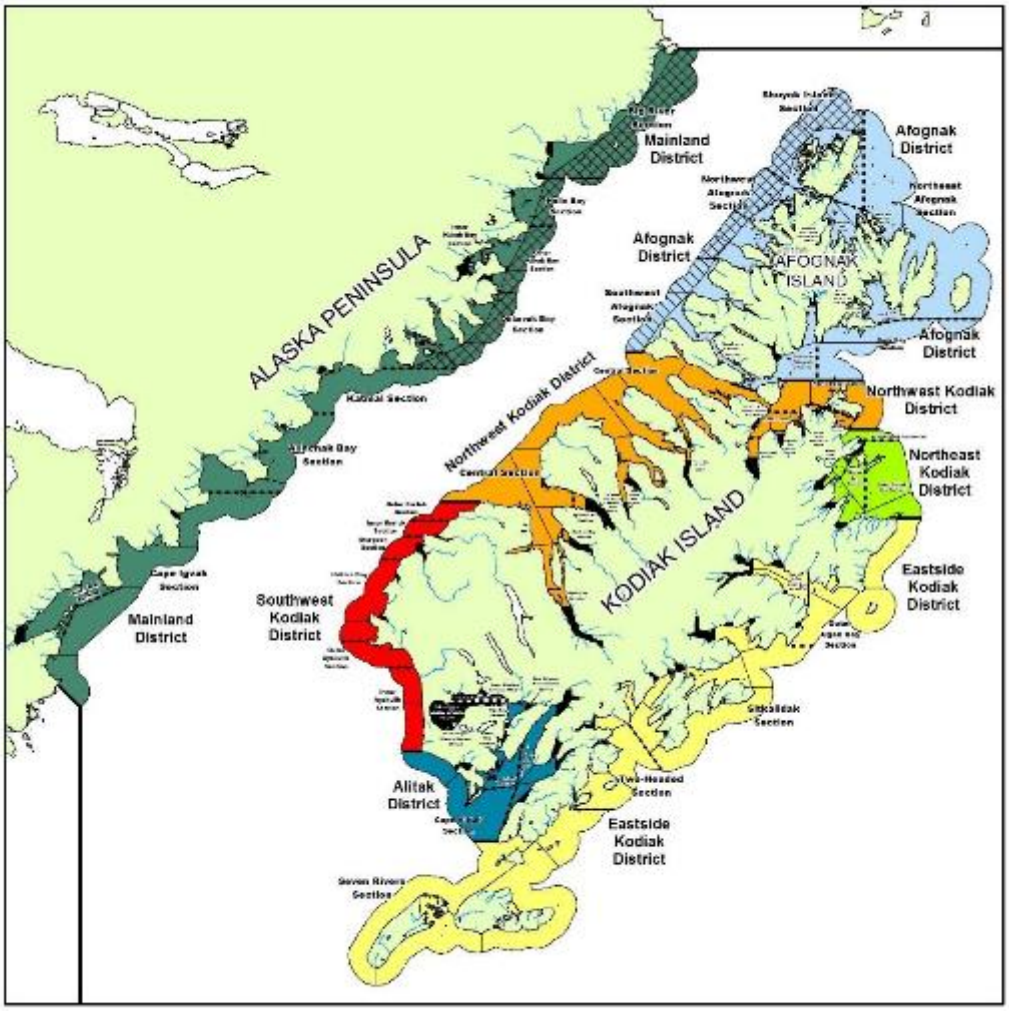

Gulf of Alaska Climate Conditions and Sockeye Salmon Run Timing During 2014-2016

Report to the Kodiak Salmon Work Group

Michael A. Litzow, PhD

Executive Summary

During 2014-2016, staff from the Alaska Department of Fish and Game sampled sockeye salmon in Kodiak Management Area commercial catches to estimate stock-specific contribution rates to the fishery (Shedd et al. 2016). The authors of that report cautioned that "these analyses represent environmental and fishery conditions during a specific period of time…caution must be exercised when extrapolating the results to years, areas, and temporal periods not analyzed because changes in relative abundance among reporting groups, prosecution of fisheries, or migratory behavior due to ocean conditions very likely affect distribution of stock-specific harvests among fisheries" (p. 23).

The current report[2] evaluates the conditions during the years of the genetics study (2014-2016) in order to summarize how well that study may represent "typical" conditions for Gulf of Alaska sockeye runs. The specific goals of this report are to 1) review the state of ocean climate conditions during 2014-2016, 2) evaluate the evidence for effects on sockeye salmon migration and run timing during these years, and 3) summarize implications for applying the findings of the Shedd et al. (2016) genetics study as justification for making changes to sockeye salmon fisheries management in future years.

The primary findings of this work are as follows:

1. **The "Warm Blob" climate event dramatically affected ocean physics across the North Pacific during 2014-2016.** These years were characterized by unprecedented climate conditions in the Gulf of Alaska. Sea surface temperatures and air temperatures were at or beyond previously-observed maxima. River temperatures in South Central Alaska were also higher than ever observed, and river flow volumes were unusually low. Summer sea level pressure was unusually high, which led to reduced wind mixing of ocean water.
2. **Many unusual ecosystem responses were observed in the Gulf of Alaska during 2014-2016**, highlighting the strong effects that unusual climate conditions had on populations and communities at all taxonomic levels, from plankton to fish, seabirds, and marine mammals.
3. **Sockeye salmon showed unusual run timing during 2014-2016.** Catches and escapement were later than usual in many areas, both in Kodiak and Upper Cook Inlet. At the same time, some runs, such Kasilof River sockeye, were earlier than usual. Since no data on at-sea migration patterns of sockeye salmon are available for these years, these findings provide the best available information concerning sockeye salmon migration during 2014-2016, and suggest the possibility for unusual patterns of stock mixing.
4. **Unusual sockeye run timing is directly linked to unusual climate conditions.** The link between climate conditions and run timing is highly nonlinear and accelerating. In general, warmer conditions and increased atmospheric pressure during 2014-2106 were directly related to a tendency towards later overall run timing in sockeye salmon, although some runs were also unusually early.
5. **The rate of physical and biological change currently occurring in the Gulf of Alaska is unprecedented, and suggests the need for caution when re-evaluating long-standing management practices based on a few years of data.** Biological responses to climate disturbance are complex and often time-lagged. The trajectory of fisheries change in the Gulf

[2] See Appendix A – Biographical Statement

of Alaska is therefore impossible to predict, but given the size of the ongoing climate disturbance, the full range of fisheries responses has likely not yet played out. Data from 2014-2016 are likely to be a snapshot of a rapidly changing system, and given the potential impacts of physical conditions on stock mixing, are likely to quickly become outdated as unusual climate conditions continue.

Conclusion: The Gulf of Alaska is currently undergoing rapid change outside the envelope of historical conditions. In this situation, the ability of data from 2014-2016 to serve as a reliable guide for future conditions is highly questionable. These considerations are exactly in line with the caution provided by Shedd et al. (2016) concerning the use of their data in situations materially different from those under which the study took place, and suggests the need for a precautionary approach to possible management changes based on these results.

Background

Unprecedented high atmospheric pressure over large areas of the North Pacific in winter 2013-14 led to reduced wind mixing and Ekman transport, so that normal ocean cooling at the end of summer failed to occur. This event persisted into 2016, and became known as the "Warm Blob" (Bond et al. 2015). In terms of duration, size of area affected, and degree of warming involved, this event became the strongest marine heatwave ever observed globally (Di Lorenzo and Mantua 2016, Hobday et al. 2018). In the Gulf of Alaska, temperatures during 2014-2016 were by far the highest in the historical record (Fig. 1). After a hiatus in 2017, unusually warm temperatures returned in 2018-2019, and warm temperatures are expected to intensify over coming decades (Walsh et al. 2018). The best scientific understanding is therefore that the Gulf of Alaska is entering a period of persistent change.

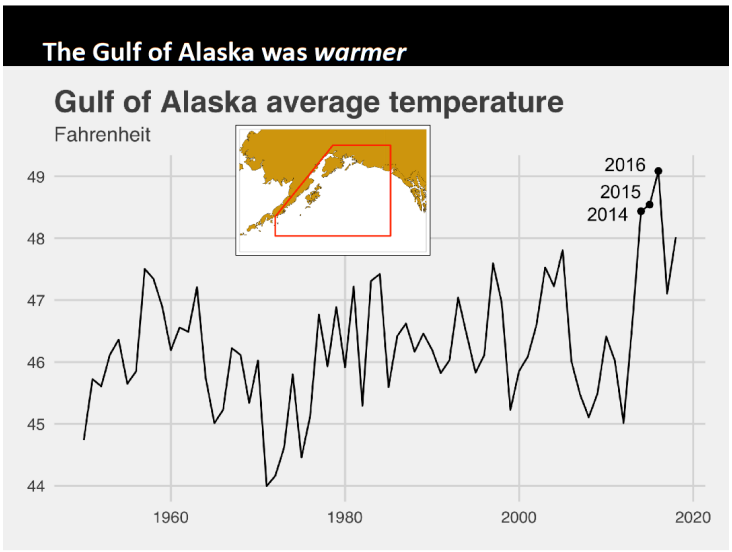

Fig. 1. Gulf of Alaska sea surface temperature (annual means), 1950-2018. Data from NOAA Extended Reconstructed SST v5.

A suite of other highly unusual climate conditions also occurred during 2014-2016 in the Gulf of Alaska. These included air temperatures and river temperatures that were at or above previous historical record high values (Fig. 2). And, in line with the high atmospheric pressure that was the immediate cause of the Warm Blob event across the North Pacific, atmospheric pressure at sea level was generally elevated over the Gulf of Alaska during 2014-2016 (Fig. 3). This high atmospheric pressure was associated with unusually weak wind mixing and wind-driven currents in the Gulf of Alaska ecosystem.

Salmon migration patterns are known to be highly sensitive to physical factors such as ocean temperature, ocean currents, river volume and river temperature (Quinn and Adams 1996, Hodgson and Quinn 2002, Hodgson et al. 2006). Sockeye runs in Cook Inlet are particularly prone to shared patterns of variability in run timing – in other words, unusual migration behavior tends to affect runs across Cook Inlet as a group (Hodgson et al 2006). Given the known sensitivity of salmon migration behavior to physical conditions, the climate event in the Gulf of Alaska has important potential implications for changing patterns of stock mixing in sockeye salmon.

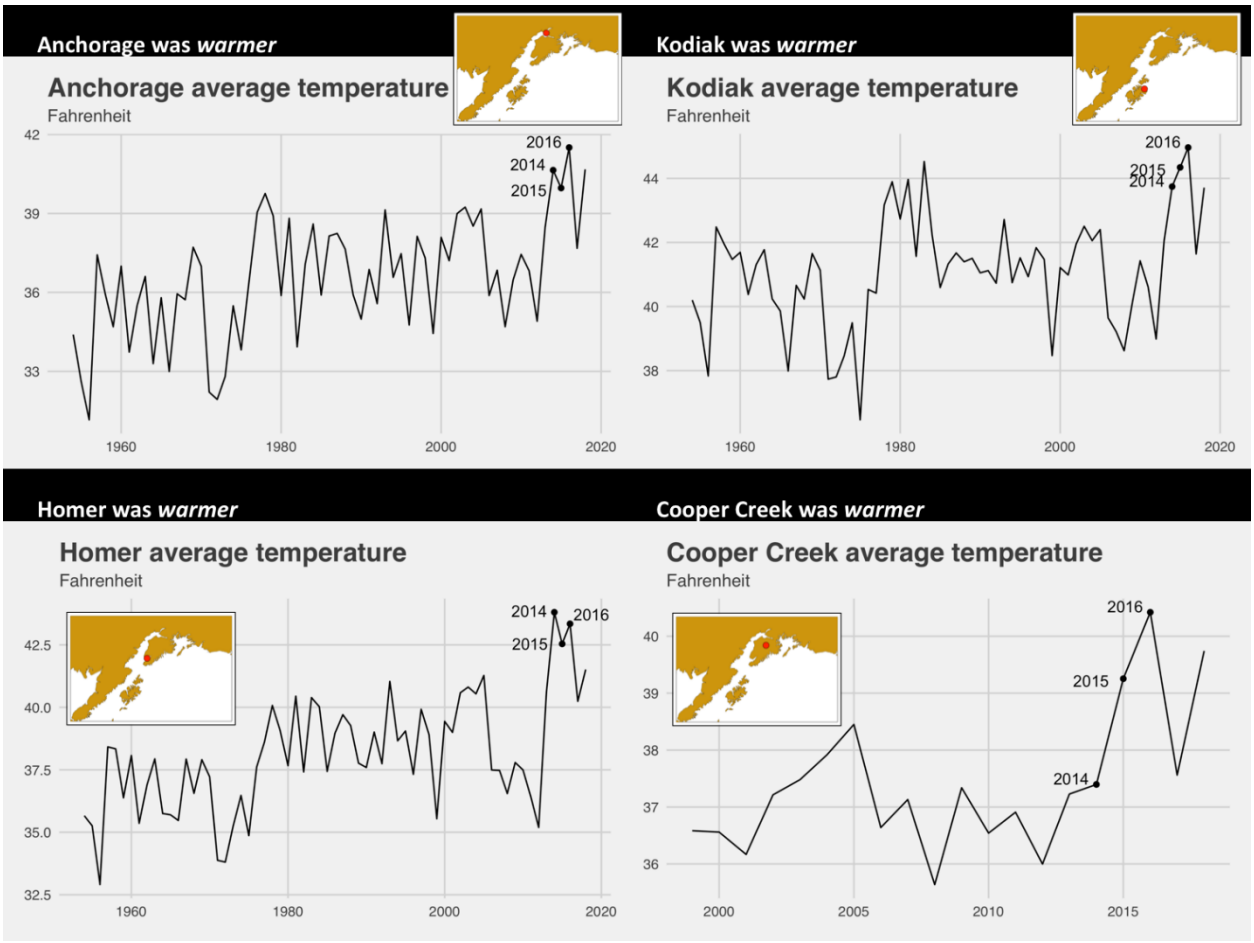

Fig. 2. Unusual air and river temperatures in Southcentral Alaska during 2014-2016.

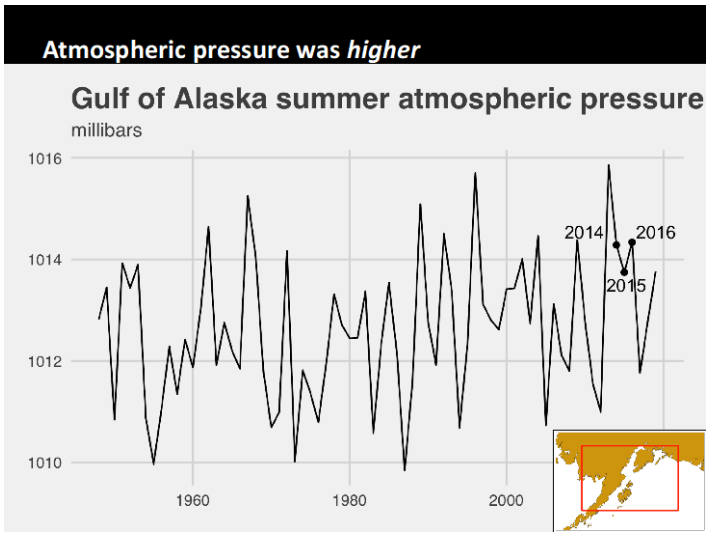

Fig. 3. Summer atmospheric pressure over the Gulf of Alaska, 1950-2018.

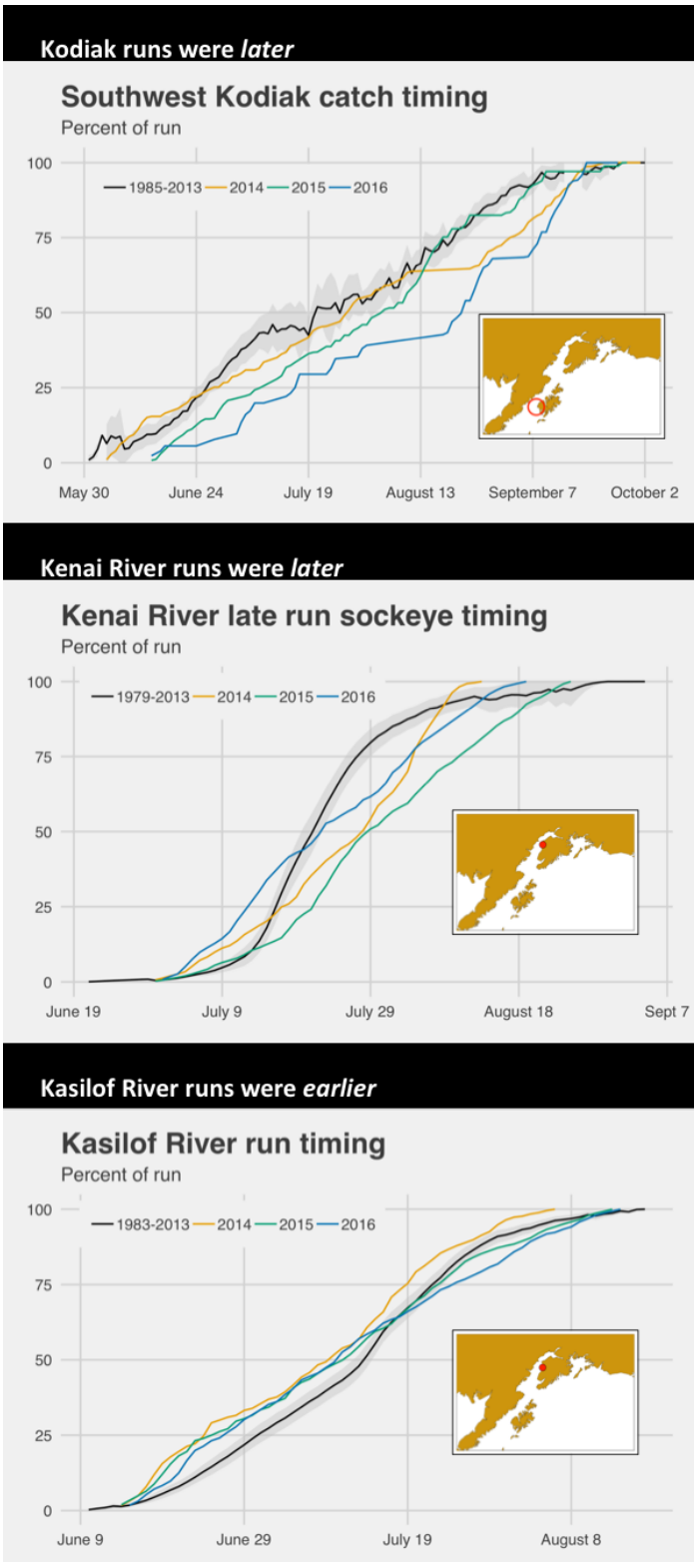

Fig. 4. Run timing of Southwest Kodiak, Kenai River, and Kasilof River sockeye salmon during 2014-2016 compared to long-term means.

Linking Ocean Temperate and Sockeye Run Timing

At-sea migration patterns in salmon remain poorly understood, and no data are available concerning the distribution and timing of Gulf of Alaska sockeye salmon returning to natal rivers during the period of interest. However, extensive records are available for the timing of commercial catches and escapement for important stocks, and these data provide the best available information for understanding recent changes in sockeye migration. Sockeye salmon run timing was estimated for this report with data on both escapement from a variety of Gulf of Alaska runs, as well as commercial catch data from both Upper Cook Inlet and the Kodiak Management Area (details in Data Sources and Methods). Several important sockeye runs showed run timing during 2014-2016 that was highly unusual when compared to long-term means (Fig. 4), suggesting that the unusual climate conditions during these years affected sockeye migration patterns.

In order to formally analyze the relationship between climate conditions and run timing, data were standardized across different long-term time series by calculating the day of the year in which 50% of the total run (catch or escapement) had occurred in each year (Quinn and Adams 1996). A Dynamic Factor Analysis (DFA) model was then used to summarize variability across the many different run timing information sources (Zuur et al. 2003). This DFA model showed evidence of shared variability (positive loadings) for Southwest Kodiak catches and Kasilof and Kenai River escapement. A variety of other data sources had weaker loadings on the shared trend (Fig. 5). The shared trend of variability in run timing showed an increasing trend since the early 2000s, with a further step increase beginning around 2014 (Fig. 6). Positive values in this

shared trend indicate a change towards later runs in time series with positive loadings, and earlier runs in time series with negative loadings.

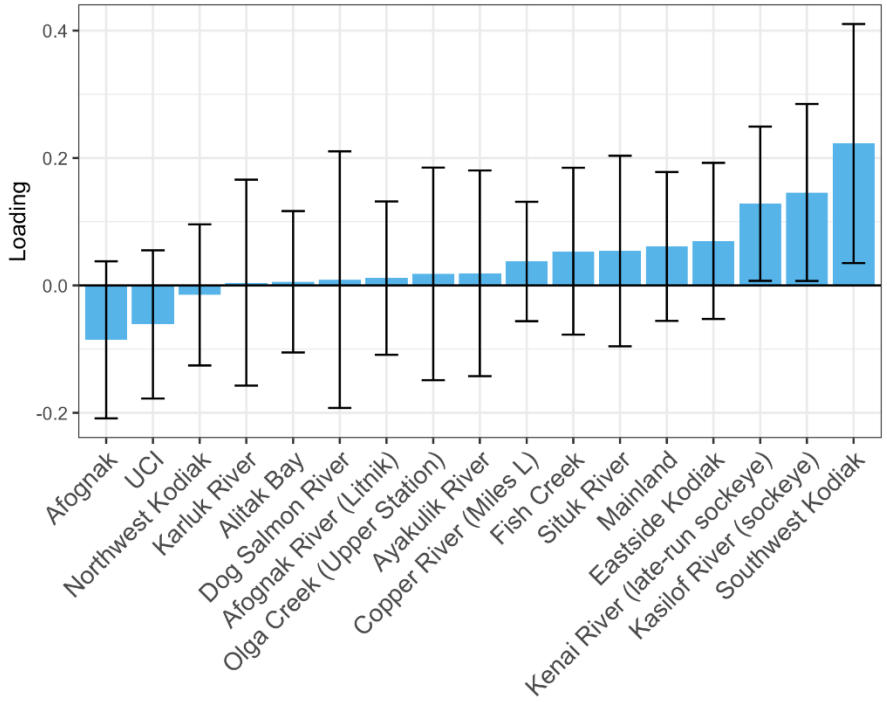

Fig. 5. Dynamic Factor Analysis summary of Gulf of Alaska sockeye salmon run timing, 1978-2019. Loadings on individual escapement and catch time series (day of year when 50% of run has occurred in each year, estimates with 95% confidence intervals). Time series with positive loadings are later when shared trend goes up; time series with negative trends are earlier when the shared trend goes up. UCI = = Upper Cook Inlet total commercial catch.

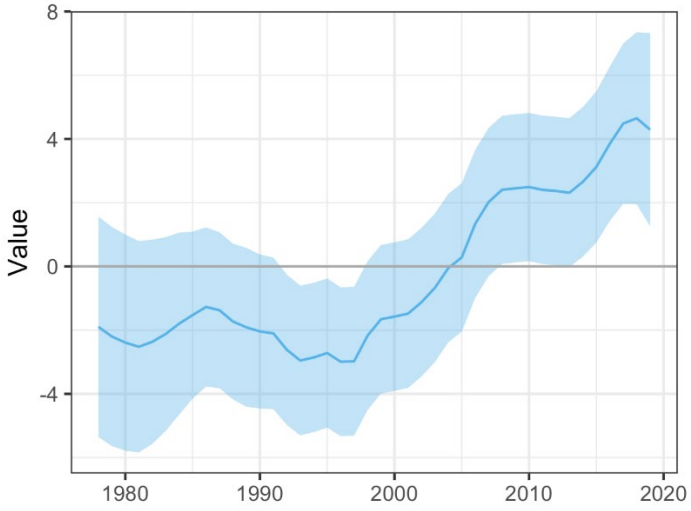

Fig. 6. Shared trend in sockeye run timing (estimate and 95% confidence interval) from DFA model. Value of 0 indicates average overall timing.

A variety of different Gulf of Alaska climate variables may influence sockeye salmon run timing, including sea surface temperature, sea level atmospheric pressure, river temperature, and river flow. A DFA model was again used to summarize variability across these different climate variables. This DFA model summarized overall climate variability as a combination of positive loadings for a range

of air, sea, and river temperature time series, and negative loadings for stream flow in Cooper Creek (Kenai River drainage) and Willow Creek (Susitna River Drainage; Fig. 7). In other words the model captures the tendency for temperatures at different sites to vary together, and for stream flow at those two Southcentral Alaska sites to decline in warm conditions. The shared trend of climate variability from this DFA model clearly shows the transition to extreme conditions since 2014 (Fig. 8).

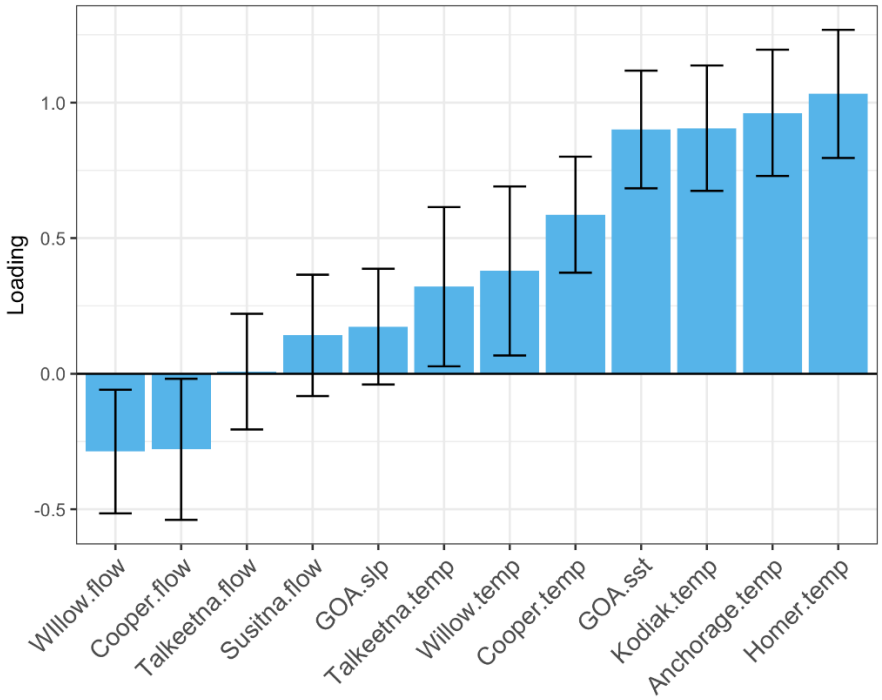

Fig. 7. Dynamic Factor Analysis summary of Gulf of Alaska and South-Central climate, 1978-2019. Loadings on individual climate time series (estimates with 95% confidence intervals). Time series with positive loadings go up when the shared trend goes up; time series with negative trends go down when the shared trend goes up. GOA.slp = Gulf of Alaska sea level atmospheric pressure, GOA.sst = Gulf of Alaska sea surface temperature.

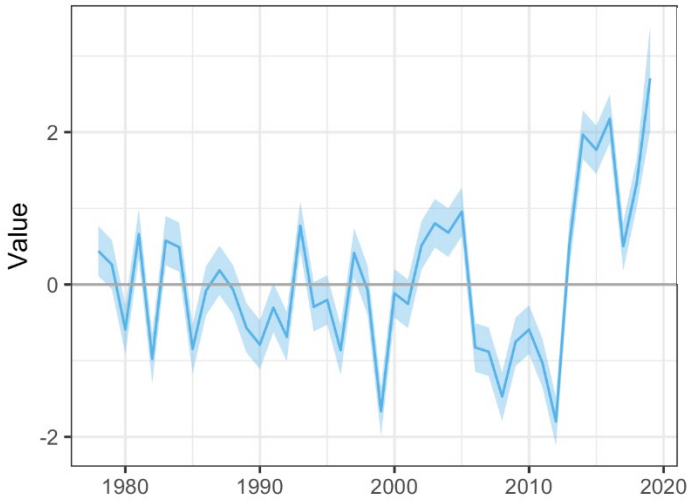

Fig. 8. Shared trend in climate variability (estimate and 95% confidence interval) from DFA model. Value of 0 indicates average conditions.

These results confirm that overall trends in both overall sockeye run timing (Fig. 6) and overall climate conditions for sockeye (Fig. 8) have been at unprecedented levels since 2014. The next step of the analysis is to evaluate the evidence that the two trends are related. An initial examination of possible driver-response relationships with a scatter plot of annual values in the climate trend and the sockeye run timing trend suggests a highly nonlinear relationship, with two distinct clusters of observations in the 1978-2019 time period (Fig. 9). This initial result suggests the possibility of two overlapping mathematical functions describing climate effects on salmon, occupying different parts of the time series. This kind of complex driver-response relationship, sometimes referred to as "alternative stable states" is a common feature of ecosystems experiencing disturbance from external factors such as climate change (Scheffer et al. 2012, Litzow and Hunsicker 2016). *This scatter plot also illustrates the highly unusual nature of the 2014-2016 period for both climate conditions and sockeye run timing: both quantities were at unprecedented levels in 2014-2016.*

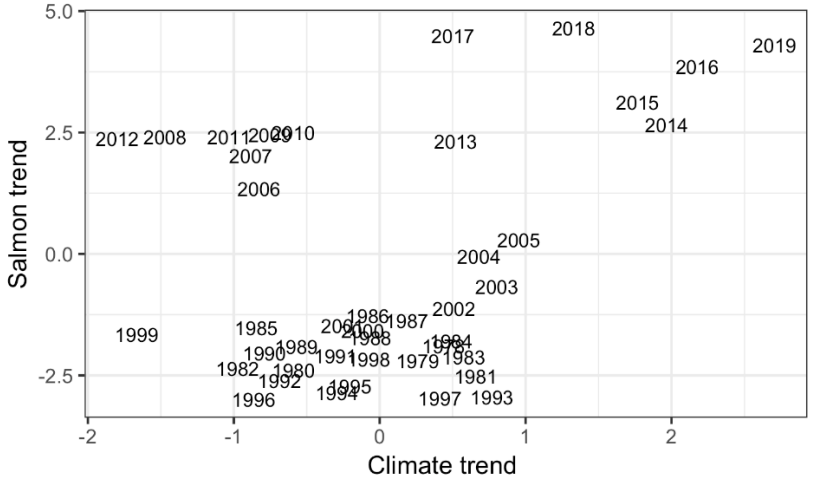

Fig. 9. Time series of climate conditions (shared trend from climate DFA model; driver variable) and sockeye run timing (shared trend from salmon DFA model; response variable).

The next step in this analysis was to test for meaningful relationships between sockeye run timing and climate state. This part of the analysis answers the question of whether there is evidence that run timing is responding to changes in the climate. This analysis used Bayesian linear regression models to determine if the slope of sockeye run timing on the shared climate trend (unit change in run timing per unit change in climate) is different from zero. These models do support the hypothesis of a meaningful relationship between climate state and run timing with an estimated slope that is clearly different from zero. These models also indicate that the relationship is strengthening over time (increasing intercept since the early 2000s (Fig. 10).

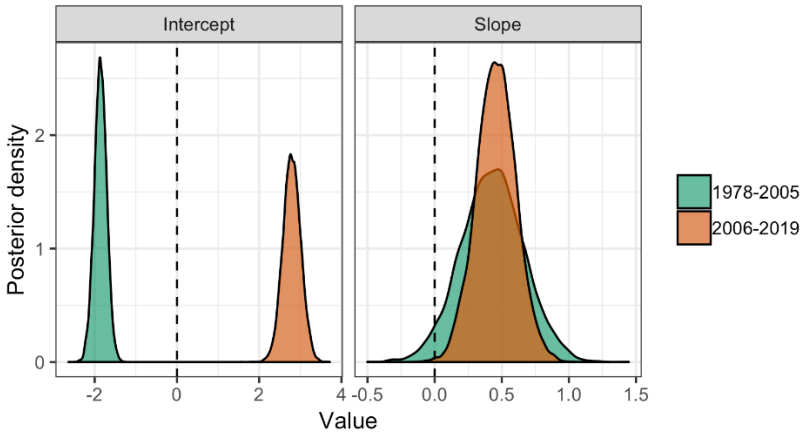

Fig. 10. Era-specific relationships between shared climate trend and shared trend in sockeye salmon run timing: posterior distributions for intercept and slope from Bayesian linear regression fit separately to data from 1978-2005 and 2006-2019.

As noted earlier, this kind of time-dependent driver-response relationship is a common feature of ecosystems experiencing external forcing (Scheffer et al. 2012), especially in instances of changing climate variables (Wolkovich et al. 2014). However, the causes of this kind of complex, nonlinear relationship are typically very difficult to determine, and understanding the apparent jump in sockeye response to climate forcing is beyond the scope of this report. What is apparent is the effect of the simultaneous change in run timing and climate: 2019 was the most extreme year on record for the climate trend, and 2017-2019 were the most unusual years on record for the shared trend in sockeye run timing, with 2014-2016 close behind (Fig. 9). In addition, a sensitivity analysis shows that similar results were obtained when only escapement time series were analyzed, indicating that management changes to catch timing do not explain changing run timing in recent years (results not shown).

Ecosystem Context

In addition to the unusual sockeye run timing noted above, a wide range of ecosystem responses to unusual climate conditions have been noted since 2014 in the Gulf of Alaska. These include the largest-ever observed mass mortality event for common murres and a variety of other chronic seabird mass mortality events; acute and chronic production of neurotoxins by harmful algal blooms (McCabe et al. 2016, Roggatz et al. 2019); significant mortality in humpback whales; unprecedented irruptions of pelagic colonial tunicates (*Pyrosoma* sp.); fisheries failures for Pacific cod and pink salmon; unusual patterns of primary productivity (spring blooms that are unusually early and small; Litzow et al. in prep), and shifts in zooplankton abundance and community structure (Litzow et al. in prep.). Taken together, these responses underscore the unusual nature of both the initial 2014-2016 Warm Blob and subsequent years, and the potential for continuing ecological change as long as the current warming event lasts.

Implications for Management

A very high degree of uncertainty currently attends ecosystem status in the Gulf of Alaska, both for the specific question of sockeye run timing and stock mixing, and for broader questions of stability in the ecosystem and fisheries. While the 2014-2016 return years were highly unusual for sockeye run timing as measured by the shared trend of run timing variability, even these extreme values have been exceeded during 2017-2019 (Fig. 3b). Given that biological responses to ecosystem perturbations such as climate forcing are complex and often lagged in time (Frank et al. 2011, Hughes et al. 2013), and that climate conditions have again returned to levels commensurate with those seen in 2016, the full scope of biological consequences of the current climate event has likely not yet become apparent. *In this situation of rapid change outside the envelope of historical conditions, the ability of data from 2014-2016 to serve as a reliable guide for future conditions is highly questionable.* The speed of change currently occurring in the Gulf of Alaska underscores the caution provided by Shedd et al. (2016) concerning the use of their data in situations materially different from those under which the study took place, and suggests the need for a precautionary approach to possible management changes based on these results.

Data Sources and Methods

Sea surface temperature data were extracted from the NOAA Extended Reconstructed Sea Surface Temperature data set (ncdc.noaa.gov). Sea level pressure data come from the NCEP/NCAR Reanalysis (esrl.noaa.gov). River temperature and river flow data come from the US Geological Survey (waterdata.usgs.gov). Air temperature data come from the Alaska Climate Research Center (climate.gi.alaska.edu). Data on sockeye run timing come both from escapement counts and commercial catch data obtained from ADF&G (adfg.alaska.gov). DFA models were fit following the recommendations of Holmes et al. (2018). Bayesian regression models were fit following the recommendations of Gelman et al. (2014).

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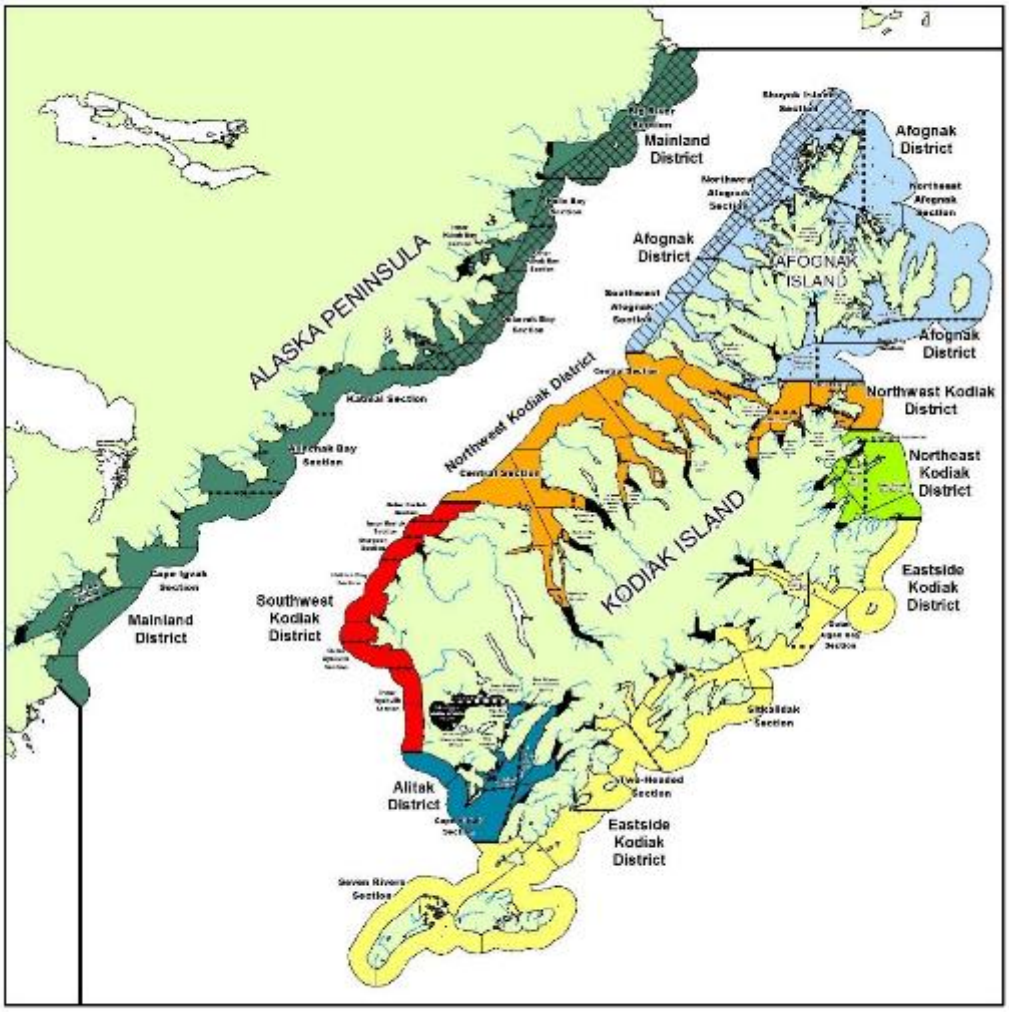
Appendix A – Author's Biographical Statement

Dr. Michael Litzow is a fisheries oceanographer who studies the impacts of climate variability and climate change on commercially important fish stocks in Alaska. He obtained his B.S. in Biological Sciences from the University of Alaska, Fairbanks, his M.S. in Marine Science from the University of California, Santa Cruz, and his Ph.D. in Ocean Sciences from the University of Tasmania, Australia. Dr. Litzow's recent research has focused on the effects of changing ocean climate on Gulf of Alaska salmon stocks. His previous research has involved a variety of taxa, including groundfish, crabs, shrimp, herring, other forage fish, and seabirds, and he is the author of thirty peer-reviewed papers. Dr. Litzow is the owner of Blue World Research, a private consulting firm, and until recently was a research faculty member at the University of Alaska, College of Fisheries and Ocean Sciences.

December 2019



Synthesis of Chinook Salmon Stock Contribution Estimates within the Kodiak Management Area **Commercial Salmon Fisheries (Proposals 63 & 37)**

Kodiak Salmon Work Group

EXECUTIVE SUMMARY

- During all years and sampling periods regardless of the commercial salmon fishery district sampled, British Columbia (hatchery stocks) Chinook salmon dominated the

stock composition of the harvest. Estimates of contribution ranged from a low of 30% to a high of 70% with respective harvests of several hundred to several thousand fish.

- Consistently, contributions from Washington and Oregon Chinook stocks (Western US stocks) to the KMA commercial harvest ranged from 7.3% to 37% and averaged 28%.

- Contributions from Southeast Alaska/North Gulf Coast were in most cases higher than the combined contributions from both Kodiak and Cook Inlet. The estimates generally seemed to be reflective of periods of higher (1997-1999) and lower abundance (2014-2016) for Southeast Alaska stocks.

- The capability of any marine salmon fisheries sampling program to consistently estimate the harvest, in a timely manner, of at most several hundred fish over a commercial fishing season within the geographic scope of the Kodiak Management Area is untenable. Given the current status of both the Kodiak and Cook Inlet Chinook salmon stocks at present, the actions suggested by Proposal 37 are unwarranted.

- It should be noted that for the Cook Inlet stocks harvested within the Kodiak Management Area, a majority are hatchery fish produced for marine or in-river sport fisheries.

- The Chinook salmon stocks contributing to the Kodiak Management Area commercial fishery are similar to those contributing to most of the marine commercial and recreational fisheries from Yakutat to Adak, or coastwide.

INTRODUCTION

The Kodiak Management Area and the associated salmon fisheries has a long and storied history of sustainable fisheries management success. A foundational feature for this success is the escapement enumeration program using weirs and counting individual fish as they migrate upstream. This program has largely been in place since the early 1900s with weirs operated annually on the Karluk, Ayakulik and Frazer lake systems. Daily and cumulative escapement counts are relayed to the area management office for each system and when combined with other sources of data: harvests, aerial survey index counts (for systems without weirs), fishing effort along with additional biological data (timing, migration patterns, age composition) are all sourced into fishery management decisions and emergency orders to open or close districts, sections and subsections of fishing areas throughout the salmon fishing season. An additional vital feature of this program is the inclusion of enclosures or “traps” that allow for live sampling of the escapement, specifically for sockeye and Chinook salmon and the collection of biological attribute data (age, sex, length) which is imperative for building brood tables which in turn are employed for establishing and evaluating biological escapement goals and generating pre-season forecasts.

An additional prominent feature of the Kodiak Management Area salmon fisheries are the 7 management plans which guide management of the salmon stocks and species during the salmon

fishing season which commences in early to mid-June and extends into late September. The management planning process was largely initiated in the mid to late 1970s which was a period of extremely poor salmon production throughout the entire Kodiak Archipelago and was cause for multiple years of limited commercial fishing by all gear groups with the overall objective of rebuilding wild salmon stocks. These management plans were the result of extensive efforts by ADF&G management and research biologists, commercial fishermen, the local fish and game advisory committee and ultimately the Alaska Board of Fisheries over multiple triannual meetings (Malloy, 1988).

Description of Kodiak Chinook Salmon Fishery

The Kodiak Island area has two wild chinook salmon stocks (Karluk and Ayakulik Rivers) and one introduced run which originates in the Dog Salmon River. There have also been several hatchery produced chinook release sites permitted that promote road accessible shore/boat recreational fisheries. The commercial seine and set gillnet fisheries harvest Chinook salmon incidentally while targeting local sockeye, chum and pink salmon stocks along nearshore migration pathways. The harvests typically occur during June and July and at times the harvests can consist of immature or feeder Chinook that are traversing well established commercial fishing areas in the Westside, Southwest and Alitak Districts. The record commercial harvest of 42,000 fish in 1993 consisted of large numbers of immature/feeder kings and stimulated concern from the recreational sector within the Cook Inlet area that large numbers of the harvested fish were of Cook Inlet origin. The harvest during 1993 was almost twice the previous high estimate of 24,000 fish, which occurred in 1992. As a back drop to this concern, several chinook salmon stocks within Cook Inlet were experiencing poor production (Deshka and Early Run Kenai R.) while simultaneously there was a serge in production from stocks originating in British Columbia, Washington and Oregon which were largely of hatchery origin; a portion of these hatchery fish were marked with a coded wire tag and missing the adipose fin (Swanton, 1997). There are several hatchery stocks in Cook Inlet that were marked and could thereby serve for detecting the presence of these stocks in the Kodiak Fishery. A pilot commercial catch sampling program was initiated in 1994 (Swanton 1997) and was followed by a focused interdivisional sampling and harvest estimation program for the years 1997-1999 (Clark and Nelson 2001). A more contemporary and comprehensive genetic stock identification (GSI) program was conducted for the years 2014-2016 and generally corroborated previous results (Shedd et al. 2016).

North American Chinook salmon Ocean Migrations

There are literally hundreds of Chinook Salmon stocks spanning the Coastline from Oregon, Washington, British Columbia and throughout Alaska from Southeast and along the Alaska Peninsula; these stocks are often referenced as far north migrating stocks, as opposed to stocks that have more localized or truncated ocean migrations. With the advent of Coded Wire Tagging (early 1970s) coupled with extensive High Seas Tagging (conducted throughout the North Pacific) and scale pattern analyses efforts conducted by the University of Washington much insight was gleaned regarding migration patterns along coastal and open ocean migration routes. Substantial increases in hatchery production of Chinook salmon in Oregon, Washington and British Columbia occurred in the early 1990s which resulted in a surge in coastwide abundance. Much of the increased hatchery production was in response to poor production from wild stocks, compensation for habitat destruction, tribal agreements, hydroelectric dam impacts or mitigation owing to wild stock endangered species act (ESA) listings.

Coastwide abundance of feeding/rearing Chinook increased markedly and harvests of Chinook increased both within Alaska's commercial and recreational coastal marine fisheries as well as bycatch of chinook in federal fisheries operating in the Gulf of Alaska. The Pacific Salmon Treaty between the United States and Canada governs harvests of these stocks throughout Southeast Alaska (Ketchikan to Yakutat) where jurisdiction between the parties ends. The harvest of these stocks throughout the remainder of the Gulf of Alaska is viewed with recognition that they originate in other states or British Columbia and harvest should be limited or constrained where appropriate. This has been the policy direction followed by both ADF&G and the Alaska Board of Fisheries certainly within the last 10-15 years and pertains to Kodiak, Kachemak Bay and Homer spring and winter recreational fisheries and both commercial and recreational fisheries prosecuted in Prince William Sound.

Data Summaries by Year

(Swanton, 1997) Caution is suggested relative to these estimates owing to low marking fractions and less than optimum temporal and spatial sampling coverage**.**

1994

The two Kodiak commercial fishing areas where CWT sampling occurred (Westside and Alitak Districts) experienced a commercial harvest of 5,089 Chinook salmon (80% CI 2,927-7,253 fish) from marked cohorts which represented 32.5% of the sampled harvest. The stock groupings represented by the tag recoveries were: 9.7% Southeast Alaska; 83% from British Columbia; 4.9% from Washington state and 2.4% from Oregon.

From the Westside Kodiak area most of the marked cohorts were of British Columbia origin with marked fish from Southeast Alaska, Washington and Oregon also detected in lower numbers. There was an apparent temporal change in stock contribution from the week of June 12-18 which were more varied, as compared to the period June 19-25 when only British Columbia and Southeast Alaska stocks were detected. The marked cohort contribution estimates for this area spanning 12 June through 30 July was 4,655 fish (80% CI 2,517-6,793 fish) from a total catch of 14,619 fish or 31.8%.

Within the Alitak Bay District all marked fish recoveries were of British Columbia origin and represented 435 Chinook out of a total catch of 640 fish. This represented 68% of the catch during the period off sampling.

(Clark and Nelson 2001)

1997

During the 1997 Kodiak commercial salmon fishing season there were 18,728 Chinook salmon harvested with 89% of the harvest occurring during the CWT sampling period of 9 June-8 August; a majority 67% of this harvest (about 11,000 fish) took place within the Westside area. The study plan designated a sampling fraction of inspecting 20% of the observed catch for CWT's which is consistent with Coastwide sampling programs sanctioned by the Pacific Salmon Commission.

The number of Chinook salmon inspected for a missing adipose fin in1997 was 6,015 or 36% of the harvest during the sampling period; 37% of the harvest was inspected within the Westside District catch; 60% within the Alitak Bay District; sampling within the Eastside District exceeded 20% and an additional 24% (792 fish) were inspected from harvests within the Mainland fishing District.

The general stock composition from the sampled harvest was: 13% from Alaska stocks, 72% from British Columbia, 7% from Washington and 8% from Oregon Chinook stocks. The 18 tag recoveries from Alaska stocks was further broken down to include 11 recoveries from Cook Inlet: two Kenai River, three Ship Creek, three Ninilchik River, one from Deception Cr., one from Crooked R. and one from Homer Spit.

1998

In 1998 there were 17,341 Chinook harvested commercially during the sampling period 9 June-8 August with approximately 93% occurring within the Westside (including the Southwest Afognak Section and Northwest Kodiak District), Alitak Bay and Eastside Kodiak Districts. There was 53% of this harvest sampled: 45% in the Westside District, 50% in the Alitak District and 43% within the Eastside District. No samples were collected from the Mainland District as the overall catch was 393 fish.

The identified tagged fish were represented as follows: 31% (79) were Alaska stocks; 49% (125) were from British Columbia; 15% from Washington and 5% from Oregon. The Alaskan stocks originating in Cook Inlet (46 tag recoveries) were three from Resurrection Bay; 5 from Seldovia Harbor; 10 from Homer Spit; 5 from Halibut Cove; 6 from Ninilchik R., 13 from Deception Cr., one from Crooked Cr. and two from the Kenai R. The additional Alaskan stock recoveries were 9 from Southeast Alaska and 24 from the Buskin River.

1999

During the 1999 commercial salmon fishery there were 18,299 Chinook harvested which represented 94% of the harvest that occurred during the June 9-August 8 sampling time frame. About three quarters (73%) of the harvest was realized within the aforementioned fishing areas, and similar to previous years, a majority of the harvest was realized within the Westside Kodiak District. There was 46% of the harvest (7,940 fish) inspected for CWT via a missing adipose fin. Similar to the previous years 45% of the catch was from the Westside District, 41% of the Alitak Bay District. No sampling results were reported for the Eastside District, however 12% of the Mainland District (356 fish) harvest was opportunistically sampled.

There were 201 tag recoveries from the 1999 sampling effort, 124 were from the Westside Kodiak District, 10 from the Mainland District, 20 from the Eastside and three from the Alitak Bay District. There were 32% (64 tagged fish recovered) from Alaska stocks, 31% from British Columbia, 13% from Washington and 24% that originated from Oregon. There were 21 tagged fish recovered that originated from Cook Inlet stocks with distribution by area similar to 1998. The authors after consulting with fishery management staff, suggested that if any non-local stock or stock grouping was estimated to have a 10-15% exploitation rate (harvest rate applied over the entire brood year) imposed by fisheries within the Kodiak Management Area that this would be cause for concern. In addressing this, Clark and Nelson (2001) stated " Therefore, publication of imprecise, but consistently small harvests of Cook Inlet hatchery cohorts in the KMA fishery provided the best indication of the lack of importance of the KMA fishery in influencing production of chinook salmon bound for Cook Inlet."

(Shedd et al. 2016)

This study employed genetic stock identification techniques to generate stock contribution estimates for chinook salmon harvested within both the commercial and recreational fisheries throughout the Westward Region (Kodiak, Chignik and the Alaska Peninsula Management areas). The information summarized below is only for the commercial fishery within the Kodiak

Management Area to maintain consistency in comparing other information presented within this summary. This study focused on 4 Districts/reporting areas and two temporal strata (Early: 1 June-5 July; Late: 6 July-5 August).

2014

Overall, there were 8,382 fish commercially harvested of which 3,050 fish were sampled (sampling fraction of 36.4%) for all areas and time strata. The results of GSI for the entire time and area strata were: 55.6% British Columbia, 34% West Coast US (Washington and Oregon stocks combined), 3.4% Southeast Alaska and Northeast Gulf of Alaska stocks(Southeast Alaska/Gulf Coast, 2.6% Cook Inlet, 1.9% Kodiak and 1.6% referred to as the Eastern Bering Sea stock grouping. The following are the aggregate stock composition estimates broken down by geographical and temporal strata:

Northwest Kodiak District and Afognak(Statistical Areas: 251, 253 and 254)

- Early (1 June-July 5) 72.1% British Columbia stocks, 15.7% West Coast US, 4.3% Kodiak, 2.7% Cook Inlet and 2.4% Southeast Alaska/North Gulf Coast Alaska.
- Late (July 6-August 5) 56.0% British Columbia stocks, 34.7% West Coast US, 4.6% Southeast Alaska/Gulf Coast, 2.2% Cook Inlet and 1.2% Kodiak Stocks.

Eastside Kodiak and Afognak District (Statistical Areas: 258, 259 and 252)

- Early (1 June-July 5): 51.2% British Columbia Chinook stocks, 35.3% West Coast US, 4.2% Southeast Alaska/Gulf Coast, 0.3% Cook Inlet and 4.2% Kodiak stocks.
- Late (July 6- August 5):51.7% British Columbia stocks, 37.5% West Coast US, 2.6% Southeast Alaska/Gulf Coast, 4.0% Cook Inlet and 0.1% Kodiak Chinook salmon stocks.

Southwest Kodiak Alitak Districts (Statistical Areas: 255, 256 and 257)

- Early (June 1-July 5): 51.2% British Columbia stocks, 30.8% West Coast US, 6.1% Southeast Alaska and Gulf Coast, 1.1 % Cook Inlet and 10.0% Kodiak Stocks.
- Late (July 6-August 5): 54.5% British Columbia, 39.0% West Coast US, 2.9% Southeast Alaska/Gulf Coast, 1.4% Cook Inlet and 1.0% Kodiak stocks.

Mainland District (Statistical Area 262) There was no sampling conducted for the "Early" strata during 2014.

- Late: July 6-August 5): 51.2% British Columbia Stocks, 39.5% West Coast US stocks, 4.8% Southeast Alaska/Gulf Coast, 1.5% Cook Inlet and 0.9% Kodiak stocks.

2015

During 2015 the Chinook harvest was 8,087 of which 2,775 fish were sampled resulting in a 34% sampling fraction. The estimated stock contributions for this commercial fishing season were: 51.6% British Columbia, 33.9% West Coast US, 4.9% Southeast Alaska/Gulf Coast, 4.5% Cook Inlet and 4.5% Kodiak.

Northwest Kodiak District and Afognak(Statistical Areas: 251, 253 and 254)

- Early (June 1-July 5): 54.8% British Columbia, 24.3% West Coast US, 8.5% Southeast Alaska/Gulf Coast, 6.4% Cook Inlet and 4.5% Kodiak.
- Late (July 6-August 5):52.1% British Columbia, 34.9% West Coast US, 4.9% Southeast Alaska and Gulf Coast, 4.3% Cook Inlet and 3.2% Kodiak.

Eastside Kodiak and Afognak District (Statistical Areas: 258, 259 and 252)

- Early (June 1-July 5):36.4% British Columbia stocks, 46.8 West Coast US stocks, 4.8% Southeast Alaska and Gulf Coast stocks, 7.8% Cook Inlet and 3.1% Kodiak Chinook Stocks.
- Late (July 6-August 5):49.4% British Columbia stocks, 40.7 West Coast US stocks, 3.5% Southeast Alaska and Gulf Coast, 1.3% Cook Inlet and 4.3% Kodiak Chinook stocks.

Southwest Kodiak and Alitak Districts (Statistical Areas: 255, 256 and 257)

- Early (June 1- July 5): 33.8% British Columbia stocks, 35.2% West Coast US, 3.2% Southeast Alaska/Gulf Coast stocks, 2.5% Cook Inlet and 24.9% Kodiak Stocks.
- Late (July 6-August 5):63.1% British Columbia stocks, 30.3% West Coast US, 3.4% Southeast Alaska and Gulf Coast stocks, 1.4% Cook Inlet and 1.2% Kodiak Chinook stock contributions.

Mainland District (Statistical Area 262) Similar to 2014, there was no sampling conducted during 2015 within the period June 1- July 5 for this district.

- Late (July 6-August 5): 64% British Columbia stocks, 19.6% West Coast US, 3.0% Southeast Alaska/Gulf Coast, 12.8% Cook Inlet stocks and no contribution from Kodiak Chinook stocks.

2016

The harvest during 2016 was only 7,471 Chinook of which 3,189 fish were sampled, which represented a 43% sampling fraction. The various stock contributions to the commercial harvest for 2016 were: 56.5% British Columbia, 30.6% West Coast US, 6.2% Southeast Alaska/Gulf Coast, 3.8% Cook Inlet and 1.3% Kodiak stocks.

Northwest Kodiak District and Afognak (Statistical Areas: 251, 253 and 254)

- Early (June 1-July 5): 59.6% British Columbia stocks, 15.0% West Coast US, 12.7% Southeast Alaska and Gulf Coast, 7.8% Cook Inlet and 3.2% Kodiak stocks.
- Late (July 6-August 5):61.8% British Columbia stocks, 17.3% West Coast US, 11.5% Southeast Alaska and Gulf Coast, 6.7% Cook Inlet stocks and 1.6% Kodiak stocks.

Eastside Kodiak and Afognak District (Statistical Areas: 258, 259 and 252)

- Early (June 1- July 5): 57% British Columbia stocks, 27.4% West Coast US Chinook stocks, 6.4% Southeast Alaska/Gulf Coast, 2.3% Cook Inlet and 2.6% Kodiak stocks.
- Late (July 6-August 5):51.5% British Columbia Chinook stocks, 39.5% West Coast US stocks, 1.3% Southeast Alaska/Gulf Coast stocks, 3.8% Cook Inlet and 2.8% Kodiak stocks.

Southwest Kodiak and Alitak Districts (Statistical Areas: 255, 256 and 257)

- Early (June 1-July 5): 67.1% British Columbia, 24.6% West Coast US stocks, 3.1% Southeast Alaska/Gulf Coast, 1.4% Cook Inlet and 2.9% Kodiak stocks.
- Late (July 6-August 5): 69.2% British Columbia stocks, 24.7% West Coast US, 1.8% Southeast Alaska, 2.5% Cook Inlet stocks and 1.1% Kodiak Chinook stocks.

Mainland District (Statistical Area 262)

- Early (June 1-July 5): 46.6% British Columbia stocks, 44.1% West Coast US, 3.6% Southeast Alaska and Gulf Coast, 1.9% Cook Inlet and 0.3% Kodiak stocks.

- Late (July 6-August 5):54.1% British Columbia Chinook stocks, 37.1% West Coast US, 5.1% Southeast Alaska and Gulf Coast, 2.5% Cook Inlet and no contribution from Kodiak Chinook stocks to the harvest.

A direct comparison of the presented information and contribution estimates to the KMA Chinook harvest is difficult because of specific requirements related to CWT estimates and those generated using GSI. For generating reliable harvest estimates using CWT data, a large marking fraction (number of fish marked/total released) combined with a recommended 20% sampling fraction (number of fish sampled from the total catch) is statistically necessary. In the case of both the Kodiak and Cook Inlet Chinook stocks for the years 1994 and 1997-1999, the number of marked fish from the various hatchery releases was small and when combined with low numbers of recoveries, the harvest estimates were uncertain or informative at best. For these reasons, the comparisons of the CWT contributions with those generated using GSI are completed using a simple percent contribution to the overall sampled harvest (Table 1). In reviewing the data, the overall stock contributions are reasonably consistent: British Columbia stocks consistently contribute greater than 50% to the sampled harvest, followed by Washington and Oregon stocks and to a lesser extent Southeast Alaska with minor contributions from either Kodiak or Cook Inlet stocks.

Summary and Recommendations

- During all years and sampling periods regardless of the commercial salmon fishery district sampled, British Columbia Chinook salmon stocks dominated the stock composition of the harvest. Estimates of the percent contribution ranged from a low of 30% to a high of 70%, representing harvests of several hundred to several thousand fish.

- Consistently, contributions from stocks originating in Washington and Oregon (Western US stocks) to the commercial harvests ranged from a low of 7.3% to a high of 37% and averaged 28% of the estimated harvest.

- Contributions from Southeast Alaska/North Gulf Coast were in most cases higher than the combined contributions from both Kodiak and Cook Inlet. These contributions also seem to be reflective of periods of higher and lower abundance when comparing contributions from 1997-1999 (higher abundance) to those from 2014-2016 which was a period of lower Southeast Alaska stock abundance.

- The capability of any marine salmon fisheries sampling program to consistently estimate the harvest in a timely manner, of at most several hundred fish over a commercial fishing season within the geographic scope of the Kodiak Management Area, is untenable.

- Given the stock status of both the Kodiak and Cook Inlet Chinook salmon stocks a regime such as that outlined in Proposal 37 is unwarranted. Both the Kodiak (0%-4.5%) and Cook Inlet (2.6%-4.5%) stock contributions to the Chinook harvest are minor.

- It should be noted that for the Cook Inlet stocks harvested within the Kodiak Management area, a majority are hatchery fish produced for marine or in river sport fisheries. A specific brood stock selection (similar life history and migration traits to the wild stock) and marking program are required for a hatchery stock to be employed as a proxy for wild stocks, therefore the Cook Inlet tag recoveries and rates should not be applied to Cook Inlet wild Chinook salmon stocks.

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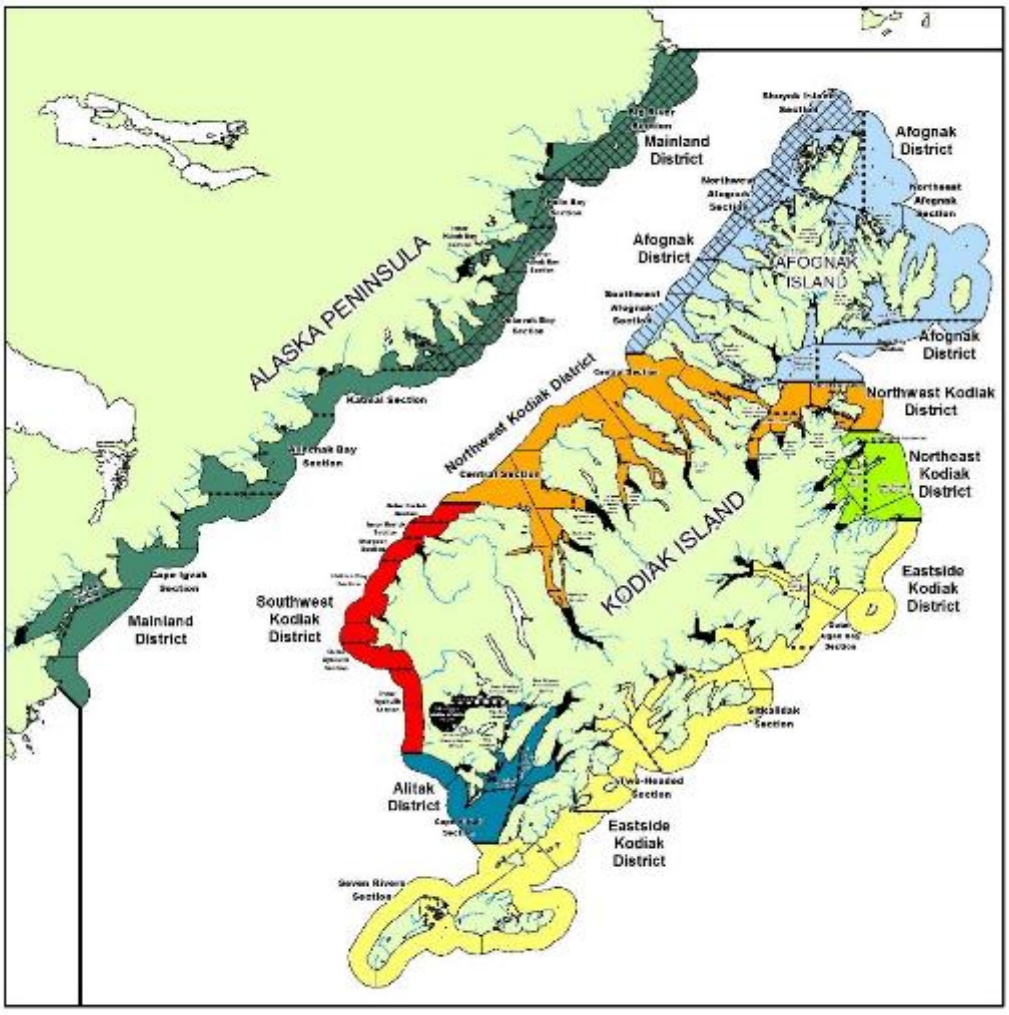
Table 1. Summary of Chinook Stock Group Harvest Percentages in the Kodiak Management Area.

	Calendar Year						
	1994	1997	1998	1999	2014	2015	2016
Sample size	5,089	6,015	9,191	7,940	3,050	2,775	3,189
Stock Group							
British Columbia	83%	72%	49%	31%	56%	52%	57%
Washington &Oregon	7%	15%	20%	37%	34%	34%	31%
SE Alaska/Gulf Coast	10%	13%	31%	32%	3%	5%	6%
Cook Inlet	0%	present[1]	present[1]	present[1]	2%	2%	4%
Kodiak	0%	n/a[2]	n/a[2]	n/a[2]	1%	1%	1%

[1] CWTs were recovered however insufficient totals to estimate a harvest proportion

[2] no CWTs recovered from fishery sampling

December 2019



An

Overview and Contrast of Management Plans and Harvests of Sockeye Salmon Destined for Upper Cook Inlet, 2014-2016.

By the Kodiak Salmon Work Group

The following is germane to addressing **Alaska Board of Fisheries Proposals 64, 65 and 66** which seek to severely curtail fishing time within traditional Kodiak Management Area (KMA) districts because of identified harvests of Upper Cook Inlet (UCI) sockeye salmon during the years 2014-2016.

EXECUTIVE SUMMARY

- The complexity within the existing UCI salmon management plans guiding management of the numerous fisheries far exceeds the quality, quantity and timeliness of the information available.

- Harvest estimates have far less uncertainty than do the variety of in season run strength projections and numerous escapement monitoring programs, especially the Susitna River escapement component.

- The Off-shore Test Fishery (OTF) run projections have errors around the estimates which are alarming (over projecting the actual run by 60%) given the reliance on this in-season tool within several prominent UCI management plans.

- Any proposed regulatory change to long established salmon fishery management plans must be able to demonstrate a measurable benefit; given poor data quality for specific UCI escapements or for certain in river run projections (Kenai R.), the information system currently in place is incapable of this task.

- When considering a system like the Susitna River, including the longstanding documented problems with estimating escapements, it is not prudent to affect adjacent management areas (e.g., Kodiak) with unnecessary changes.

- Considering the focus on coho salmon within the last three UCI board meetings (2011, 2014, 2017) and the conservative stipulations within the Northern District Management plan, if all of the sockeye incidentally caught in Kodiak were inserted into the UCI fishery mix, it would not have resulted in any benefit to Northern District coho stocks nor in-river users.

- Evaluating the commercial harvest of UCI stocks using a harvest rate metric would not be appropriate because of the uncertainty surrounding the escapement estimates of the Susitna River, Yentna River and other unassessed sockeye stocks.

Introduction

The identification and sporadic estimation of non-local stocks of sockeye salmon contributing to the sockeye harvest within the Kodiak Management Area has been completed using a variety of quantitative (scale pattern analyses and Genetic Stock Identification) and less quantitative (average weight and age proportions) techniques over the last 30 years. There does not appear to be temporal or spatial patterns or abundance-based trends of the contributing stocks, which suggests that the contributions are more random in nature (influenced more by environmental conditions: current, sea surface temperatures or broad scale climatic conditions). A common

acceptance is that fishing time in the various areas surrounding the Kodiak Archipelago targeting local stocks of sockeye, pink and chum salmon also contribute to these events. In a variety of ways one can characterize the Kodiak salmon fishery as a pass-through type fishery and the Upper Cook Inlet salmon fishery more of a gauntlet, where fish traverse through a variety of fisheries and gear types before reaching their natal streams or rivers.

Kodiak Fisheries Management plans

Area description

The Kodiak management area (KMA) includes all inland and marine waters (inside of 3 miles) south of Cape Douglas to Kilokak Rocks on the Alaska Peninsula and includes all islands within the Kodiak Archipelago. Within the area are 7 districts and 52 sections along with numerous subsections and terminal closed water areas. There are approximately 800 streams identified that have supported salmon spawning or rearing (Anadromous Waters Catalog), of which about 440 streams have been referenced as supporting measurable salmon production on an annual or biannual basis. Of the 440 systems, all support pink salmon, about 150 support chum salmon, 39 support sockeye salmon and about 175 support coho salmon populations (Clark et al. 2000). There are 593 Commercial Fisheries Entry Commission (CFEC) limited entry permits issued for the Kodiak area: 375 purse seine; 188 set gillnet; and 30 beach seine. Activity for each gear type fluctuates by year, with participation statistics for 2019 including 176 purse seine, 3 beach seine, and 148 set net permits having made at least one landing during the season.

Fishery Description

The Kodiak salmon fishery can be best described as a pass-through fishery, similar to Southeast Alaska fisheries. Pass through fisheries allow fish to reach terminal areas on their way to natal streams, where any type of fishery conducted is called a terminal fishery. Gear types participating in a pass-through fishery include set gillnet (fixed gear) and purse seine (mobile), which capture fish along their nearshore migration routes. Over time, and with the vigilance of salmon area management staff, fishing patterns, harvest magnitudes, and timing can be qualified and quantified with the goal of building information relative to run strength and migration timing by species and in many cases by specific stocks that contribute to the catch. The overall key to success of this salmon fishery management system is having specific, fixed geographic reference points, long standing accurate catch or harvest accounting, and an escapement enumeration and monitoring program for the major sockeye salmon producing systems that is conducted annually.

Management Plans

There are currently 10 salmon fishery management plans codified in regulation which prescribe how salmon fishing in each of the various districts, patterned after salmon species timing and historical fishing patterns, will be accorded. Two plans, including the Cape Igvak salmon management plan (effective prior to 1985; 5 AAC 18.360; Chignik Bound Sockeye) and the North Shelikof Strait Sockeye salmon management plan (effective 1990; 5 AAC 18.363: Upper Cook Inlet bound Sockeye), are tailored around sockeye salmon stocks destined for adjacent management areas (Chignik and Cook Inlet). The North Shelikof Strait plan was codified in 1990 following an out of cycle board of fisheries meeting that was specifically scheduled to address the unusual harvest of Cook Inlet Bound sockeye that occurred during 1988.

The remaining plans (Alitak District, Westside District, Eastside Afognak, Eastside, North Afognak/Shuyak Island and Mainland District) have been and are tailored towards meeting escapement objectives for each species using run timing and historical commercial fishing patterns, gear and areas. Other management tools include the use of subsections and a variety of

closed water areas around spawning streams (expanded or contracted) based on harvest numbers, aerial survey indices of abundance, and observed build ups of pre-spawning fish in marine staging areas. A multitude of fishery dependent and independent information is typically integrated into the inseason fishery management decision making process and in some cases these are daily decisions. As noted elsewhere, many of these management plans or the management philosophy contained within has been in existence since the late 1970s, and were systematically codified after numerous discussions within ADF&G and with commercial fishermen, processors, advisory committees, and finally with the Alaska Board of Fisheries during regularly scheduled meetings.

Upper Cook Inlet Fisheries Management Plans

Area Description

The Upper Cook Inlet (UCI) commercial salmon fishery management area comprises inland and marine waters of Cook Inlet north of Anchor Point Light. The area includes two districts (Central and Northern) with the Central District being 75 miles in length, 32 miles in width and divided into 6 subdistricts. The contemporary commercial fishing gear types allowed within the UCI are drift and set gillnet. There are approximately 1,300 commercial fishery entry permits within the UCI area, of which 570 are drift gillnet. Depending on a number of factors, the number of drift permit holders making landings in any given year ranges from 396-539 permits, which includes secondary permit holders operating in dual permit fishing operations (Farrington 2014). There are about 745 set gillnet permits issued for the area with about 500 permits making landings within any given year. Approximately 40-60 set gillnet permit holders are active within the Northern District set gillnet fishery.

Salmon fisheries management plans

There are 17 different plans that cover salmon fishing activities either directly or indirectly within the Upper Cook Inlet management area. Of the 17 plans, one deals with invasive northern pike within the Kenai R., two deal with riparian habitat protections; several govern subsistence (state or federal) fishing activities, and one that is novel to Cook Inlet: the personal use fishery management plan which is germane to fishing for sockeye salmon primarily on the Kenai and Kasilof Rivers. Graphical depictions of these complex and interdependent management plans are described during the 2008, 2011, 2014 and 2017 Alaska Board of Fisheries meetings, and can be found at the Board Support section of the ADF&G web page under the Board of Fisheries heading: www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.meetinginfo

Fishing Periods

In the Northern and Central Districts set gillnet fishery, two weekly 12 hour fishing periods are permitted on Mondays and Thursdays; in the drift gillnet fishery salmon may be taken within two weekly 12 hour fishing periods also on Mondays and Thursdays.

Central District Drift Gillnet Fishery Management Plan (5 AAC 21.353)

The stated purpose of this plan is to ensure adequate escapement into the Northern District drainages and offer management guidance to the department. The Board of Fisheries directs management of the drift fleet to minimize harvest of Northern District and Kenai River coho salmon, to provide sport and guided sport fishermen a reasonable opportunity to harvest these salmon stocks over the entire run, as measured by the frequency of in-river restrictions. In order to accomplish this task, from July 9-15 during the first and second regular fishing periods, drift fishing is restricted to the Expanded Kenai and Expanded Kasilof sections of the Upper Subdistrict and Drift Gillnet area 1. At run strengths greater than 2.3 million sockeye salmon to

the Kenai River, the commissioner may by emergency order open one additional 12 hour fishing period within the Expanded Kenai and Expanded Kasilof Sections of the Upper Subdistrict and Drift Gillnet Area 1; additional fishing time is only allowed in the Expanded Kenai and Expanded Kasilof Subsections of the Upper Subdistrict. From July 16-31 at Kenai River sockeye run strengths of less than 2.3 million, fishing during all regularly scheduled fishing periods will be restricted to the Expanded Kenai and Expanded Kasilof Sections of the Upper Subdistrict; at run strengths of 2.3-4.6 million sockeye salmon to the Kenai River, fishing during one regular 12 hr. fishing period will be restricted to one or more of the following sections or areas:… At run strengths greater than 4.6 million sockeye salmon to the Kenai River, one regular 12 hour fishing period per week will be restricted to the Expanded Kenai, Kasilof and Anchor Point Sections. From August 1-15, there are no mandatory area restrictions to the regular fishing periods with several caveats related to coho salmon destined for the Kenai River (see 5 AAC 21.353; p.347).

Northern District Salmon Management Plan (5 AAC 21.358)

The purpose of the Northern District Salmon management plan is to minimize harvests of coho salmon bound for the Norther District of UCI and to provide the department direction for management of salmon stocks. The department shall manage the chum, pink and sockeye salmon stocks primarily for commercial uses, to provide commercial fishermen with an economic yield from the harvest of these salmon resources based on abundance. The department shall also manage the chum, pink and sockeye salmon stocks to minimize the harvest of Northern District coho salmon, to provide sport and guided sport fishermen a reasonable opportunity to harvest these salmon resources over the entire run, as measured by the frequency of inriver restrictions. The department shall manage the Northern District commercial salmon fisheries based on the abundance of sockeye salmon counted through the weirs on Larson, Chelatna, and Judd Lakes or other salmon abundance indices as the department deems appropriate.

Kenai River Late-Run Sockeye Salmon Management Plan (5 AAC 21.360)

The department shall manage the Kenai River late-run sockeye stocks primarily for commercial uses based on abundance. The department shall also manage the commercial fisheries to minimize the harvest of Northern District coho, late-run Kenai king and coho salmon stocks to provide personal use, sport, and guided sport fishermen with a reasonable harvest opportunity.. The Kenai River late-run sockeye salmon commercial, sport and personal use fisheries shall be managed to meet an optimum escapement goal (OEG) range of 700,000-1,400,000 late-run sockeye salmon, achieve in-river goals as established by the board and measured at the Kenai River sonar counter located at river mile 19, and distribute the escapement evenly within the OEG range, in proportion to the size of the run.

Based on preseason forecasts and in-season evaluations of the total Kenai River late-run sockeye return during the fishing season, the run will be managed according to different run strength levels. At run strengths of less than 2,300,000 sockeye salmon, the department shall manage for an inriver goal range of 900,000-1,100,000 sockeye salmon past the sonar counter at river mile 19; subject to provisions of other management plans, the Upper Subdistrict set gillnet fishery will fish regular weekly fishing periods as specified in 5 AAC 21.320, through July 20, unless the department determines that the minimum in-river goal will not be met, at which time the fishery shall be closed or restricted as necessary; the commissioner may by emergency order, allow extra fishing periods of no more than 24 hours per week or per provisions in 5 AAC 21.365;

At run strengths of 2,300,000-4,600,000 sockeye salmon, the department shall manage for an inriver goal range of 1,000,000-1,200,000 sockeye salmon past the sonar counter at river mile 19; subject to provisions of other management plans, the Upper Subdistrict set gillnet fishery will

fish regular weekly fishing periods as specified in 5 AAC 21.320 through July 20, until the department makes a determination of run strength, whichever occurs first.
At run strengths greater than 4,600,000 sockeye salmon, the department shall manage for an inriver goal range of 1,100,000-1,350,000 sockeye salmon past the sonar counter at river mile 19; subject to provisions of other management plans, the Upper Subdistrict set gillnet fishery will fish regular weekly periods as specified in 5 AAC 21.320 through July 20, or until the department makes a determination of run strength, whichever comes first; if the department determines that the minimum in-river goal will not be met, the fishery shall be closed or restricted as necessary; the commissioner may, by emergency order, allow extra fishing periods of no more than 84 hours per week, except as provided in 5 AAC.21.365; and the Upper Subdistrict set gillnet fishery will be closed for one continuous 36-hour period per week, beginning between 7:00 p.m. Thursday and 7:00 a.m. Friday. The remaining elements of the plan relate to the inriver personal use and sport fishery.

Kasilof River Salmon Management Plan (5 AAC 21.365)

The bulk of this plan deals specifically with guidance on managing the commercial fishery for meeting the escapement goal as specified within the plan, however there are several sections that intersect with the Kenai River sockeye salmon: after July 15, if the department determines that the Kenai River late-run sockeye salmon run strength is projected to be less than 2,300,000 fish and the 390,000 optimal escapement goal for the Kasilof River sockeye salmon may be exceeded, the commissioner may, by emergency order, open fishing for an additional 24 hours per week in the Kasilof Section within one-half mile of shore and as specified in 5 AAC 21.360(c).

Additional Commercial Fishery Management Plans: *Cook Inlet Pink Salmon Management Plan (5 AAC 21.354); Kenai River Late-Run King Salmon Management Plan (5 AAC 21.359);Upper Cook Inlet Salmon Management Plan (5 AAC 21.363); Northern District King Salmon Management Plan (5 AAC 21.366).*

Sport Fishery Management Plans: *Russian River Sockeye Salmon Management Plan (5 AAC 57.150)***;** *Kenai River and Kasilof River Early-run King Salmon Management Plan (5 AAC 57.160);Kenai River Coho Salmon Management Plan (5 AAC 57.170); and the Upper Cook Inlet Personal Use Salmon Fishery Management Plan (5 AAC 77.540).*

Fishery Management Complexity

When comparing a number of fishery related metrics, complexity can be characterized by geographic scope, species richness, multiple overlapping objectives, and numbers of users/gear types/permits (human participation) which overlap a large geographic area, and in Cook Inlet, where most of the area is road or boat accessible and fishing occurs in either freshwater or marine waters. It could also be characterized by the number of regulatory proposals submitted to the Board of Fisheries' three-year regulatory cycle and emergency orders issued by the department each year. Determining a measure that captures allocative related issues such as regulatory proposals or agenda change requests (ACRs) is difficult, but there are many allocative elements interwoven within the Upper Cook Inlet fisheries and imbedded within the various salmon management plans.

Personal Use Fishery

Subsistence and personal use fisheries have undergone substantial changes within the Cook Inlet area over the last 20 plus years. There are four personal use fisheries that target primarily

sockeye salmon and collectively make up the bulk of the regulations embedded within the Personal Use management plan. The two major personal use fisheries operate adjacent to the Kasilof River, and adjacent to and within the lower portion of the Kenai River. Regarding the Kenai, retention of Chinook or king salmon has been prohibited for a number of years, owing to low production and concerns for meeting escapement goals. These two fisheries collectively are the largest participation fishery in Alaska. Over the last five years over 30,000 household permits have been issued and in several years the number of permits issued exceeds 35,000. During the years 2013-2015, average participation has been 27,850 household permits fished with an average sockeye salmon harvest of 494,115 per year (Dunker, 2018); the harvests of Kenai R. personal use sockeye salmon in 2014 and 2015 were 506,047 and 521,985 fish respectively. In 2016 the personal use fishery harvest was 264,900 sockeye salmon.

Kenai River Sport/Recreational Fishery

This fishery is arguably the largest sport/recreational fishery in Alaska with participation statistics, measured in angler days, ranging from 365,000-485,000 days annually. Sport fishing effort is spread throughout the drainage; however, a majority of the effort is concentrated below the Soldotna Bridge to tidewater. The annual recreational harvest of sockeye salmon occurs both above the sonar counting station at river mile 19 and below with an average of 20% of the harvest occurring below the counting station. The average (2011-2015) annual harvest of sockeye salmon is 422,480, of which 86,920 fish are harvested below the escapement enumeration or sonar site. The 2014 sockeye salmon harvest was 380,055 and for 2015 it was 392,116 fish (Begich et al. 2017). The recreational harvest for 2016 was 342,446 sockeye salmon.

When combined (personal use and in-river sport), the harvests have averaged 688,676 sockeye salmon annually (2014-2017; ADF&G personal communication). The Kenai River sockeye salmon escapement over these years has ranged from 1,400,047 in 2015 to 1,073,290 fish in 2017 and averaged 1,203,125 fish (Table 1.)

Fishery Management Data Sources

Escapement monitoring

Escapement has been assessed using side-scan sonar for a lengthy time period for the Kenai and Kasilof rivers and has incorporated modern gear (Bendix to DIDSON to now ARIS technology). The counts are generated daily and employed to evaluate escapement relative to fishery management decisions. There have not been any independent verifications of either the Kenai or Kasilof sonar escapement estimates. When converting to modern technology, the Bendix and DIDSON sonar systems were determined to offer almost identical escapement passage estimates for the Kasilof River, but that the Bendix system for the Kenai system generated escapement estimates that were substantially less that the estimates generated by the DIDSON system. This was also the case for the Yentna River (Maxwell et al. 2011). This information was integrated into a conversion from BENDIX to DIDSON units for the Kenai River sockeye salmon escapement, such that historical and contemporary escapement numbers were consistent.

For the Yentna River, the use of sonar to enumerate escapement was discontinued in 2008 due to the considerable uncertainty associated with the estimates (Fair et al. 2009). The current escapement monitoring program consists of counting weirs on Chelatna and Judd lakes. Similarly, for the Sustina River, a counting weir at Larson Lake is employed as an index of the Susitna River mainstem escapement. Fair et al. (2009), as a means to estimate total drainage wide escapement for the Yentna and Susitna rivers sockeye salmon stocks, employed the relationship between weir counts and a series of mark-recapture estimates to expand the weir

counts into drainage wide estimates. The identified relationships include Larson Lake weir counts accounting for 50-54% of the drainage wide mark-recapture estimates generated for 2006-2008. For the Yentna River, the relationship between the weir counts and the mark-recapture estimates ranged from 41-44% for Chelatna and Judd lakes combined. This approach certainly seems reasonable, however there is quite a bit of uncertainty about carrying this relationship forward to estimate total escapement for these drainages, especially when accounting for differential productivity that can occur with sockeye salmon populations between adjacent years, and also employing mark-recapture estimates which have their own set of assumptions and challenges.

There are numerous sockeye producing systems within Cook Inlet that have no monitoring programs, but that production contributes to the overall harvest. Shields (2010), within the annual management report, cites that the contribution of these unmonitored systems was projected to contribute upwards of 13% (835,000 fish from a total run of 6,404,000) to the Upper Cook Inlet harvest with an unknown level of escapement.

Barclay (2017) reported that for the years 2014-2016 that the unreported harvest (catch that could not be assigned to one of the predetermined sockeye stock groupings within UCI) represented 9.5% (223,106; 2014), 5.2% (138,826 fish) for 2015 and <0.1% (15,518 fish) in 2016. These findings are not uncommon with mixed stock analyses when dealing with many stocks and in most cases for small stocks. Shedd et al. (2016) aptly discusses this routine challenge by stating "Additionally, it is necessary to recognize that even with fishery samples of 380 fish per stratum, it is challenging to estimate small proportions in a mixture". Based on these recognized analytical difficulties, and the stated uncertainties regarding escapements for several Upper Cook Inlet sockeye stocks, the most prudent way to evaluate estimates of non-local stock harvest is to compare harvest or proportions of the harvest. The harvest, whether it is commercial (fish ticket receipts), recreational (Statewide Harvest survey) or personal use (household permit record) is likely the most certain source of data that managers have available to them.

Offshore Test Fishery (OTF; 2014-2017)

One of the most important data sources for UCI in-season management, given the wide array of objectives dictated by regulations promulgated by the Alaska Board of Fisheries within the last 10 years, is the offshore test fishery (OTF) which was initiated in 1979. Many of the plans and subsequent regulation changes have requirements specifically related to inseason abundance estimates. These projections are employed to make in-season management decisions attempting to meet escapement objectives for Susitna bound sockeye stocks, and for sockeye destined for the Kenai and Kasilof rivers as well. The Kenai River late-run sockeye salmon management plan and attendant prescribed fishing times for the drift and set gillnet fisheries rely heavily on this estimate, based on a multi layered tier system.

2014

The midpoint of the 2014 sockeye salmon run at the OTF occurred on July 16 (point at which 50% of the run is projected to be past the OTF). There were two formal inseason estimates of the 2014 run size made on July 21 and 23; the 23 July analysis predicted a total run of 5.8-9.1 million sockeye salmon. The best fit total run estimate deviated from the actual run of 5.28 million fish by 72% or a difference of 3.82 million fish. The best fit Kenai river total run estimate from this analysis (5.65 million) differed from the actual total run of 3.28 million fish also by 72%, representing a difference of 1.83 million fish (Dupuis et al. 2016).

2015
The midpoint of the 2015 sockeye salmon run at the OTF occurred on July 25. A formal in-season estimate of run size was made on July 27 and predicted a total run to Upper Cook Inlet of 5.9 million sockeye salmon. The best-fit total run estimate deviated from the estimated total run of 6.30 million by 6.5% (400,000 fish). An in-season estimate was also made for the Kenai River sockeye salmon run on July 27; the analysis predicted a total run to the Kenai River ranging between 2.20-3.53 million sockeye salmon. The best-fit total run estimate of Kenai River sockeye salmon was 3.53 million which deviated from the estimated total run of 3.89 million fish by 9.3% (360,000 fish; Dupuis and Willette, 2016).
2016
The midpoint of the 2016 sockeye salmon run at the OTF occurred on July 18. An in-season estimate of the 2016 run was generated on July 25 and predicted a total run to Upper Cook Inlet (UCI) of 6.83 million sockeye salmon. The best-fit model estimate varied from the total run estimate of 5.11 million by 33.7% or 1.72 million fish. The inseason estimate for Kenai River sockeye salmon was made on July 25 with an estimate of 3.53-5.57 million fish with a post season estimate of 3.55 million sockeye. Managers employed a run estimate of 4.6 million fish, an overestimate of 29.5% (1,050,000 fish; Dupuis and Willette 2018).
2017
The midpoint of the sockeye salmon run in 2017 at the OTF was July 20; a formal estimate of the run was generated on July 24 with a prediction of 7.11 million fish. The first best-fit total run prediction was 54.2% higher than the actual total run of 3.85 million (difference of 3.26 million fish). An in-season estimate for the Kenai River sockeye run was made on July 24 resulting in an estimate of 1.6-4.3 million sockeye (actual post season estimate was: 2.89 million or 44.5% (1.29 million fish below actual), or conversely 48.7% higher than actual. Regardless of which direction the error is evaluated, it was substantial (about 1.3 million fish; Frothingham and Willette 2018).

Synthesis of information

- Using an average 2014-2016 Kenai R. commercial harvest rate (catch/catch+escapement) of 57.1%, the following would be the fate of 75,000 hypothetical sockeye that enter UCI destined for the Susitna/Yentna Rivers combined: 23,982 fish would become drift gillnet harvest, 18,843 fish would become set net harvest, 3,854 harvested fish would be assigned to an unreported stock group, 9,750 sockeye would escape to unmonitored streams, and 18,571 fish would make it to the Susitna/Yentna Rivers, of which a total of 9,000 sockeye would be potentially counted at Judd, Chelatna or Larson lake weirs. The potential benefits (escapement or harvest to UCI users) would be undetectable amidst the large total harvests and monitored escapements in Upper Cook Inlet.

- The complexity of existing UCI salmon management plans far exceeds the quality, quantity and timeliness of the information available. Management staff in the department do a surprisingly successful job managing these fisheries and meeting escapement goals and objectives given the data available and estimate uncertainty.

- Estimates of harvest have far less uncertainty than do the variety of in season run strength projections or data from the numerous escapement monitoring programs,

especially the Susitna River escapement component. Therefore, the harvest estimates for UCI bound sockeye that were incidentally taken in Kodiak should be compared to the total harvest of UCI sockeye.

- In 2014, there were an estimated 58,506 sockeye salmon harvested within the KMA of Cook Inlet origin (Kenai and Susitna stocks) from a total UCI harvest of 3,360,383 or 1.7%;
- In 2015, an estimated 438,433 Kenai and Susitna fish were harvested in the KMA versus the total harvest of 3,694,270 sockeye in the UCI or 11.8%;
- In 2016, 309,497 UCI (Kenai and Susitna stocks) sockeye were identified within the Kodiak catch compared to a total UCI sockeye harvest of 3,095,833, or 10.0%.

- The OTF run projections have errors around the estimates that are alarming (over projecting the actual run by 60%) given the reliance on this in-season tool within several prominent management plans; the Kenai R. sockeye run projection placed the run in the wrong management tier 2 out of 4 years (2014, 2016) thus allowing for increased fishing time for the drift gillnet fleet.

- Any proposed regulatory change to long established salmon fishery management plans must be numerically measurable. Given poor data quality for specific escapements or to certain in-river-runs (Kenai R.) the information system currently in place is incapable of this task, even if harvests within the KMA were twice those that are currently estimated.

- Certainly, for a system such as the Susitna River with all of its documented longstanding problems in obtaining reliable and annual escapement estimates, is it not prudent to reach out and affect an adjacent management area. Currently, in order to generate Susitna River escapement estimates, the weir count (known escapement numbers) is multiplied by a constant derived from a mark-recapture study conducted for 3 three years that is now over 10 years old. Because of this unreliable method, the Susitna and Yentna Rivers escapement estimates should be treated as informative but certainly not known.

- Given the focus on coho salmon within the last three UCI board meetings (2011,2014, 2017), and the conservative stipulations within the Northern District management plan, if all of the sockeye incidentally caught in Kodiak were inserted into the UCI fishery mix, it would not have resulted in any beneficial impact to Northern District coho stocks nor in-river users. Coho salmon run strength is based on fishery performance (commercial and in-river sport) and not demonstrable escapement estimates.

- Evaluating the commercial harvest of UCI stocks using a harvest rate metric would likely be erroneous, owing to the uncertainty surrounding the escapement estimates of

the Susitna River, Yentna River and other unassessed sockeye stocks. These stocks contribute to the harvest, but escapement to these systems is unknown or indexed, not counted.

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Kodiak Seiners Association
PO Box 8835
Kodiak, AK 99615

December 12, 2019

Alaska Board of Fisheries
Board Support Section
P.O. Box 115526
Juneau, AK 99811-5526

RE: **Oppose Proposal 66**

Dear Chairman Morisky and Board of Fish Members:

The Kodiak Seiners Association respectfully requests that you **reject proposal 66**, which intends to impose arbitrary, onerous, and draconian harvest caps on sockeye caught in the Kodiak fishery. This proposal clearly disregards the reality of our fishery and perpetuates a fantasy world in which the entire universe is to be regulated based on the demands of the Cook Inlet drift fleet. The adoption of the proposal would require the Board to essentially eliminate the Kodiak area management plan and to ignore virtually every guiding principle that is used to direct Board policy ranging from Article VIII of the Alaska state constitution to the sustainable salmon policy and the mixed stock fisheries policy. We do not consider this to be a serious proposal and we hope that the Board will succinctly reject it.

Please see our comments on other proposals addressing mixed stock harvest in Kodiak and concerns about the harvest of Cook Inlet stocks. Thank you for your time.

Kodiak Seiners Association represents 157 members, including the majority of actively fishing SO1K seine permit holders, Kodiak and Homer-based businesses, and individual crewmembers. Our focus is advocacy for our membership through positive interactions with ADF&G, the Board of Fisheries, and our State Legislature.

Sincerely,

Nate Rose
KSA President

Mark Beardsley
PO Box 8776
Kodiak, AK 99615

December 22, 2019

Alaska Board of Fisheries
Reed Morisky, Chair
Attn: Glen Haight, Executive Director
1255 W 8th Street
P.O. Box 115526
Juneau, AK 99811-5526

RE: Opposition to proposal 66

Dear Chairman Morisky and members of the Board of Fisheries,

Thank you for the opportunity to comment on proposal 66 in advance of the Board meeting for Kodiak. I request you oppose this proposal as it presents unnecessary change to an already fine-tuned and very complex management plan for the Kodiak Management Area (KMA) salmon fishery.

Proposal 66 suggests modifying a mixed stock fishery that has been running smoothly for 30+ years. The suggested weekly caps can realistically be achieved within 1 single day, based solely on Kodiak sockeye returning to local systems, potentially resulting in over escapement of local Kodiak stocks, significant foregone opportunities and the potential dismantling of the local Kodiak salmon fishery. This proposal is not based on new data, there has always been incidental catch of Cook Inlet bound salmon and it has been this way for hundreds of years. Additionally, the incidental harvest of Cook Inlet bound sockeye was dealt with back in 1989 and continues to be a functioning element of the KMA plan.

If this proposal passes it would also have a detrimental chain reaction to the Northwest setnet fleet, which in recent years, has been struggling. The passage of this proposal would ultimately push the seine fleet into the Central section of the Northwest District which is a mixed gear area already congested, resulting in further competition amongst our mixed gear groups and potentially put us out of business.

The KMA salmon plan is a very complex fishery that is managed for local Kodiak stocks, includes mechanisms addressing incidental catch and currently provides corridors for passage of salmon. I respectfully ask the Board to reject proposal 66.

Sincerely,

Mark Beardsley

December 24, 2019

Matthew Alward

60082 Clarice Way

Homer, AK 99603

Alaska Board of Fisheries
Board Support Section
P.O. Box 115526
Juneau, AK 99811-5526

RE: Opposition to proposal 66

Dear Chairman Morisky and board of fisheries members,

I'm from Homer, AK and I operate my own salmon seine boat in Kodiak, and I oppose proposal 66 witch if enacted would create massive economic loss to the Kodiak community and salmon fishermen and lost revenue to the state of Alaska. I raised our kids on the back deck of our family fishing boat and they have all spent months of their lives fishing in the regulatory areas that would see a considerable loss of fishing time as a result of this proposal passing.

Proposal 66 seeks to create a new Kodiak management plan that would alter the Alitak, Westside, and Eastside areas from the beginning of the last week of June and four weeks of July. It seeks to put in place weekly and seasonal sockeye harvest caps that when the sockeye harvests in those sections reach within 15% of either of the caps the seine fishery would be limited to a line one half mile inside of the headlands of bays. The current management plans for these areas have been in place for nearly 50 years, encompass 6 districts and 36 sections, and are based on local Kodiak Sockeye, Chum, Pink, and Silver salmon runs. There are multiple overlapping runs of all salmon species that these three management plans take into account in a complex and adaptive manner and this proposal with throw all of that out and just manage for a set sockeye harvest each week. The justification for this proposal is a claim that we now know much more than we did in 1989, when the North Shelikof management plan was enacted, about the timing, locations, extent and magnitude of the harvests of the Cook Inlet origin salmon stocks.

The Westside management area is comprised of the north and south sections which contain the Karluk and Ayakulik rivers respectively both of which have historically considerably sized sockeye runs which daily weir escapement numbers show are ongoing during the period of the last week of June through four weeks of July. The North West region also contains the Telrod Cove enhanced sockeye run that is a known portion of the Westside sockeye harvest during the proposed time frame. Proposal 66 would create a 12,500 weekly sockeye harvest cap for the entire Westside area which some years is a fraction of the weekly sockeye escapement numbers let alone the Karluk, Ayakulik and Telrod sockeye harvests. There can also be considerable chum and pink salmon harvests in the Westside area occurring at the same time as sockeye are harvested. The central section of the Westside area is also a set net fishery that is managed with the same management plan as the seine fishery and this action would create two separate plans with different management goals for the same fishery. The Alitak section has several

sockeye runs occurring during the time frame that this management plan would cover with weekly weir escapement numbers and local sockeye harvests that far exceed the 5,000 fish harvest cap that is proposed. There also can be considerable chum and pink salmon harvests during this time period. The Eastside has a large chum and sometimes pink salmon harvest during this time frame along with sockeye harvests that usually far exceed the proposed 5,000 sockeye weekly harvest allowed during this time frame. If this proposal was adopted it would cause massive lost harvest opportunity on local sockeye, chum, and pink salmon stocks and risk over escaping some of the Kodiak systems.

In closing I ask that you keep the complex multi species management plans that have been working well for decades in place and do not adopt proposal 66.

Sincerely,

Matthew Alward

Mike Ferris
F/V Cally Rose
12/13/2019 11:11 PM AKST

RE: PROPOSAL 66 Create a Kodiak Area Salmon Management Plan

I have been involved & am a salmon permit holder & active participant in the Kodiak area salmon seine fishery for over 30 years & believe there is no change needed in a effect & proven management plan that has been in place for 30 years.

Naomi Hall

12/27/2019 09:33 PM AKST

RE: PROPOSAL 66 Create a Kodiak Area Salmon Management Plan

My name is Naomi Hall, I am writing because I am opposed to proposal 66. Language in the proposal claims it will "apply to the seine fishery;" however, it also states that if adopted it will "create a new Kodiak Area Management (umbrella) Plan." This would not apply just to the seine fishery, but to the set gillnet fishery on the island as well. I grew up setnetting on the Westside of Kodiak Island; today, my husband and I own a site where we are raising our young family. The potential restrictions to fishing time outlined in proposal 66 would result in setnetting not being a reliable source of income for my family. The Kodiak Area Management Plan is complex and has been developed over the last 30+ years taking into account these same outside pressures and requests. Please think about the detrimental impacts this proposal would have to the Kodiak area and the cost of implementing, executing, and managing this complex proposal.

Nicholas Hoffman
PO Box 1212
Kodiak, AK 99615

12/24/19

Chairman Reed Moriskey
Alaska Board of Fisheries
Board Support Section
P.O. Box 115526
Juneau, AK 99811-5526

RE: Oppose Proposal 66

Dear Chairman Morisky and Board of Fish members:

I'm a young Kodiak salmon fisherman. I have been running a seine boat since 2011 as well as participating in Kodiak halibut, sea cumber, cod jig, and tanner crab fisheries. I respectfully request the Board reject Proposal 66.

This proposal is based on extremely limited data. Data from only a few days in 2016 and also some collected from setnets rather than seiners. Even this limited study showed nothing new, only confirmed something everyone already knows: Cook Inlet bound fish swim through Kodiak waters. According to the Constitution of the State of Alaska, Article 8, Section 3, "fish, wildlife, and waters are reserved to the people for common use." This proposal seeks to favor one area over another demanding that Kodiak be limited in favor of Cook Inlet which is several hundred miles away. This is not a conservation issue, but simply Cook Inlet's fishermen trying to limit a neighboring fishery.

This proposal is not based on any kind of reality of how salmon fishing in Kodiak works. A significant number of our multi-species producing rivers are on capes and not in the bays. The sockeye caps would be exceeded by our own local sockeye runs alone forcing a non-conservation related closure which could cause over-escapement of pink and chum salmon endangering the entire fishery.

The Kodiak Management Plan is a solid mixed stock management plan that works well to balance the needs of the different species of salmon in Kodiak and already has controlled safeguards for the interception of Cook Inlet fish in the North Shelikof Strait Management Plan.

If allowed to go forward would become a disastrous conservation issue for Kodiak.

I see no reason for the Board to make any changes to the Kodiak Salmon Management plan. Thank you for the opportunity to comment on the proposals and the chance for my voice to be heard. I look forward to the Board of Fish members getting to spend time in Kodiak and learn more about our town and fishing community.

I humbly request the Board reject Proposal 66.

Sincerely,

Nicholas Hoffman
F/V Relentless

Oliver Holm
self
12/27/2019 04:22 PM AKST

RE: PROPOSAL 66 Create a Kodiak Area Salmon Management Plan

This proposal if adopted would place a tremendous burden on the department's management team as well as create havoc in our fishery. It has been well known for decades that Cook Inlet sockeye are sometimes present in Kodiak catches. These catches have occurred for at least one hundred years here. They are sporadic and hard to predict and are often a tiny fraction of the catch. The weekly catch limits are often lower than the demonstrated catch of local sockeye and ignore the reality that through much of July in many areas the bulk of the catches are Kodiak pink and chum salmon. There is a presumption in the proposal that Cook Inlet sockeye are mostly present offshore in the three mile zone that we are restricted to. This is often not the case. They can show up in the most unlikely places. Places that Kodiak sockeye, pinks and chums are usually the dominant catch. The limited entry system did not grant ownership of salmon originating in each region to the region's permit holders. The permits are a right to fish in a specific region. In 1989 the BOF dealt with an unusual fishing pattern on the mainland when a 10 million plus return of Kenai sockeye occurred. Under the mixed stock fish policy and the allocation policy there is no reason to change our management plans due to Cook Inlet salmon. Changes to our management plans for seiners would lead to extended conflicts between seiners and set netters. Salmon production in July and August is not limited to the larger bays as salmon streams emptying out to outside waters occur all around the islands. The Kodiak Salmon Work Group has a map from ADF&G showing the areas within five N. Miles of our salmon streams. There are very few areas in state waters that aren't within this distance of local salmon streams.

Peter Danelski Jr.

12/28/2019 12:27 AM AKST

RE: PROPOSAL 66 Create a Kodiak Area Salmon Management Plan

This comment is in reference to multiple proposals. I oppose proposals 37, 58,59,60,61,62,63,64, 65 and 66. Outside interests have put forth proposals to open up Kodiak's management plan to sweeping changes that will greatly decrease Kodiak's ability to manage it's own salmon fishing periods, and have no assurance of actually fixing any problems anywhere else. I could go into great detail about our fine-tuned and complex existing management plan, the long history of Kodiak salmon fishing areas, incidental catch of Kodiak bound fish in other areas, and the danger of using very incomplete and potentially misleading data to form conclusions, but I'm sure that will all be covered many times in testimony and discussion. I would like to cover more personal issues. Often the biggest outcomes of board of fish decisions are not directly related to the issue and can change the trajectory of whole communities and lives. I grew up setnetting in Uyak Bay on the west side of Kodiak. I went away to college and got a biology degree but I could never bring myself to give up fishing and I made it my career. My wife and I built a cabin near the site I grew up at and we have 3 kids under the age of 12 now who spend the summers at the site. My parents continue to fish and it is one big family operation. We live in Kodiak during the winter, and I make my first trip out to the site by the first week of May. I don't close it up until the middle of October. It ends up being a six-month season. Kodiak salmon is the majority of our income and a huge part of our lives. We fish in the Central Section of the Northwest Kodiak District, along with about 100 other Kodiak setnet permits, and at times, most of the seine fleet. I don't fish on the mainland or off shore but I compete with those who do. Lately our catch has been proportionally smaller than it used to be. It is difficult to conclude why, but I'm certain shrinking the area and time of the whole Kodiak fleet would be further detrimental to our livelihood. It might even make it economically unviable. I can't go anywhere else, it's crowded and it would get more crowded if Kodiak fishermen could not fish their traditional grounds. As spring rolls around every year, our two sons and their younger sister look forward to the move to "the cabin" Liam, our oldest has started coming out with me for the first trip out after the winter. He helps take boards off the windows, sets up running lines and watches the water for the first "jumper". I've always been proud of the way I make a living. With minor environmental impact, we harvest very high quality food while living with nature. My parents started our operation, I grew up doing it and now the third generation pulls the skiff in and gets out on the water every day. Please consider that the Kodiak management plan is more than just a document. It is people who have poured their whole lives into the Kodiak salmon fishery and it shouldn't be messed with from miles away with inconclusive and misleading arguments. Thank you for considering my comments. I have included a picture of my son in the skiff and him unloading Salmon with his grandfather who started our business in 1972.

PC363
2 of 3


WORK VEST

December 25, 2019

Quinn Alward

60082 Clarice Way

Homer, AK 99603

Alaska Board of Fisheries
Board Support Section
P.O. Box 115526
Juneau, AK 99811-5526

RE: Opposition to proposal 66

Dear Chairman Morisky and board of fisheries members,

My name is Quinn Alward and I grew up fishing in the waters of Kodiak on my father's seiner since I was 10. I am now turning 22 and seining on the Westside of Kodiak Island and the surrounding areas has made me the person I am today. It has given me the opportunity to go to college, to have enough money to give back to my hometown of Homer, Alaska and to meet some of the most important people in my life.

I oppose proposal 66 because if passed it will cause economic loss to not only the fisherman like myself who rely on the salmon fishery of Kodiak, but also to the communities that this money goes back into like Kodiak town, villages in the Kodiak Archipelago, the towns and cities of the Kenai Peninsula and areas beyond these as well.

Proposal 66 intends to replace the current Westside and Alitak management plans for the Kodiak area that have been in place for almost 50 years with one that ignores the local Pink, Chum and Coho runs just so they can set a weekly and seasonal Sockeye harvest limit. Over the last 11 years of fishing in the waters of the Westside of Kodiak island I have seen just how sporadic the harvest of not only Sockeye but all salmon in Kodiak can be on a week to week basis. The current management plans which has been working for almost half a century are complex and focused on all salmon species in the area, and it has been designed to minimize negative impacts on the salmon runs while optimizing fishing opportunities for us fishermen.

Proposal 66 would create a 12,500 weekly sockeye harvest cap for the entire Westside area, and I know that this will affect the smaller family-owned fishing boats out of the area the most. The Westside of Kodiak is known for its nautical weather rolling through Shelikof Strait, and a lot of local fishing families on the Westside of Kodiak wait out those storms to go out and fish. On the other hand there are fisherman on the Island who fish in any weather, and these few boats who can work in almost any conditions will be catching the entire weekly quota of Sockeye leaving the smaller family owned operations to not be making any money and seeing smaller and smaller profit margins.

Finally, I do plan to continue in the commercial fishing industry of Alaska, and more specifically the Kodiak area. Fishing those waters is a part of who I am and to run my own boat and someday support a family of my own through the Kodiak fishery is a dream of mine. But proposals like this do make me worry more and more about the future of the industry and makes my dream seem less achievable.

To conclude, I implore you to keep managing the Kodiak salmon run with the complex multi-species management plans already in place and to not adopt proposal 66.

Sincerely,

Quinn Alward

December 24, 2019

Alaska Board of Fisheries
Board Support Section
P.O. Box 115526
Juneau, AK 99811-5526

Re: Opposition to Proposal 66

Dear Chairman Morisky and Board of Fisheries Members,

I am Richard Roth, Kodiak salmon purse seine permit holder. Thank you for the opportunity to comment on proposals for the Kodiak finfish meeting. My wife three children and I reside in Homer, but fish in Kodiak. I own and operate the F/V Sea tzar. We rely solely on salmon seining for our livelihood and annual income to support our business, our family and contribute to our Alaskan economy through business and personal expenditures.

The author of this proposal is citing a genetic study showing nothing new, simply a confirmation of something already known – that Cook Inlet origin sockeye sometimes swim through Kodiak waters. There are measures already in place (such as the North Shelikof Management Plan) that address this, to ensure that the vast majority of Cook Inlet- bound sockeye that do swim the Shelikof, make it through. Placing a cape to cape line on the mainland would keep Kodiak-area managers from maintaining the stability of local pink, silver, and chum salmon and raise serious concerns and precedents about the underlying foundation of common property fisheries in the State of Alaska.

Instead of an attempt to restructure the fisheries in a neighboring region, the Board's time would be better spent investigating the number of years the Kenai and Kasilof rivers have exceeded their escapement, and yet Cook Inlet drift-gillnetters and set-gillnetters still have minimal fishing time when in other regions there would be emergency openings to maintain the health of fish stocks and the rivers. For example, 2019 was a banner year, and yet commercial fishermen were forced to sit on their hands while the Kenai and Kasilof rivers were over-escaped by the hundreds of thousands.

The Kodiak Management Plan is a solid plan that has a proven working track record. The author appears to have little care for the success and sustainability of the management plan in our region and how it allows for the harvesting of local sockeye, pinks, silvers and chums.

I wish all the best to the user-groups of the Cook Inlet Region and hope that in the near future the user groups and management will be able to work together for more peaceful fisheries and sustainable and strong runs in that region.

I strongly encourage the Board to reject proposal #66.

Thank you for your careful consideration,

Richard, Amanda, Stephanie, Noah, and Ranger Roth
F/V Sea Tzar
Homer, AK

December 19, 2019

Robert Fellows

266 E Bayview Ave.

Homer, AK. 99603

Alaska Board of Fisheries

Board Support Section

PO Box 115526

Juneau, Ak. 99811-5526

RE: Opposition to proposal 66

Dear Chairman Morisky and Board of Fisheries members,

I am a commercial salmon fisherman in the Kodiak management area. I have been participating in that fishery and supporting my family from that fishery for 29 years. Restrictions under this proposal would make it extremely hard to harvest local stocks. This in turn would make it impossible for me to continue to make a living for my family and crew. I respectfully request the Board reject proposal #66.

An umbrella sockeye management plan for the Kodiak are is ridiculous. It would prevent proper management of local pink, chum, and sockeye stocks. The genetic data used by the proposer was taken from setnet harvests only and so it has no relevance to the seine harvest.

There is already a management plan in place that addresses harvest of Cook Inlet bound sockeye in the Kodiak management area. The existing management plan is already very restrictive, and, in many years, closures are triggered from harvest of local sockeye alone. The Kodiak area has been under this restrictive plan since 1989 and does not need further restrictions.

The proposer is trying to create more Cook Inlet sockeye where most of the time there are none. This Cook Inlet group would find far more fish in addressing issues within their own area. Such as the gross over escapement into the Kenai River on a yearly basis. It is not Kodiaks fault that management practices in the Cook Inlet area have changed since 1989.

Sincerely,

Robert Fellows

RE: PROPOSAL 66 Create a Kodiak Area Salmon Management Plan

December 24, 2019 Alaska Board of Fisheries Board Support Section P.O. Box 115526 Juneau, AK 99811-5526 Re: Opposition to Proposal 66 Dear Chairman Morisky and Board of Fisheries Members, I am Steve Roth, Kodiak and Lower Cook Inlet salmon purse seine permit holder. Thank you for the opportunity to comment on proposals for the Kodiak finfish meeting. My wife and I reside in Homer, but fish in Kodiak. I own and operate the F/V Sea Grace. We rely solely on salmon seining for our livelihood and annual income to support our business, our family and contribute to our Alaskan economy through business and personal expenditures. ? The author of this proposal is citing a genetic study showing nothing new, simply a confirmation of something already known – that Cook Inlet origin sockeye sometimes swim through Kodiak waters. There are measures already in place (such as the North Shelikof Management Plan) that address this, to ensure that the vast majority of Cook Inlet- bound sockeye that do swim the Shelikof, make it through. Placing a cape to cape line on the mainland would keep Kodiak-area managers from maintaining the stability of local pink, silver, and chum salmon and raise serious concerns and precedents about the underlying foundation of common property fisheries in the State of Alaska. Instead of an attempt to restructure the fisheries in a neighboring region, the Board's time would be better spent investigating the number of years the Kenai and Kasilof rivers have exceeded their escapement, and yet Cook Inlet drift-gillnetters and set-gillnetters still have minimal fishing time when in other regions there would be emergency openings to maintain the health of fish stocks and the rivers. For example, 2019 was a banner year, and yet commercial fishermen were forced to sit on their hands while the Kenai and Kasilof rivers were over-escaped by the hundreds of thousands. The Kodiak Management Plan is a solid plan that has a proven working track record. The author appears to have little care for the success and sustainability of the management plan in our region and how it allows for the harvesting of local sockeye, pinks, silvers and chums. I wish all the best to the user-groups of the Cook Inlet Region and hope that in the near future the user groups and management will be able to work together for more peaceful fisheries and sustainable and strong runs in that region. I strongly encourage the Board to reject proposal #66. Thank you for your careful consideration, Steve and Jenny Roth? F/V Sea Grace Homer, AK

Tyler-Rose Hoffman
PO Box 1212
Kodiak, AK 99615

12/24/19

Chairman Reed Moriskey
Alaska Board of Fisheries
Board Support Section
P.O. Box 115526
Juneau, AK 99811-5526

RE: **Oppose Proposal 66**

Dear Chairman Morisky and Board of Fish members:

I live in Kodiak and my husband and I operate a commercial fishing business. We rely on salmon for the bulk of our income, though we also participate in halibut, sea cucumber, and cod fisheries. Our ability to stay in Kodiak depends on the health of the Kodiak salmon fishery. I respectfully request the Board reject Proposal 66.

This proposal would inflict entirely unrealistic and unfair restrictions on Kodiak fishermen. The caps would be reached by local stock alone preventing the harvest of pinks and chums. Instituting this proposal would require the Board to disregard most of their guiding principles including Article VIII of the Alaska state constitution and other management principles.

The Kodiak Salmon Management plan is good as it is and I see no need for any changes to it. Thank you for the opportunity to comment on the proposals before the meeting. As always, I look forward to visitors getting to enjoy our great town and vibrant fishing community.

I humbly request the Board reject Proposal 66.

Sincerely,

Tyler-Rose Hoffman
F/V Relentless

Oliver Holm
self
12/27/2019 03:33 PM AKST

RE: PROPOSAL 67 Allow the use of single filament mesh web in a set gillnet in the Kodiak Area

Monofilament web may address the slime issue but will probably increase the drop out rate and thus create some loss to the fishery. It will likely increase the efficiency of gill net gear for pinks, chum, and coho if not for sockeye. If this proposal is adopted, seiners should be allowed to replace the 7 inch lead web for standard seine web for sewn on leads as has been done in other areas.

December 22, 2019
Darren Platt (FV Agnes Sabine)
10708 Birch Cir
Kodiak, AK 99615

Alaska Board of Fisheries
Board Support Section
PO Box 115526
Juneau, AK 99811-5526

RE: **Proposal 67**

To the members of the Alaska Board of Fisheries,

I'm writing in **support to proposal 67** if and only if a **3-year sunset clause** be placed on the proposal to give the collective fishing community more time understand the impacts of the gear change. I'm a seiner in Kodiak, and I sympathize with setnet fishermen who in the past were plagued by slime, although it apparently wasn't an issue last year. I don't understand exactly how or if monofilament will solve this problem but I've been led to believe that mono would make gillnets more efficient but also potentially lead to more wasted and injured fish due to high rates of drop-out. Nevertheless, I think the setnet fleet should be granted a 3-year trial period and then we should evaluate the impacts during the next board cycle.

Thank you,
Darren Platt

Eric Taber

12/22/2019 02:50 PM AKST

RE: PROPOSAL 67 Allow the use of single filament mesh web in a set gillnet in the Kodiak Area

I oppose proposal 67, if nets were changed to single monofilament, they would less visible in the water, resulting in increased by catch. more birds, otter, porpoise and other animals would killed. the slime problem only lasts for 2 weeks, then its gone. Thank you.

Aaren Ellsworth

12/27/2019 11:53 PM AKST

RE: PROPOSAL 67 Allow the use of single filament mesh web in a set gillnet in the Kodiak Area

Dear Chairman Morisky and members of the Board of Fisheries, Thank you for the opportunity to comment on proposal 67.Our family has been setnetting in Uganik Bay on the westside of Kodiak since 1999. In a number of recent years, especially 2018, we saw a new type of algae/dinoflagellate slime appear in late summer. It is tenacious and virtually impossible to effectively remove from our multi-strand gill nets. When the nets are coated with the brown slime, our salmon catch goes virtually to zero. We'd really appreciate the opportunity to try single strand net which we believe may be easier to keep clean.

Adelia Myrick

12/26/2019 11:07 AM AKST

RE: PROPOSAL 67 Allow the use of single filament mesh web in a set gillnet in the Kodiak Area

Dear Board of Fish Members, I am writing in support of allowing single filament mesh web for setnetters in Kodiak. As a second generation fisherman who has been fishing since I was a toddler and took over from my parents a few years ago, I have seen how slime events can drastically shut down our fishery. I like a clean net and have both a volume pump and pressure washer that I use all the time, but when the slime hits no matter how often I wash the net, the fishing just dies. The pumps can't keep up with the slime that coats every single mesh to the point that it looks like a hairy chain link fence under water and weights an incredible amount. In 2017, which was the worst slime year in recent memory, when the slime hit, from one delivery to the next, I was down by 54%. This was August 14th. It is supposed to be just the start of our peak of pink fishing, which for my site is my bread and butter, but instead it basically ended. Of course every day is different, but even looking at it week by week, for the week prior to the slime event compared to the week when it first started, I was down by more than 70%! That is more than the normal varieties of salmon run timing and pulses would account for. That week should have still been very strong if not the strongest week of my fishing for the whole summer. It wasn't until the slime let off on August 28th that we started catching more fish again, which is the tail end of the season. In post season chats with our friends and neighbors who have seiners, we were complaining about the bad season and they said, "well, but weren't humpies pretty good?" No. And the reason is completely the slime. We were trying to wash our nets all the time but it would be dirty before we even finished washing. Single filament web has been tested by some setnetters and appears to hold promise as something that is more easily kept clean with our washing equipment in the even that we have slime in other years. It is something I would definitely like to be able to have as an option. I know it's allowed in other parts of the state and I think we could benefit from it here as another tool in our tool chests to try to salvage some fishing time in the event of slime events. Thank you for your consideration, Adelia Myrick Uganik Bay Setnetter

Anitra Winkler

12/26/2019 11:07 AM AKST

RE: PROPOSAL 67 Allow the use of single filament mesh web in a set gillnet in the Kodiak Area

There really is no reasonable reason to oppose this.

Corina Watt, Kodiak Setnet Commercial Fisherman
Trap Pt/ Moser Bay Fisheries: Alitak District with sites across Olga, Moser and Alitak Bays
12/25/2019 10:01 PM AKST

RE: PROPOSAL 67 Allow the use of single filament mesh web in a set gillnet in the Kodiak Area

I support proposal 67 PROPOSAL 67 5 AAC 18.331. Gillnet specifications and operations. Allow the use of single filament mesh web in a set gillnet in the Kodiak Area, as follows: Notwithstanding 5 AAC 39.250(c), in the Kodiak Area, a person may use single filament mesh web in a set gillnet. For the following reasons: 1) Single filament mesh will absorb and hold less slime during extreme slime events within Kodiak Setnet fishing periods. 2) This will prevent damage to Kodiak Setnet Salmon fishers gear during extreme slime events that occur during seasonal fishing periods. 3) This will prevent a loss of valuable fishing time and therefore harvest during productive Kodiak setnet salmon fishing periods.

Ed Fisher, Kodiak Setnet Commercial Salmon Fisherman
Trap Pt / Moser Bay Fisheries: Alitak District with sites across Olga, Moser & Alitak Bays
12/25/2019 10:44 PM AKST

RE: PROPOSAL 67 Allow the use of single filament mesh web in a set gillnet in the Kodiak Area

I support proposal 67 PROPOSAL 67 5 AAC 18.331. Gillnet specifications and operations. Allow the use of single filament mesh web in a set gillnet in the Kodiak Area, as follows: Notwithstanding 5 AAC 39.250(c), in the Kodiak Area, a person may use single filament mesh web in a set gillnet. For the following reasons: 1) Single filament mesh will absorb and hold less slime during extreme slime events within Kodiak Setnet fishing seasonal periods. 2) This will prevent damage to Kodiak Setnet Salmon fishers gear during extreme slime events that occur during seasonal fishing periods. 3) This will prevent a loss of valuable fishing time during productive Kodiak setnet salmon fishing periods.

Jamin Hall

12/27/2019 10:58 PM AKST

RE: PROPOSAL 67 Allow the use of single filament mesh web in a set gillnet in the Kodiak Area

My name is Jamin Hall, my wife and I have a set net site in Uganik Bay. I am writing in support of proposal 67. In 2017 and 2018 the west side of Kodiak experienced a massive “slime” event where brown slime stuck to nets. These events made catching fish nearly impossible. To combat this slime monofilament web would be very helpful in that it has far fewer facets and crevices for slime to catch on; and also making washing the net an easier, and less Sisyphean task. Monofilament is legal in many places, including various Alaska fisheries, so it would seem to be a non-issue.

Jane Petrich
Self/Family, Northwest Set Net
12/27/2019 11:25 AM AKST

RE: PROPOSAL 67 Allow the use of single filament mesh web in a set gillnet in the Kodiak Area

A proven strategy to combat the effects of climate change and support the historic set net fishery

Jason Watt Kodiak Setnet Commercial Fisherman
Trap Pt/ Moser Bay Fisheries: Alitak District with sites across Olga, Moser and Alitak Bays
12/25/2019 10:03 PM AKST

RE: PROPOSAL 67 Allow the use of single filament mesh web in a set gillnet in the Kodiak Area

I support proposal 67: 5 AAC 18.331. Gillnet specifications and operations. Allow the use of single filament mesh web in a set gillnet in the Kodiak Area, as follows: Notwithstanding 5 AAC 39.250(c), in the Kodiak Area, a person may use single filament mesh web in a set gillnet. For the following reasons: 1) Single filament mesh will absorb and hold less slime during extreme slime events within Kodiak Setnet fishing periods. 2) This will prevent damage to Kodiak Setnet Salmon fishers gear during extreme slime events that occur during seasonal fishing periods. 3) This will prevent a loss of valuable fishing time and therefore harvest during productive Kodiak setnet salmon fishing periods.

Jonathan Edwards

12/26/2019 11:16 AM AKST

RE: PROPOSAL 67 Allow the use of single filament mesh web in a set gillnet in the Kodiak Area

I have been a fisherman for 60 years and have used a number of different types of gill net webbing. The one that stays the cleanest is single strand nylon. this is of utmost importance to set netters in the Kodiak Management Area because, over recent years, we have been plagued by a thick gooey slime you can wash your net clean, and by the time you're done, it's slimed again. It totally stops your fishing. Single strand is one smooth strand, where as, what we fish now, is six or more strands twisted, a lot more crevices to stick to.

Judy Fisher, Kodiak Setnet Commercial Salmon Fisherman
Trap Pt/ Moser Bay Fisheries
12/25/2019 10:46 PM AKST

RE: PROPOSAL 67 Allow the use of single filament mesh web in a set gillnet in the Kodiak Area

I support proposal 67 PROPOSAL 67 5 AAC 18.331. Gillnet specifications and operations. Allow the use of single filament mesh web in a set gillnet in the Kodiak Area, as follows: Notwithstanding 5 AAC 39.250(c), in the Kodiak Area, a person may use single filament mesh web in a set gillnet. For the following reasons: 1) Single filament mesh will absorb and hold less slime during extreme slime events within Kodiak Setnet fishing seasonal periods. 2) This will prevent damage to Kodiak Setnet Salmon fishers gear during extreme slime events that occur during seasonal fishing periods. 3) This will prevent a loss of valuable fishing time during productive Kodiak setnet salmon fishing periods.

Kevin Fisher
Alitak District setnet Fisherman
12/27/2019 08:27 PM AKST

RE: PROPOSAL 67 Allow the use of single filament mesh web in a set gillnet in the Kodiak Area

I believe this proposal could help the setnet fleet on Kodiak , which are struggling to stay in business.

Mark Larsen

12/26/2019 01:44 PM AKST

RE: PROPOSAL 67 Allow the use of single filament mesh web in a set gillnet in the Kodiak Area

Dear Board of Fisheries Members, Thank you for your consideration of this proposal. Adopting it will allow set netters to deal with the increasing amounts of slime that are effectively shutting down our participation in the fishery at times. it also allows us to fish with gear allowed in other areas of the state. Sincerely, Mark Larsen

2020 Board of Fisheries Comment

Mikayla Fisher
Alitak District Set Gillnetter
Proposal 67 – Support

PROPOSAL 67: Allow the use of single filament mesh web in a set gillnet in the Kodiak Area.

I support Proposal 67.

As stated in the proposal, "extreme slime events" have plagued Kodiak set gillnetters. Being limited to multifilament web has been an issue as it is susceptible to capturing and retaining slime, more so than monofilament web.

This affects the cleanliness of the nets. Since dirty nets do not catch fish well they must be cleaned frequently. Increased slime retention as seen with multifilament web requires more passes with the pressure washer over the web to get it clean. Washing the web more frequently shortens the lifespan of the net. This translates to more frequent repairs and replacements over a short period of time which increases gear costs.

Allowing the use of single filament mesh (a.k.a. monofilament) gillnet gear in the Kodiak Area allows each gillnetter the opportunity to pursue new avenues to offset the cost associated with net building and repair, optimizing their operation to ultimately fit their specific needs.

Naomi Hall

12/27/2019 09:34 PM AKST

RE: PROPOSAL 67 Allow the use of single filament mesh web in a set gillnet in the Kodiak Area

My name is Naomi Hall, my husband and I setnet in Uganik Bay, I am writing in favor of proposal 67. Salmon set gillnetting is already a lot of work, I'll be the first person to admit that. The heavy slime events that occurred in 2017 and 2018 completely shut down our ability to catch fish and resulted in significantly more work as we tried futilely to keep our nets clean with the hope of catching a few fish. The slime was so thick and stuck in the net by the time you got done washing and went back to where you started it looked like you hadn't done anything, making it hard to not feel defeated and wonder why we were leaving our net in the water. Aside from the hope that one day it would finally go away and there would be a few fish. The ocean is changing, and no one knows what is coming from one year to the next as we experience record setting surface temperatures. Implementing this proposal would give setnetters a tool to use during slime events to help keep our gear fishing more effectively.

Northwest Setnetters Association
P.O. Box 870
Kodiak, AK 99615

December 21, 2019

Alaska Board of Fisheries
Reed Morisky, Chair
Attn: Glen Haight, Executive Director
1255 W 8th Street
P.O. Box 115526
Juneau, AK 99811-5526

RE: Approval of proposal 67

Dear Chairman Morisky and members of the Board of Fisheries,

Thank you for the opportunity to comment on proposal 67 in advance of the Board meeting. This proposal was put forth by the Northwest Setnetters Association (NWSA) and we request you approve this proposal. Our organization and its members have identified an area of concern we feel needs some attention within the Kodiak Management Area (KMA) with growing climate variability. We have deliberated this proposal idea within our organization, we have had discussions with the Department of Fish and Game, and we have voted unanimously within our Association to put forth this proposal.

Northwest Setnetters Association is comprised of over 100 active SO4K permit holders and crewmembers of which the vast majority have been family run operations for many years and passed down to family members through the generations. The majority of these permit holders in the Northwest District maintain a residence on Kodiak Island and contribute to the economics of Kodiak. Recently, the viability of our setnet fishery has increasingly become more difficult to maintain and we are approaching a situation of survival as a fishery.

Proposal 67 requests the allowance of the use of single filament mesh web. In recent years we have experienced severe slime events which have effectively shut down our fishery and is backed up by harvest data from Fish & Game (see attached graph). In early August 2017, represented on the attached graph, you will notice there was something that drastically reduced the catching ability of gillnets in the areas listed. This was directly correlated to a slime event experienced in these areas during this timeframe. There was an additional dramatic slime event in August of 2018 which occurred at the peak of the fishing season for many Westside setnetters. Some setnetters went from peak harvest days of the season to NOTHING in a matter of 2 days due to heavy slime on set nets. We also have numerous pictures available to you for reference of our struggles (a few pictures are attached to this comment). We feel single filament mesh may allow our nets to fish effectively, even during heavy slime events, which appear to be more frequent each year. Additionally, this type of gillnet will wash easier with our pressure washer pumps and remain clean a little longer than our multi-strand web, which seems to grab and hold onto the slime. We can wash our multi-strand web spotless and within 15 minutes or less, during slime events, the gear becomes

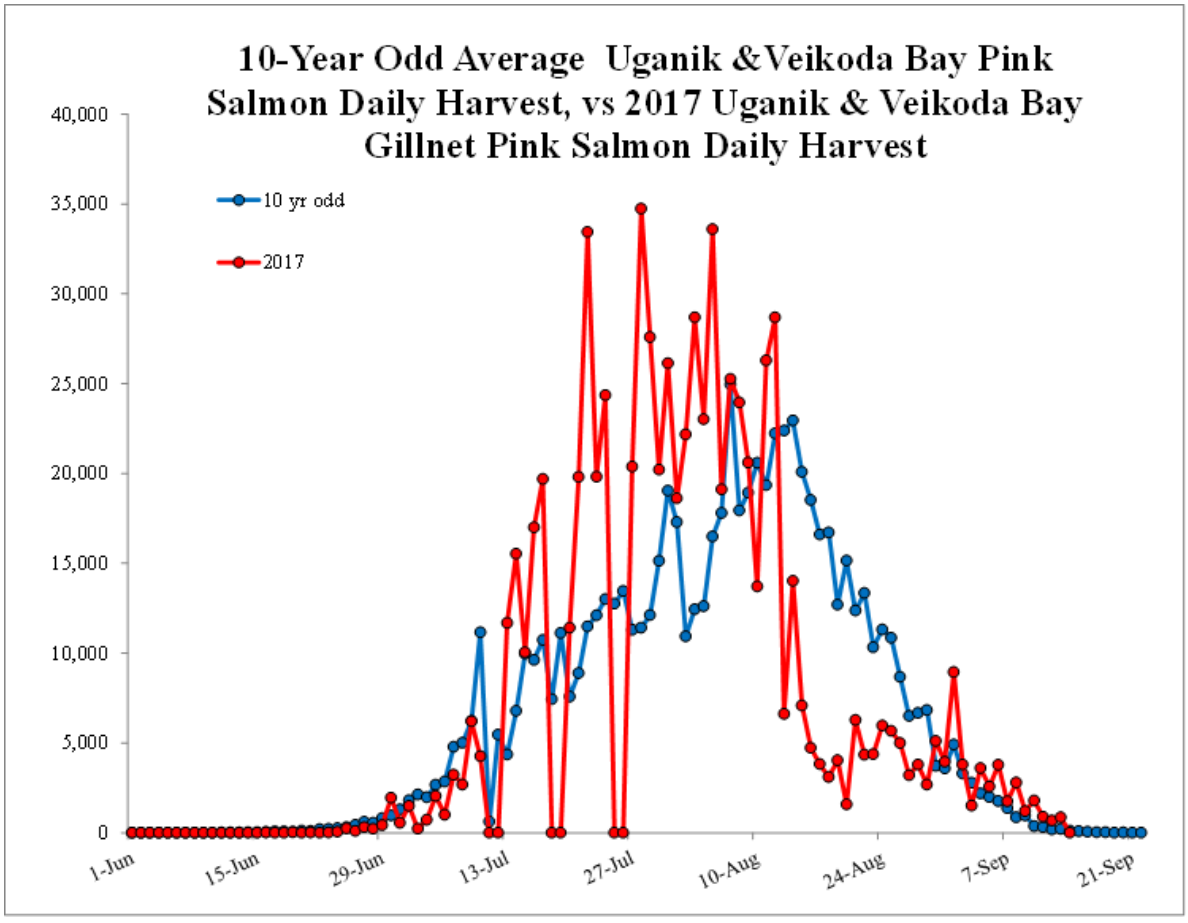
useless, as well as set lines breaking, due to the extreme drag the slime creates. Please consider approving this proposal to allow our fleet a gear alternative. This type of web is currently legal in Cook Inlet and provides us an alternative option during an ever-growing slime problem with rising ocean temperatures. After discussions at the Kodiak AC, this proposal was supported with 1disenting vote voicing concerns that setnet fishermen may be able to catch more pink salmon with the new web.

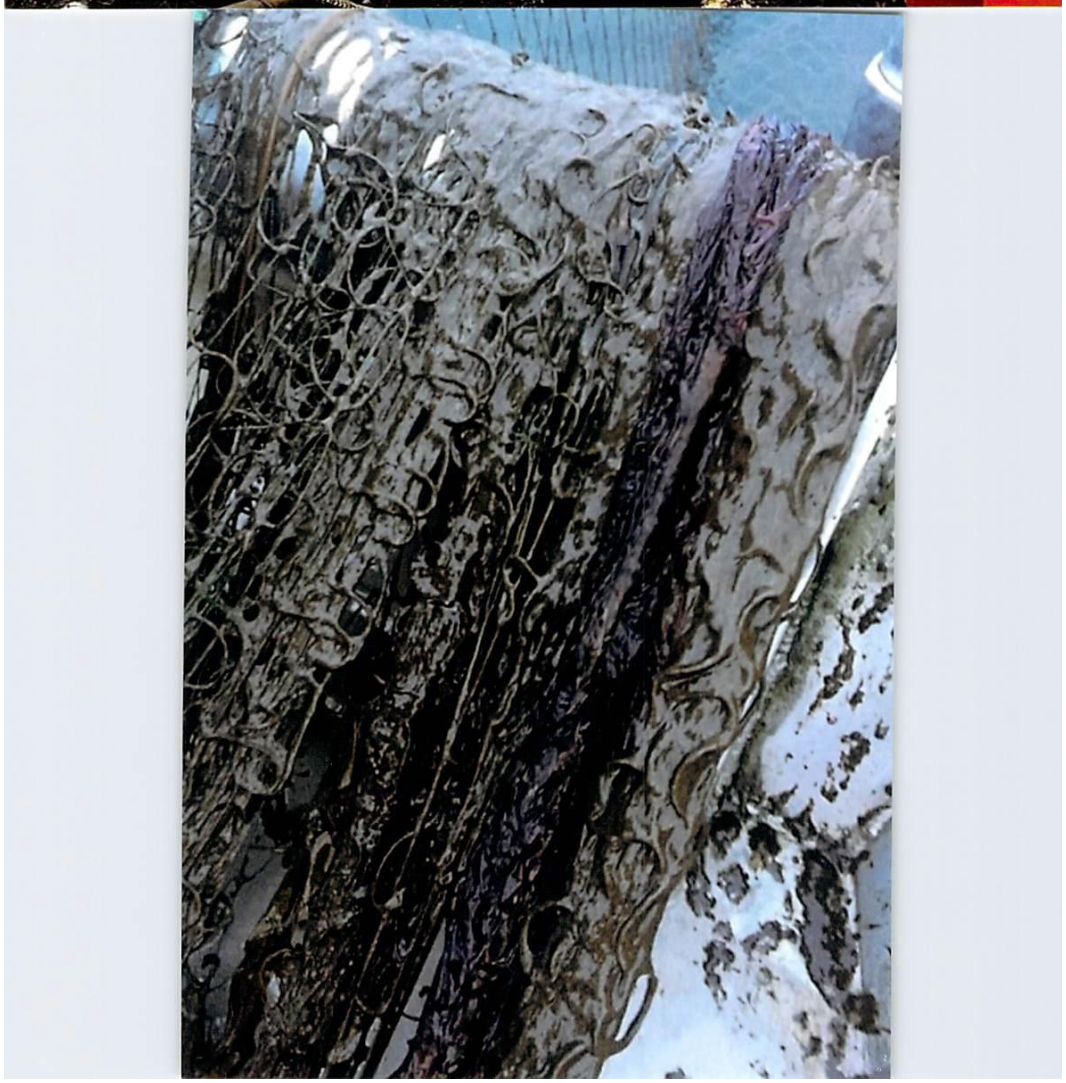
NWSA, after speaking with Kodiak Area salmon biologists at Fish & Game, received 4 Commissioner subsistence permits to test single filament in the 2019 season. Although we did not have any significant slime events, there was a new and different bright green mossy growth that was very difficult to remove from our nets. We were able to test the web and it did appear to be easier to clean.

This proposal will provide setnetters one additional tool to continue to pursue their livelihoods in a historic fishery for Kodiak families and future generations during an everchanging environment. We respectfully ask the Board to approve proposal 67.

Sincerely,

Mark Beardsley
President - Northwest Setnetters Association





Peter Danelski Jr.

12/28/2019 12:19 AM AKST

RE: PROPOSAL 67 Allow the use of single filament mesh web in a set gillnet in the Kodiak Area

I support allowing the use of monofilament gillnet in the Kodiak setnet fishery. I grew up setnetting on the west side of Kodiak, and my kids have started to participate too. They are the third generation. From a technological perspective we have not innovated much in the 30 years I have been fishing. Besides proper gloves, and roller skiffs, the high power pressure washer is our biggest breakthrough….and we use it FREQUENTLY - Often every pick through the gear when loose kelp and algae SLIME is present. Large blooms of algae have gotten more frequent. When we see the SLIME in the water column we know our catch is going down, and our work and use of resources is going up. When it's really bad, the reprieve from slime is very short lived even when we have pressure washers going. Our hope is that the smaller surface area of the single strand vs. 6 strand gillnet will be faster to clean and stay clean longer. Less trouble with SLIME will mean higher morale for crew and a greater likelihood of skilled crewmen returning. It would also mean less fuel and pollution as pressure washer time diminishes and we spend less time running around the nets. From firsthand knowledge from others, it sounds like monofilament gillnet, with it's lower strength, would not be suitable for everyday fishing, but in large SLIME events, it would be a tool we could use to help get by. Thank you for considering this proposal.

Rich Blanc
High Rock Fisheries
12/27/2019 05:38 PM AKST

RE: PROPOSAL 67 Allow the use of single filament mesh web in a set gillnet in the Kodiak Area

A lot of the time our nets look like chain link fences when the algae/slime builds up on them. A single use filament will be easier to maintain with a pressure washer and algae/slime will not be able to adhere to the net as easily as a multi strand net.

Sam Haughey

12/27/2019 11:04 PM AKST

RE: PROPOSAL 67 Allow the use of single filament mesh web in a set gillnet in the Kodiak Area

I support this proposal because it helps fisherman be productive in a changing ocean environment. We don't know what will happen in the future with the water temperature and all the effects it will have on the fish, and use of monofilament can ensure a more consistent production during these heavy algae cycles.

Thomas G Wischer
Northwest Setnetters Association
12/21/2019 06:57 PM AKST

RE: PROPOSAL 67 Allow the use of single filament mesh web in a set gillnet in the Kodiak Area

I have been a Kodiak gill net fishermen for 42 seasons in the same location. Our fishery has essentially remained unchanged with the exception of aluminum roller skiffs and bigger outboards. We have seen our percentage of the island wide harvest be eroded over time as the seine fleet has modernized and become much more efficient. That combined with the unrepresented ocean slime events in recent years, have further restricted our ability to harvest salmon needed to sustain our family businesses. Single filament mesh web has been shown to resist these slime events better and cleans up easier, thus allowing us to keep our gear in the water for the limited time we are allowed. This proposal would give gill net fishermen another tool to sustain the fishing opportunities we have. It has been allowed in other regions in the state and is a needed supplement to our current regulations.

Tollef Monson

12/25/2019 06:24 PM AKST

RE: PROPOSAL 67 Allow the use of single filament mesh web in a set gillnet in the Kodiak Area

I was one of the testers for the mono web in Uganik Bay, Kodiak 2019. I found it to be easier to clean slime from mono strand than multi strand web. I also found it had better resistance to slime adhering to it. This will be another tool in the tool box that help us manage a growing problem. I also think it will be tougher and keep used web out of the landfill. Thank you.

Virginia Adams
Northwest Setnetters Assoc
12/26/2019 10:02 AM AKST

RE: PROPOSAL 67 Allow the use of single filament mesh web in a set gillnet in the Kodiak Area

My name is Virginia Adams. I have fished my salmon set net site on Uganik Island, Kodiak for 40 years. Before fishing in Alaska I was a commercial gillnetter out of Montauk, NY. There I fished single filament gillnets in set nets as well as drift nets. I am very familiar with single filament, or commonly called mono filament,, as well as the multi strand we are required by law to fish presently in Kodiak. Set nets in Kodiak are experiencing extreme slime events over the past several years. It is my belief that single filament nets will be much easier to keep clean during these events. Our fishing essentially stops completely during these slime events. In 2018 we were in the height of our season when within 48 hours we were catching nothing, this lasted for almost 2 weeks, essentially losing our season. If we were able to fish single filament during these events there is a chance we could keep our nets fishing more efficiently. I believe the Board should allow Kodiak set netters the use of single filament mesh web, as they have done in Cook Inlet. This additional option will help Kodiak set netters stay viable during increasing slime and algae events which appear to be much more common with warming waters.

Charles and Theresa Peterson
1850 Three Sisters Way
Kodiak, AK 99615

December 26, 2019

Chairman Reed Moriskey
Alaska Board of Fisheries
Board Support Section
P.O. Box 115526
Juneau, AK 99811-5526

RE**: Support Proposal 68**

Dear Chairman Morisky and Board of Fish members:

We moved to Kodiak in the 1980's to pursue the opportunity for a livelihood in commercial fishing. We found what we were looking for, a chance to make a living off the sea and stayed, raising three children and developing deep relationships in our island home. Kodiak is a community built on fish and the size of the fleet, the processing infrastructure, the support services and the overall health of our coastal community is dependent on sustainable fisheries. Salmon fishing is the mainstay of our commercial fishing business and without it we would not have the financial means to stay in Kodiak, maintain a vessel and prosecute other fisheries. We own a 42', shallow draft seine vessel that primarily operates in the Alitak district. Our son now runs the boat and Charles and I run a setnet site in Alitak Bay. We choose to diversify our salmon fishing with participation in both the seine and setnet fishery so our son can run the boat with his crew and the rest of the family can prosecute the fishery from a shore-based operation.

We support proposal 68 and see the chance to setnet in seine only areas after September 4th as a small but potentially meaningful opportunity for the South End based setnet fleet. We respected the sunset provision as an important step to determine if gear conflicts may arise between user groups and there have been no conflicts identified that we are aware of. Our setnet camp was the only site to utilize the provision and it did not amount to much. However, given the status of the South end setnet fleet and diminished fishing time and harvest opportunity, every day and each chance to catch fish is important. We support the regulatory lines restricting any set net activity outside the capes, such as Alitak beach as it was important to the seine fleet to reduce the potential of lost anchors in historical seine sets.

Sincerely,

Charles and Theresa Peterson

Corina Watt, Kodiak Setnet Salmon Fisherman
Trap Pt/ Moser Bay Fisheries: Alitak District with sites across Olga, Moser and Alitak Bays
12/25/2019 10:07 PM AKST

RE: PROPOSAL 68 Repeal the sunset date for the use of commercial set gillnets in the Alitak District

I support proposal 68: to 5 AAC 18.330. Gear. Repeal the sunset date for the use of commercial set gillnets in the Alitak District, for the following reasons: 1) Allows Alitak District Setnet fishers an opportunity to regain lost harvest on Alitak District systems due to current management restrictions prior to Sept 4th. 2) Affords harvest of local Alitak stocks/systems by Alitak setnet fishers with little or no impact to the health and sustainability of Alitak salmon systems. 3) Having been trialed during the 2017-18 Setnet salmon seasons there were no apparent gear conflicts.

Ed Fisher, Kodiak Setnet Commercial Salmon Fisherman
Trap Pt/ Moser Bay Fisheries
12/25/2019 10:49 PM AKST

RE: PROPOSAL 68 Repeal the sunset date for the use of commercial set gillnets in the Alitak District

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Judy Fisher, Kodiak Setnet Commercial Salmon Fisherman
Trap Pt / Moser Bay Fisheries
12/25/2019 10:52 PM AKST

RE: PROPOSAL 68 Repeal the sunset date for the use of commercial set gillnets in the Alitak District

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Kevin Fisher
Alitak District Setnet Fisherman
12/27/2019 08:33 PM AKST

RE: PROPOSAL 68 Repeal the sunset date for the use of commercial set gillnets in the Alitak District

I believe this proposal is going to help some fishermen in the Alitak district. It has not caused any problems or conflicts and as such has no reason to sunset

2020 Board of Fisheries Comment

Mikayla Fisher
Alitak District Set Gillnetter
Proposal 68 – Support

PROPOSAL 68: Repeal the sunset date for the use of commercial set gillnets in the Alitak District

I support Proposal 68.

Both the actual harvest as well as the projected harvest in the Alitak District have been steadily declining. This can be seen in the tables and graphs below. This obvious decline causes financial strain for set gillnet fishermen that return each year to the Alitak District.

One of the underlying factors contributing to the dramatic decline in seasonal yields is a lack of opportunity. Repealing the sunset date for the commercial set gillnets in the Alitak District will help alleviate the issue of opportunity. It will provide the set gillnetters, with the resolve and capability to do so, an opportunity to attempt recapturing season losses caused by outstanding restrictions.

Typically, the salmon season in the Alitak District is coming to a close by September 4th and accordingly minimal effort has been put forth by seiner or gillnetter during this period. To the best of my knowledge, no gear conflicts have occurred since this opportunity was provided via the 2016 Board of Fish cycle.

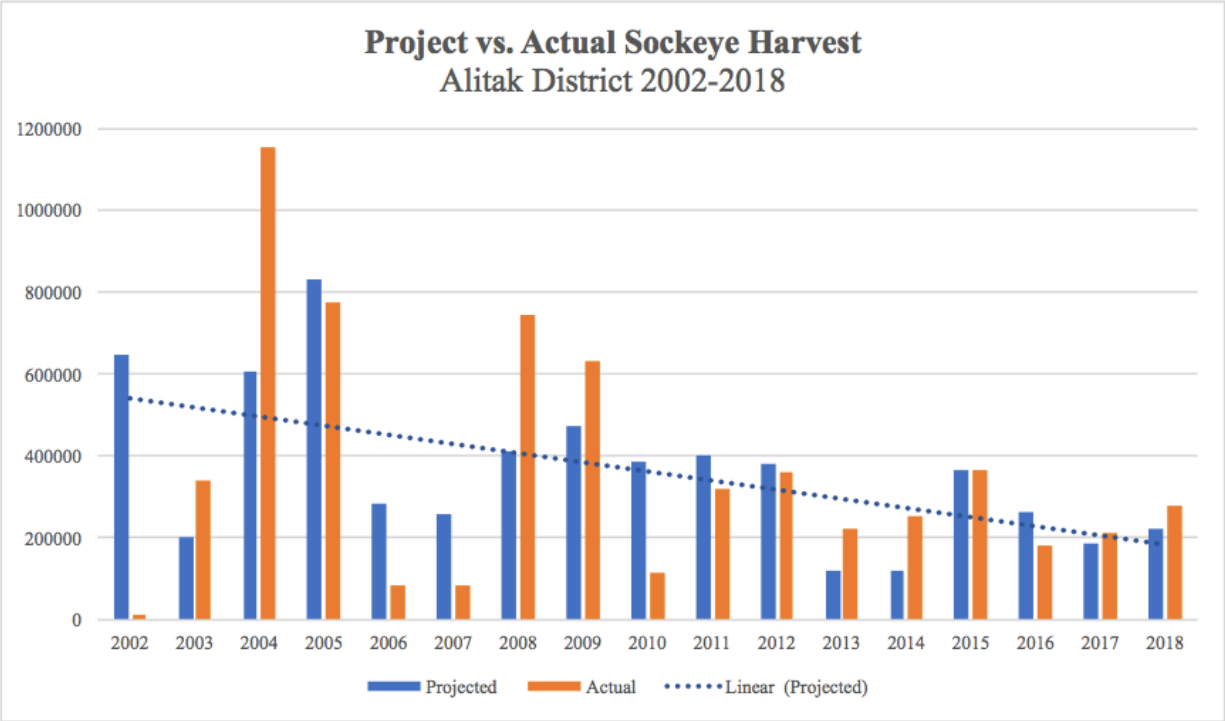
Alitak District Sockeye Harvest: Table 1 & Graph 1

Table 1 shows the decline in both project and actual sockeye harvest in the Alitak District. The discrepancy between the projected and actual harvest is also evident. Numbers represent the number of fish (not pounds).

Alitak District Sockeye Harvest		
Year	**Projected**	**Actual**
2002	648,000	14,600
2003	204,000	341,400
2004	605,000	1,157,000
2005	831,000	777,817
2006	286,000	86,286
2007	259,000	85,469
2008	412,000	743,052
2009	474,000	631,312
2010	389,000	115,938
2011	401,824	318,208
2012	383,331	359,890
2013	117,962	222,154
2014	117,962	254,600
2015	364,330	364,946
2016	262,000	183,295
2017	189,000	214,898
2018	223,000	277,528

Table 1. Alitak District Projected & Actual Sockeye Harvest. Data taken from Kodiak Area Management Harvest Strategies.

The blue dotted line is a linear trendline for the projected harvest of sockeye in the Alitak District. As you can see, the projections for Alitak District sockeye harvest have been declining.



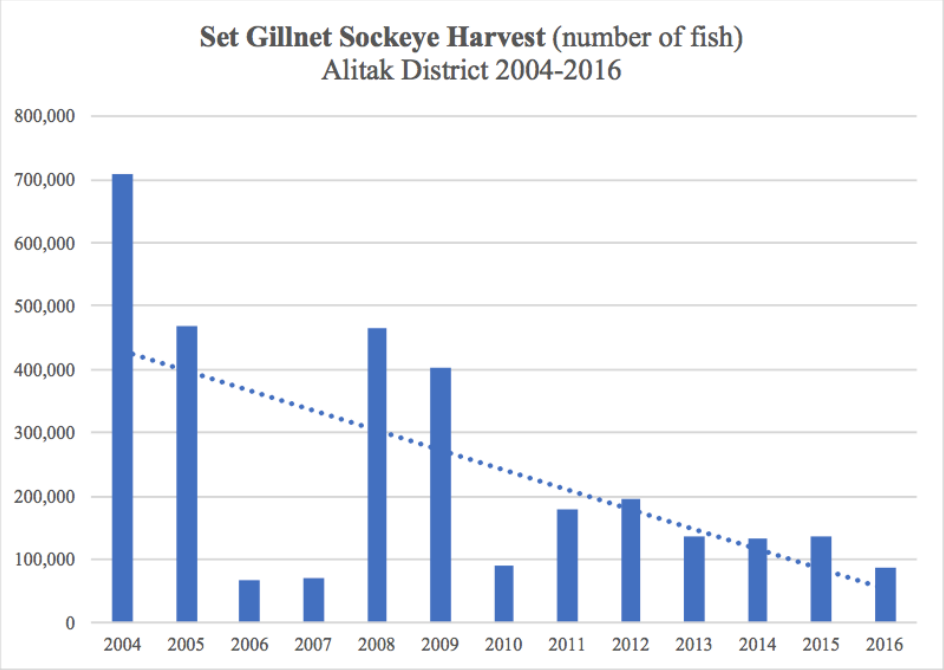
Graph 1. Alitak District Projected & Actual Sockeye Harvest.
Data taken from Table 1.

Alitak District *Set Gillnet* Sockeye Harvest: Table 2 & Graph 2

The decline in set gillnet harvest specifically can be observed in both Table 2 and Graph 2.

Set Gillnet Sockeye Harvest	
Year	**Harvest** (number of fish)
2004	708,411
2005	469,511
2006	65,322
2007	68,640
2008	465,314
2009	402,400
2010	91,397
2011	178,186
2012	193,994
2013	134,758
2014	133,082
2015	136,487
2016	85,628

Table 2. Alitak District Set Gillnet Sockeye Harvest. Data taken from Kodiak Management Area Commercial Salmon Fishery Annual Management Reports.



Graph 2. Alitak District Set Gillnet Sockeye Harvest. Data taken from Table 2.

Rich Blanc
High Rock Fisheries
12/27/2019 05:40 PM AKST

RE: PROPOSAL 68 Repeal the sunset date for the use of commercial set gillnets in the Alitak District

This proposal would allow additional fishing opportunity to the already financially depleted set gillnet fishermen in the Alitak District.