Submitted By
John Love
Submitted On
10/3/2018 8:56:11 PM
Affiliation
Commercial Fisherman area E permit holder

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John Love

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October 3, 2018

Dear Chairman Jensen and Board of Fisheries members,

I am in opposition of ACR 1 and ACR 2. The hatcheries are well managed. There is no reason to threaten the local economy and livelihoods of so many on an assumption. A decision like this should come from sound scientific research. Please vote no on ACR 1 and ACR 2

Sincerely,

John Love

Submitted By
Justin Peeler
Submitted On
10/3/2018 9:43:58 PM
Affiliation
Commercial Fishermen

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Justin Peeler

F/V Defiant

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October 03, 2018

Alaska Board of Fisheries

October 15-16, 2018

Work Session

RE: Comments on ACR 1, ACR 2 and ACR 10

Dear Chairman Jensen and Board of Fish Members,

As a second-generation Fishermen from Petersburg Alaska I have been involved in the salmon, herring, and crab fisheries in Southeast Alaska all my life. As well as many other net, pot, and hook fisheries on the West Coast and Gulf of Alaska. I currently own and operate the F/V Defiant out of Petersburg, Alaska and reside in Sitka, Alaska.

I currently serve my communities and fellow salmon seiners as the President of the Board of Directors of Northern Southeast Regional Aquaculture Association, I also hold the northern seine seat on the Joint Regional Planning Team. I am involved with Southeast Alaska Seiners Association as an officer on the board and a United Fisherman of Alaska Alternate.

I am writing to express my opinion only on:

Opposition to ACR 1-

I believe this is an attempt to circumnavigate the system in place by the State of Alaska as this group has done twice already with very

similar proposals. Those were voted down as it should this time. As I stated above I am involved in the process and I know the great lengths the State of Alaska and our regional aquaculture associations go to, to insure the safety of our wild stocks. Therefore, I believe this ACR does not meet criteria for an out of cycle proposal.

Opposition to ACR 2-

As I stated above, I am involved in the process and in my years of being involved sitting through many meetings and talking to the men and women that came before me; I have never heard of any agreement, cap or reduction of fry production by our PNP Hatcheries. Not one fishermen, ADF&G Biologist, or a Board of Fish member has ever said one thing, about said, “protocol”. This ACR should be thrown out on the fact said, “protocol” does not exist.

Please listen to ADF&G, as they help to educate you on the process in which are PNP’s operate in, the studies and the scientific information, they are using to manage and protect Alaska Wild stocks.

Finally, by taking any action besides rejection, you are disrupting coastal Alaska as we know it. The fishermen invested in something to create more than a living for them but a stable financial environment for all in the coastal communities around Alaska. An environment that other supportive industries to fishing have been built on and that financial institutions can operate in with stability. This is bigger than one man’s increase in catch. This is something that has been built to stabilize coastal communities. Fishermen took the risk to invest in that stability by taxing themselves to create more fish for them and the communities around them. More fish for all users while protecting our wild stocks!

Opposition to ACR 10-

This ACR is not one you need an introduction to or education on. It should simply be dismissed as it does not meet criteria. The information ADF&G will present to you will prove this. There is not a biological reason for it. Please continue to manage our fisheries on sound science and let the Alaska department of Fish and Game do so and not an outside interest! The outcome of our fishery is being bent to imply a biological problem; it was industry and the department that ended the fishery and not lack of fish or spawn.

In closing I would like to thank you for your service to the State of Alaska.

Sincerely,

Justin Peeler

From: Kas Huffman
To: DFG, BOF Comments (DFG sponsored)
Subject: Comments
Date: Wednesday, October 3, 2018 3:35:17 PM

I really hope this reduction gets stopped in its tracks. Alaska can have enough resources to provide satisfactory amounts of fish for all areas that need them—commercial, sport, and subsistence. I do not think a reduction in hatchery production and demanding the destruction of eggs already harvested is going to have any benefit. Commercial fishing is not going anywhere in Alaska, and to try to get rid of it is asinine. Especially through trying to starve the fishermen by cutting hatchery production. My entire family relies on our commercial fishing income, which is modest at best. A 25% reduction would greatly hurt us.

I truly hope this issue is resolved in a way that does not cut any hatchery production in any way—like I said, commercial fishing is not going anywhere in Alaska and it's counterproductive to try to fight it.

Thank you for your consideration,

Kasandra Huffman
Prince William Sound Purse Seiner And Drift Gillnetter

Submitted By
Kenneth Carlson
Submitted On
10/2/2018 9:16:45 PM
Affiliation

I am a commercial fisherman. I fish the Copper River and Prince William sound. Most of the fish I catch are Hatchery fish. I see no reason to limit Hatchery production. Alaska salmon fisheries, including the hatchery program, continue to be certified as sustainable by two separate programs, Responsible Fisheries Management (RFM) and Marine Stewardship Council (MSC)

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Alaska Board of Fisheries
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October 3, 2018

TO: Members of the Alaska Board of Fisheries

RE: ACR 1, ACR2, Alaska Salmon Hatcheries Forum

Thank you for the opportunity to provide comment related to Alaska Salmon Hatchery production and the ACRs submitted for consideration at this October, 2018 work session. Kodiak Regional Aquaculture Association is opposed to ACR 1 submitted by Kenai River Sportfishing Association (KRSA) and ACR 2 submitted by Virgil Umphenour. In the simplest context, both requests fail to meet criteria established for ACR consideration and should not be entertained by the Board for discussion or action in future meetings. More specifically, contentions made by the proposers are weak against the broad body of evidence that can be brought to bear in support of established programs, permitting, and production levels.

As an association actively engaged in the practice of salmon enhancement and research, KRAA would also like to thank the Board for its renewed interest in the *Alaska Board of Fisheries and Alaska Department of Fish & Game Joint Protocol on Salmon Enhancement #2002-FB-215*. We feel that the years in which this protocol was not observed have led to a lack of knowledge and uncertainty in the science and principles that support Alaska Salmon Hatchery production. Renewed adherence to this protocol provides opportunity to become familiar with the science, research, and regulatory structure that governs the Alaska Salmon Hatchery Programs. Furthermore, through this format, there is opportunity to share with the Board, as well as the public, the details of our programs, research, and the ways in which they benefit all user groups.

The Board of Fish has scheduled an Alaska Salmon Hatchery Forum (item 16, Alaska Board of Fisheries Work Session agenda, rev. 09-28-2018) for discussion as part of the regularly scheduled October work session. As such, KRAA believes the language of the *Joint Protocol on Salmon Enhancement* does not provide for consideration of hatchery-related petitions or ACRs as action items during those meetings. The protocol states:

> *"The joint department-board meeting on hatchery [sic] described here will take place at a mutually agreeable time and place during regularly scheduled meetings of the board. The meetings will provide a forum for open discussion on a mutually agreeable agenda of hatchery topics. The agenda may include site-specific as well as regional or statewide hatchery issues. These salmon enhancement meetings will not be open for regulatory actions and no hatchery-related petitions or agenda change requests (ACRs) will be considered as action items."*

Given this language and the scheduling of Alaska Salmon Hatchery Reports (item 15) as well as the Alaska Salmon Hatcheries Forum the day following ACR discussion, it would be premature to consider any action related to hatcheries prior to thorough engagement in the *Joint Protocol on Salmon Enhancement*.

Alaska's private, non-profit hatchery (PNP) associations are designed to serve the various regions of the state with programs uniquely tailored to complement and enhance existing production and benefit all user groups. The Alaska Hatchery Program was founded by visionary scientists at ADF&G and in the private sector who saw an opportunity to bolster the fishery with long-term salmon enhancement contributions. Those individuals applied their knowledge of hatchery programs in other areas of the country to create a program based on the precautionary approach and best available science. In the years since the creation of the PNP program by the Alaska Legislature, Hatchery Operators have continued to conduct those programs in cooperation with ADF&G, in good faith, and based on the tenets of the Department's guidance and policies—including the genetics policy and the policy for sustainable salmon fisheries. We see our role as stewards of the resource and contributors to our communities for the benefit of all users. As such, we do not often find ourselves pulled into the public center of battles over fish. The events of the last several months, the repeated demands by a small number of very vocal critics to the Board of Fish to take unfounded action to limit hatchery production, have forced PNP operators as well as the Board of Fisheries and countless stakeholders, to invest inordinate time and resources in what should be a non-issue.

Rather than create uncertainty in the defensibility of the Alaska Hatchery Program, the efforts of detractors have galvanized hatchery operators to take action, to make sure that the Board and the public understand the science of the programs and the benefits that accrue to all users as a result of hatchery production in Alaska. It has given us the opportunity to work together and with others to marshal the scientific information available, and work together to demonstrate both how critically important hatchery production can be to the fishery as well as how sustainable those contributions remain in a changing climate. In addition to the individual comments of myself and other PNP hatchery operators, I hope you will take note of the supplemental information provided by our groups.

The current ACRs generally imply that Alaska Hatchery Programs operate in an unregulated vacuum with irresponsible levels of production that have seen no checks or balances along the way. In fact, the established permitting process and authority delegated to ADF&G provides for rigorous scientific review and recommendations by professional biologists familiar with the programs, regulations, guiding policies and science on both a local and statewide scale. Though it has been implied by critics in recent months, the existing permitting process *does not* equate to a "rubber stamp" for permit requests. In each region there are examples of permit requests or projects that have failed to receive the recommendation of the Regional Planning Teams or that have been modified in response to application of the genetics policy and the policy for sustainable salmon fisheries. When the process is working properly, PNP hatchery operators work with their local ADF&G staff in order to assure requests for permit alteration are vetted in a manner that answers many of the basic concerns before the request is submitted. Added concerns can be voiced and taken into account through the public process, but it's often the case that many potential requests are discarded before they ever see the light of day because ADF&G staff can point to concerns related to genetics, protection of wild stocks, and provisions of the sustainable salmon policy. The process is comprehensive, transparent, efficient, and thorough.

The department's function as an objective scientific and regulatory body also provides opportunity to identify questions and information gaps related to hatchery production on a regional and statewide scale. The Hatchery-Wild Interaction study is a prime example of both the department's and the Alaska hatchery operators' commitment to inquiry and investigation of the questions surrounding possible impacts of straying. As with any long-term program or policy, what appear to be anomalous incidents and one-off sampling events should not be allowed to drive program management. Careful, unbiased inquiry, application of sound science in the consideration and development of programs, and adherence to established best practices represents both the current approach of ADF&G in regulating the Alaska Hatchery Program and the commitments of the hatchery operators.

Along with the commitment to sound science and research on hatchery topics, Alaska's PNP programs are dedicated to the communities and user groups they serve. Enhancement programs provide a measure of stability to the fisheries in each region, offsetting years of poor production and giving permit holders added opportunity in more abundant years. Opportunity on enhanced fish spreads out fishing effort and serves the purpose of reduced pressure on naturally spawning runs. In a given year, hatchery terminal areas and associated districts ideally give managers a place to direct permit holders and other users during closures, and hatchery operators often put the needs of those users first. For example, KRAA pink salmon production typically represents between 10% and 25% of the pink salmon harvest in the Kodiak Management Area. Following the disastrous impacts of the warm water "blob" in the Gulf of Alaska and the 2016 pink salmon failure, KRAA's Board of Directors made the decision to forego a pink salmon cost recovery fishery at Kitoi Bay Hatchery in 2018. With a higher than expected return to the facility and in the absence of a cost recovery fishery, KRAA put more than 3.2 million additional fish into the common property fishery. That figure, though not "massive" by any measure of the average pink salmon fishery, represents over 50% of the pink salmon harvest in the KMA in 2018. It could be the difference between breaking even and a disastrous year for many permit holders. This is the function for which the enhancement programs were designed. In 2018, Kodiak enhancement programs put over $6.5 million in estimated ex-vessel value into the hands of permit holders in the KMA alone. Hatchery programs statewide made similar and even greater differences for the permit holders in other regions.

However, benefit to commercial permit holders, processors and crews are not the only purposes of the hatchery programs. In 2018 the local subsistence sockeye and sport coho system in Kodiak, the Buskin Lake and river system, has all but failed. At the same time, KRAA's sockeye stocking projects in Port Lions, and Ouzinkie, and the coho stocking project on the Kodiak Road System have provided numerous opportunities for sport and subsistence that directly benefit these local communities. Thousands of coho salmon in Mill Bay and Monashka Bay have been caught by everyone from anglers standing on the beach to stand-up paddle boarders, locals interested in filling their freezers, and professional sport fishing charter operators. These are the programs most likely to suffer the greatest impacts in the face of any restrictions, caps, or moratoriums on hatchery production, and I would again encourage you to refrain from entertaining any such restrictions when engagement in the *Joint Protocol on Salmon Enhancement* will do much to answer both the generalities and specifics of questions related to hatchery interactions and production levels.

Restrictions to hatchery production, caps or moratoriums on future production would not take into account the interests or needs of a region. Taking steps to implement such restrictions would be both needlessly punitive in the face of no demonstrated harm and no empirical evidence to suggest long term impacts. Further, restrictions now would likely have unintended negative consequences for the Associations and for all user groups. In closing, KRAA would repeat our opposition to ACR 1 and ACR 2 and provide specific points to address those proposals in the pages following. Finally, once again, we encourage interest and engagement in the *Joint Protocol on Salmon Enhancement* and look forward to sharing the success story of the state's salmon enhancement programs through that process.

Sincerely,

Tina Fairbanks
Executive Director
Kodiak Regional Aquaculture Association

Submitted via email: dfg.bof.comments@alaska.gov

ACR 1: Prohibit Valdez Fisheries Development Association from incubating, rearing, and releasing pink salmon resulting from additional egg take capacity permitted in 2018 and cap egg take capacity at the level permitted in 2017 (5 AAC 24.366). Submitted by Kenai River Sportfishing Association

PERMITTING:

- The permit increase in question was covered in-depth in comments submitted for the July Meeting related to the identical emergency petition submitted by the same proposer.
- The permit increase in question was approved as an incremental increase in 2014—more than 4 years ago. It underwent thorough review and consideration by ADF&G.
- The permit increase in question was not approved as originally submitted but was revised to the satisfaction of the Department and the Commissioner for implementation in 2018.
- Authority over hatchery permitting has been delegated to ADF&G since inception of the programs. The regulatory process for permitting is transparent, rigorous, and should stand.
- ADF&G maintains the staff and expertise to evaluate and permit hatchery operations, and added steps to permitting and regulatory oversight would be unnecessarily burdensome and inefficient.
- The ACR does not meet criteria for consideration. This is verified by ADF&G staff comments (RC2) in which they submit 1) there is no fishery conservation purpose; 2) no error in regulation is addressed; and 3) the ACR does not address an effect of a regulation that was unforeseen at the time the regulation was adopted.

STRAYING CONCERNS

- Concerns over straying are both integral to the assumptions and knowledge on which the programs were built (not unforeseen) and also in the process of intensive study through the Hatchery-Wild Interaction study (HWI). This effort addresses (c) (1) (D) of the Sustainable Salmon Policy to address interactions between wild and enhanced salmon.
- Protection of wild stocks: preliminary findings of the HWI indicate that harvest rate of hatchery returns of pink salmon to PWS from 2013-2015 ranged from 95-99% (including broodstock) while harvest of naturally spawning stocks ranged from 26-53% during those years (State of Alaska Hatchery Research Project, Progress Synopsis, June 2018). Given this information, management appears to have the ability to assure near-to-full capture of hatchery production (an intended benefit of the programs) and provide for the protection and robust escapement of local wild stocks.
- Region-wide pink salmon hatchery fractions in PWS from 2013-2015 were calculated as 4%, 15% and 10% respectively. The stray rate during those years was 1-5% (hatchery pink salmon that spawned naturally.
- Studies on natural stray rates for pink and chum salmon have generated estimates of 4-7% (Mortensen, et al, 2004) while others have provided estimates of 10% or greater (Small, et al, 2009; Wetheimer, et al, 2000 as well as other, earlier studies). These studies demonstrate natural stray rates equal to or in excess of those observed in PWS from 2013-2015.
- The locus of the straying concern cited by the proposer, Lower Cook Inlet, is centered on data that was opportunistically collected in 2017 and do not represent sampling distribution throughout the run. Baseline sampling has not been conducted in many of the 2017 sampling locations because it is rare for pink salmon to be present in those

locations. 2017 provided anomalous conditions that likely led to the high incidence of PWS fish.

FOOD COMPETITON/OCEAN CARRYING CAPICITY

- With regard to food competition concerns cited by the proposers, the large body of work collected and reviewed by the North Pacific Anadromous Fish Commission provides extensive information related to biomass of pink salmon in the North Pacific Ocean. Ruggerone, 2018, indicates that hatchery-produced pink salmon represent only 15% of the total pink salmon biomass in the North Pacific. Alaska's Hatchery programs produce only a portion of that percentage.
- To suggest that "massive releases" of Alaska Hatchery pink salmon, in competition with sockeye and King salmon for food resources, are suppressing returns of those other species is not a claim supported by empirical evidence. Sockeye and king salmon returns have varied in productivity independent of relatively consistent hatchery production from the early 1990s through the present.
- For a summary analysis of information, see "High Ocean Biomass of Salmon and Trends in Alaska Salmon in a Changing Climate" by Alex Wertheimer and William Heard as submitted with comments from NSRAA.

ACR 2: Cap statewide private non-profit salmon hatchery eggtake capacity at 75% of the level permitted in 2000 (5 AAC 40.XXX). Submitted by Virgil Umphenour

HISTORY/MERITS

- The ACR does not meet the criteria and makes no effort to do so in writing. There is no conservation issue conveyed or supported in this ACR. No regulatory issue or unforeseen regulatory effect on a fishery is identified.
- The ACR claims there was agreement to reduce hatchery production by 25% in February of 2001; however there appears to be no official record of a decision or direction to reduce or cap production.
- This ACR if accepted for consideration or if implemented is likely to have unintended negative consequences. As written, this ACR applies to all species and would likely have the greatest impacts on projects designed to have direct benefits to sport and subsistence users.

SPORT AND SUBSISTENC IMPACTS

- KRAA's Subsistence and Sportfish production is provided at no cost to users. All costs are subsidized through Salmon Enhancement Tax collected from commercial salmon permit holders and through cost recover activities.
- Programs impacted:
    - Crescent Lake sockeye and coho stocking projects (subsistence and sport) with direct benefit to the village of Port Lions would likely cease—unsupportable with reduced production
    - Ouzinkie Sockeye saltwater net pen sockeye release and Katmai Lake coho stocking projects (subsistence and sport) would likely cease—not permitted in 2001
    - Telrod Cove sockeye saltwater net pens with benefit to the village of Larsen Bay (subsistence and commercial) would cease—not permitted in 2001

- King salmon product (sportfish, cooperative project with ADF&G)—loss of production, likely unsupportable
- Coho Salmon Production, Kodiak Road system (sportfish)—loss of production, not permitted in 2001
- Rainbow Trout (sportfish, cooperative project with ADF&G)—loss of production, likely unsupportable
- Kitoi Bay hatchery coho (sport and commercial benefit)—likely 45% reduction in returns
- Kitoi Bay Hatchery Sockeye production (subsistence and commercial)—reduction in production, potential loss of program

COMMERCIAL IMPACTS

- Impacts to production of pink, chum, and sockeye salmon: Overall potential loss of over $5 million annually in ex-vessel value
  - Pink salmon releases would decrease by over 35%, and, on average, the fishery would lose nearly 3 million fish on an annual basis.
  - At 2018 prices, that would constitute a potential **loss of $3.5 million in ex-vessel value** to the common property fishery annually
  - Chum salmon releases would decrease by over 30%, and, on average, the fishery would lose as many as 200,000 fish on an annual basis
  - At 2018 prices, that would constitute a potential **loss of $714,000 in ex-vessel** value to the common property fishery annually
  - Reductions in sockeye salmon production at Kitoi Bay and Pillar Creek Hatcheries would result in potential loss of over 150,000 adult sockeye salmon per year
  - At 2018 prices, that would constitute a potential **loss of over $1 million in ex-vessel** value to the common property fishery annually

ECONOMIC/ORGANIZATONAL IMPACTS

- Enhancement provides stability and opportunity to the fishery; Supports reliable processing capacity and processing sector jobs as well as other support industries
- Generate added income for municipalities and local governments through landing tax on enhanced harvest
- Direct and indirect employment: KRAA employs 40-45 individuals per year with total payroll in excess of $1.8 million annually. This likely equates to effects on over 400 local jobs.
- Reductions in production would likely mean loss of 8-12 positions (5 year-round, 3-7 seasonal positions) for KRAA
- Reduced production would decrease cost-benefit of programs. Many may become unsupportable.
- KRAA spends over $1 million annually with local vendors and Alaskan companies
- Even with organizational cuts and efficiencies, cost recovery activities would consume a greater proportion of the returns and benefit to users.

Submitted By
Nathaniel Rose
Submitted On
10/3/2018 4:20:36 PM
Affiliation
Kodiak Seiners Association

Kodiak Seiners Association

PO Box 8835

Kodiak AK, 99615

October 1, 2018

Chairman John Jensen

Alaska Board of Fisheries

Boards Support Section

P.O. Box 115526

Juneau, AK 99811-5526

RE: KRSA Agenda change request #1, and Virgil Umphenour's agenda change request #2 concerning Alaska Hatchery Programs

Dear Chairman Jensen and Board of Fish members:

The Kodiak Seiners Association is adamantly opposed to the agenda change requests put forth by Kenai River Sportfishing Association and Mr. Virgil Umphenour concerning production and release of pink salmon eggs resulting from additional egg take capacities. KSA supports the Alaska Hatchery Program and the sound science that governs the hatchery permitting process, and we feel the claims made in the ACR's aforementioned are based on opinion rather than sound scientific reasoning.

Foremost, it should be noted that ACR #1 has been visited by the Board of Fish twice as an emergency petition and in both cases was voted down. The audacity of the proposer is an abuse of the BOF process and a waste of the Board's time.

ACR #2 does not meet the criteria of an agenda change request as it lacks any supporting data to support the claim of a conservation concern. Secondly, ACR #2 does not attempt to correct an error in a regulation, or correct an effect on a fishery that was unforeseen when a regulation was adopted. As the ACR does not meet the guidelines, we respectfully ask that you reject it.

We, the Kodiak Seiners Association are an advocacy group representing 83 active Kodiak Salmon Seine fisherman. Our membership has built business plans and family fishing operations around the historical fishing patterns in the Kodiak management area, and see the local hatcheries here in Kodiak, Kitoi Bay Hatchery, and Pillar Creek Hatchery as vital components and contributors of our complex salmon management plan. The governing body for these hatcheries, Kodiak Regional Aquaculture Association (KRAA) has done a tremendous job taking all stakeholders into account when conducting hatchery operations, and hatchery expansion through increased egg takes and request for additional permitting is done with all user groups in mind.

The ACR's put forth and under question, show a lack of understanding of the economic value of the Alaska Hatchery Program. As it relates to Kodiak, and to the members of KSA, hatchery produced pink salmon contributed to over 53% of the total pink salmon harvest in the Kodiak management area in 2018. This correlates to an ex-vessel value in 2018 of roughly $6.5 million dollars. On a year where many of the smaller, wild-stock systems struggled to meet escapement this return of hatchery produced salmon allowed a vast number of

individuals in the Kodiak fleet to offset a poor start to the season. In addition, as a result of the disaster harvest of pink salmon in 2016 and the prediction of a mediocre to poor return in 2018, KRAA elected not to take cost recovery during the 2018 season in order to allow the fleet to harvest more fish and allow access to areas often closed during peak pink salmon fishing time.

It is our opinion that these ACR's hold no merit in claims of scientific reasoning. The VFDA egg take increase was allowed through a permit that was approved in 2014 through an established and transparent permitting process, in direct discussion and review by ADFG, and providing opportunity for public comment and stakeholder input. To revoke this permit, or require VFDA to terminate operations of the additional eggs is a knee-jerk reaction to unsubstantiated and irrational claims.

In closing we ask once again that the Board reject both ACR #1 and ACR#2. Thank you for your consideration in this matter.

Sincerely,

Nate Rose

KSA President

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Anchorage, AK 99503

October 3, 2018

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

RE: Agenda Change Requests 1 and 2

Dear Chairman Jensen,

Koniag is a regional Alaska Native Corporation formed under the terms of the Alaska Native Claims Settlement Act of 1971. Koniag has approximately 4,000 Alutiiq Shareholders. Our region encompasses the Kodiak Archipelago in the Gulf of Alaska and a portion of the Alaska Peninsula. The communities in our region have traditionally been dependent on fisheries resources for subsistence and commercial purposes for centuries. Koniag has been working diligently on issues affecting the viability and sustainability of the village communities of the Kodiak Archipelago and access to fisheries is a critical component of this effort.

It has come to our attention that the Board of Fisheries (BoF) has received Agenda Change Requests (ACRs) to (1) prohibit Valdez Fisheries Development Association from taking additional eggs from pink salmon and (2) capping statewide private non-profit salmon hatchery egg take capacity. Koniag is opposed to these propositions in particular and, in general, is opposed to the Board of Fisheries taking up matters out of cycle unless the ACR meets the criteria mandated for ACRs. With eleven ACR's on the BoF's upcoming agenda, Koniag is concerned that managing fisheries through ACR not become standard practice. The process of considering each fishery management area in three-year cycles has worked for years and there is no reason to change that process.

The salmon fishermen, processors and communities of Kodiak Island benefit greatly from the State of Alaska salmon hatchery program. Alaska's salmon hatchery program has operated for 45 years and supplements wild salmon harvests throughout the state. Alaska's salmon hatchery program is an example of sustainable economic development that directly benefits subsistence fishermen, personal use fishermen, sport fishermen, charter fishermen, commercial fishermen, seafood processors, as well as state and local governments, which receive fishery business fish tax revenue.

Alaska's salmon hatchery program employs strong scientific methodology and is built upon precautionary principles and sustainable fisheries policies to protect wild salmon populations. The Alaska Department of Fish and Game regulates hatchery operations, production, and permitting

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Anchorage, AK 99503

through a transparent public process and multi-stakeholder development of annual management plans. Returns of hatchery and wild salmon stocks follow similar survival trends over time and the largest returns of both hatchery and wild salmon stocks have largely occurred since hatchery returns began in about 1980. There are no stocks of concern where most hatchery production occurs, indicating that adequate escapements to wild stock systems are being met in these areas over time.

Alaska hatcheries contributed an annual average of nearly 67 million fish to Alaska's commercial fisheries in the past decade and account for 22% of the total common property commercial catch. In 2018, approximately 3.2 million or 53% of the 6 million pink salmon harvested in the Kodiak management area were produced by the Kodiak Regional Aquaculture Association (KRAA). The preliminary ex-vessel value of the Kodiak hatchery pink salmon in 2018 is estimated to be approximately $4.7 million. KRAA production results in over 3 million dollars annually in ex-vessel value on average, contributing significant economic benefits to local user groups, municipalities, and businesses. The economic contributions of KRAA to the Kodiak management area resulted in 43 jobs, $1.8 million in labor income, and almost $1 million in total economic output in 2017.

Alaska's salmon hatchery program has proven to be significant and vital to Alaska's seafood and sportfish industries by creating employment and economic opportunities throughout the state and in particular in rural coastal communities. Alaska's salmon hatchery program is non-profit and self-funded through cost recovery and enhancement taxes on the resource and is a model partnership between private and public entities. The State of Alaska has significant investment in Alaska's salmon hatchery program and associated research to provide for stable salmon harvests and to bolster the economies of coastal communities while maintaining a wild stock escapement priority. Alaska salmon fisheries, including the hatchery program, continue to be certified as sustainable by two separate programs, Responsible Fisheries Management (RFM) and Marine Stewardship Council (MSC).

Koniag affirms its support for Alaska's salmon hatchery programs and also supports unbiased and scientific methods to assess the interaction of Alaska's salmon hatchery programs with natural salmon stocks. Koniag requests the Alaska Board of Fisheries work with the hatchery community, the Alaska Department of Fish and Game and industry leaders to further its understanding of the importance of the Alaska salmon hatchery program to all Alaskans.

Sincerely,

Shauna Hegna
President

koniag.com
P (907) 561-2668
F (907) 562-5258

Submitted By
Leroy Cabana
Submitted On
9/26/2018 12:09:30 PM
Affiliation
Commercial Fisherman

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Address
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Alaska Board of Fisheries Members

Here are my comments on ACR 1 and ACR 2

ACR 1 starts out with "the magnitude of releases of hatchery pink salmon in PWS poses a threat to wild stocks of salmon in the gulf of Alaska". The ACR declares this like it is a proven fact. it is not a fact, it is a suspicion, a theory or better yet a question.There has been references from a couple of research papers that support this theory. In todays world there are mountains of research papers, many of them by highly recognized educated people, and many of those research papers directly contradict research papers from equally highly recognized educated people. Facts sometimes get mixed up with the desire to prove personal theories as a fact. Here is a fact, pink salmon are known to have an approximately two year life cycle or this fact, pink salmon can not survive out of water for more than a few minutes without dying, these are facts. You can conduct an experiment and conclude this is a fact.

The assertion that hatchery pinks from PWS are negatively affecting salmon from the gulf of Alaska is a suspision from some folks whom would like a simple answer as to why some king salmon stocks are returning in low numbers to spawn. There is likely no simple answer, halibut for example have experienced a dramatic decline from the peak biomass observed in the 1990s. Halibut have also decreased in size by about 40% from historic weight when compared to similar year classes. They have been monitored by the IPHC since 1923 and there is still no clear answer as to why their historic weight has dropped and the biomass declined from 1997 to 2013. The halibut population has been increasaing since 2013.

Another example of dire predictions that seemed to make sense at the time is the population history of the Porcupine caribou herd being affected by the Alyeska pipeline construction and operations. In the late 1960s and early 1970s the non stop predictions were almost unanimous from the enviromental and northern Alaska native groups the Porcupine herd would suffer large declines from the pipeline activity. They had numerous written research papers from leading biologist and advocates declaring they knew for a fact the pipeline would be detrimental and cause the herd to decline or even collapse. The herd was estimated in population at 102,000 animals in 1972, by 1979 the herd was estimated at 105,000 animals. Many were still declaring the pipeline was going to cause large declines in the herds population. It turns out the population has been rising since 1972, it was estimated at 178,000 in 1989 which was a peak. It fell to 160,000 animals in 1992 and has been increasing since then and is currently estimated at 218,000 animals.

The point of using the halibut and caribou histories is to point out people whom have strong opinions and really believe they are in possession of facts are many times wrong.

There is an ongoing multi million dollar hatchery study be currently conducted that started in 2011 and is expected to continue through 2023, this study is focused on three issues.

1. To document the dregree to which hatchery pink and chum salmon stray.

2. Assess the range of intraannual variability in the straying rates.

3. Determine the effects of hatchery fish spawning with wild populations.

This study is the most far reaching, in depth and expensive ever in the world. It has some of the most accredited scientific and biological minds at work, the study is being overseen by the ADF&G and should shed some insight on the effects of hatchery raised salmon in Alaska. This is science at work, will the study prove absolute effects of hatchery salmon on wild populations? Yes and no is the answer, it will be the best effort ever conducted to better understand hatchery and wild salmon population interactions. It would at least give us the best information at the time to help guide future increases or decreases in hatchery production permitting in Alaska.

There is an entire industry in Alaska that has grown with the enhanced salmon programs that started in the mid 1970s. As hatcheries were built by the state of Alaska and production started to increase, the fishermen in those areas began to gear up for this opportunity, as did the processors, tenders and transportation companies. By the 1990s the state had given up almost all the salmon hatcheries to the non profit hatchery entities. Millions were spent upgrading and building new hatcheries. Literally thousands of Alaska families depend on the hatchery raised salmon for a living.If you add up the investment of new processing plants, fishermen upgrading their vessels or buying new ones there is hundreds of millions of dollars invested not to mention the dependency these folks have on a stable salmon fishery that

produces hatchery salmon.

If it turns out the ongoing salmon study and other future scientific research projects conclude the hatchery salmon are detrimental to the wild salmon runs in Alaska there will be action taken by the governors office, the legislature or ADF&G to correct this. It will require much study and mountians of documention. It would seem a hasty decision by 7 members of the BOF to make this kind of decision with a few research papers and a couple of groups of people whom seemed to figured this complicated question out absent any legitimate independent study or process.

In conclusion I would like to share an old joke that is common in scientific circles, it goes like this.

A scientist (not the brightest) decided to test the difference it made for a frog to jump when you remove his legs. The scientist first documents the frogs jumping ability with all limbs, he sits the frog on the floor and says jump. The frog jumps 4 feet, next the scientist removes a front limb, he repeats the test by sitting the frog on the floor and saying jump, the frog jumps 3 feet. The scientist continues to repete this everytime he removes a limb and the frog is documented to jump a shorter distance after each limb removal. At last all limbs are removed, the scientist sits the frog on the floor and says jump, the frog dosen't move at all. Huhhh says the scientist, who would thought a frog would go deaf by removing his limbs. He shared his finding with his scientific friends and they conducted the same experiment and all concluded a frog goes deaf when all his limbs are removed.Then a new scientist comes along and declares the true reason the frog dosen't jump is because he has no legs to propel him, the first scientist thinks about this for a minute and answers, just because the frog has no limbs to jump with dosen't prove they don't go deaf when you remove their limbs.

I ask all Board of Fisheries members to please try to sort out what is actually a fact and what is a suspicion or question when considering any changes to hatchery production in Alaka.

Submitted By
Leroy Cabana
Submitted On
9/28/2018 9:59:09 AM
Affiliation
Commercial Fisherman

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In ACR 1 there is a request to hear a proposal to reduce pink salmon egg take at the Valdez hatchery. This hatchery and all the returning salmon it produces are harvested in PWS. Any request to change an egg take by a PWS located hatchery should be by the regular process of submitting a proposal during the PWS BOF cycle. The last PWS BOF cycle was in April of 2018 and all proposals that affected PWS salmon fisheries were heard. PWS stakeholders are completely unaware of this out of cycle request, they have written off any proposals for PWS until the next PWS cycle. To move this proposal to Anchorage where few will know or comment or show up is an attempt to pull a fast one.

KRSA was at the 2018 BOF meeting in Valdez, they had several representatives there dealing with issues they care about. KRSA is no newbie in the BOF process, they fully understand the proposal deadlines and requirements. If this issue was so important they could have subbmitted a proposal for the 2018 PWS cycle. As far as I can tell, all the 2019 BOF meetings will be held in Anchorage, this would mean the ACR would be approved in Anchorage and the proposal would be voted on in Anchorage. There is a reason the BOF meetings in each area are held as close to the stakeholders local communities as practible. So the affected parties in that area can have a presence, a voice and have personal contact with BOF members. Anchorage is not PWS.

KRSA claims they have to submit an ARC bcause "reviews of hatchery management plans for non profit hatcheries is not included in the regular cycle calls for proposals". This is hogwash, the BOF hears everything folks want to submitt a proposal on in the area that is up for a meeting cycle. A proposal that deals with hatchery egg takes in the area where the BOF cycle is being conducted is the correct place to allow all stakeholders to be represented. The BOF has considered proposals in PWS on everything from regulation changes, gear changes, deciding if airplanes can assist salmon fishermen, areas you can or can not fish, who gets to catch the fish, in short the BOF hears everything that affects salmon harvesting, production, allocation and so on. Any changes to PWS management area hatchery egg takes would also fall into regular BOF cycle PWS meetings.

This does not even come close to an emergency, the 20 million eggs that is being proposed to be denied is a fraction of the current PWS pink egg take. It represents about 4% of the pink eggs taken each year in PWS. A 4% increase is hardly a crisis situation, it is not going to have a meaningful impact on the number of fry released each spring into PWS. Nothing about this ACR passes the test to be considered out of the regular PWS cycle.

Submitted By
Luke Nelson
Submitted On
9/26/2018 7:49:48 AM
Affiliation

Member of the board of fisheries,

I am writing to express my OPPOSITION to ACR1 and ACR2 regarding hatchery production. I work on my dads boat in PWS and hatchery production is important to our fisheries and the state economy. Thank You Luke Nelson

Submitted By
Margaret H Moore
Submitted On
10/3/2018 12:32:53 PM
Affiliation

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PO Box 1646
825 Tasmania W Ct
HOMER, Alaska 99603

I would like to strongly encourage the Alaska Board of Fisheries (BOF) to reject both ACR1 and ACR2 (hatchery production) based on the following three considerations:

1. Both ACR's are based on political self interests without adequate scientific data and do NOT meet the BOF criteria for an ACR:
    1. Scientific data does not exist to prove a conservation concern.
    2. There is no error in regulation.
    3. There is no unforeseen effect on a given fishery. To the contrary – to accept either ACR1 or ACR2 would have definite negative effects on multiple subsistence, personal use, sport and commercial fisheries as well as associated processing and support industries!

The salmon resources provided by Prince William Sound hatcheries benefit subsistence, personal use, sport and commercial users throughout Alaska.The ultimate goal for all Alaskan fisheries is to manage them for sustainability based on proven scientific data rather than politics and emotion.If fisheries management is based on self interest rather than science all users will lose the very resource they depend on!The chum and pink salmon data being gathered through the ongoing 10+year Alaska Hatchery Research Group (AHRG) study should be carefully examined before considering any changes to existing hatchery production.NOTE: Final AHRG conclusions and findings are due in 2020 for pink salmon and 2023 for chum salmon.I urge you to reject ACR1 and ACR2 as they do not fit the ACR criteria and are not based on proven science.

2.When the Board of Fisheries asked for an emergency petition to reduce Valdez hatchery egg take by 20 million, the meetings were held during the summer. The timing absolutely precluded fishing industry input as it was during the middle of the commercial fishing season. It was not reasonable for fishermen and hatchery personnel to forego fishing activities when their families, crew, processors and hatcheries depend on timely harvest of salmon. If the BOF accepts ACR1 and/or ACR2 in October it appears the hearings would be held out of the area that will be affected by these ACR's. The travel, lodging, and meal expenses associated with out of area travel to participate in BOF hearings would place an unfair burden on interested parties who were already disenfranchised by the summer emergency petition meetings. Again, I urge the Board of Fisheries to reject ACR1 and ACR2 based on economic hardship.

1. As I understand it, the Board of Fisheries role is to ensure sustainability of fish returns, establish management regulations of in-season harvest and allocate fishery resources. It is not to establish or manage hatchery production levels. Hatchery production levels are set through a rigorous process with a 40 year history of success. This process ensures that wild stocks and enhanced salmon are managed and protected based on scientific data rather than politics and emotional appeal. The process which starts with the Alaska Dept. of Fish and Game, includes private, public, industry, and community input, goes back to ADF&G for review and then hatchery production levels are ultimately approved or rejected by the Alaska Commissioner of Fish & Game. If there were possibly a proven need to adjust hatchery production it should be addressed through the existing ADF&G process. I do not believe that ACR1 nor ACR2 fall within the scope of the Alaska Board of Fisheries mandates and therefore urge you to reject both ACR's.

I respectfully request the Alaska Board of Fisheries reject ACR1 and ACR2.

Thank you for your careful consideration.

Sincerely,

Margaret H Moore

PO Box 1646

Homer, AK 99603
bottomline.ak@gmail.com

October 2, 2018

Alaska Board of Fisheries

Alaska Department of Fish and Game, Boards Support Section

P.O. Box 115526

Juneau, Alaska 99811-5526

Re: Oppose ACR1, ACR2 and ACR10

Dear Chairmen Jensen and Alaska Board of Fisheries members,

I am a commercial Kodiak salmon seine fisherman and have been running my own boat for 14 years. I have raised my family on the back deck and my youngest son is putting himself through collage from salmon deckhand earnings. I am opposed to ACR's 1, 2, and 10.

ACR1 – Oppose

ACR1 does not meet the requirements for an ACR. This is the third time this issue has been in front of the board since May, not the first as the submitter states. There was two emergency petitions asking to prevent the expanded egg take that were rightfully rejected by the board as recently as July 17th and to ask the board to take up the same issue for the third time in one year is an abuse of the process.

The permit in question was issued four years ago and went through a rigorous scientific review with plenty of opportunity for public engagement through the regional plan team process and there was no public objection through that process.

The reason cited as meeting the criteria for a fishery conservation purpose is the presence of PWS hatchery pink salmon in Lower Cook Inlet in 2017. I assume they are referring to an ADF&G memorandum released on December 1,2017 that is a summary of otolith sampling taken one time late in the season and is not at all designed to be a straying study. The ACR also claims that 15 percent of LCI pink salmon escapement in 2017 was of PWS hatchery origin. There is absolutely no evidence or documentation that corroborates that statement. To do a study to get that kind of data would take sampling in the rivers over the entire run not just one day towards the end of the run.

Given the lack of data that supports a fishery conservation need I don't think ACR1 meets the criteria and I respectfully ask the board to reject it.

ACR2 - Oppose

ACR2 is asking the board to reduce the total egg take from Alaska PNP's by twenty five percent from the 2000 permitted number. The submitter is claiming that there is a need for a fishery conservation

purpose and sights ACR1 as the evidence. The claim in ACR1 is about PWS pink salmon and this ACR takes action against all salmon species in all areas of the state. I will reference my comments to ACR1 and add that no data has been provided about a conservation concern from hatchery salmon species other than pinks or areas other than PSW.

Due to the lack of any scientific data that supports claims of a conservation concern in ACR2 I respectfully ask the board to reject it.

ACR10 - Oppose

ACR10 which is asking to close the Sitka Sound commercial herring fishery was just taken up at the January 11-23 Southeast and Yakutat Finfish & Shellfish meeting and the board spent lots of time going over the management of this fishery. Just because a fishery does not harvest the allowable quota or the subsistence needs were not met does not quorate to a crash of the stocks. It could be as simply as the biomass was not in the areas open to commercial or subsistence harvest and is in no way scientific evidence of a conservation concern. As to the criteria to correct an effect on a fishery that was unforeseen when a regulation was adopted the board has spent hours listing to public testimony both written and oral about the indigenous/traditional ecological knowledge about herring. I would like to believe that members of the Alaska Board of Fisheries listen to and acknowledge the public in their deliberative process. Given that there is no new scientific data proving there is a conservation concern or a valid reason to correct an unforeseen effect of an adopted regulation I respectfully ask the board to reject ACR10.

In conclusion I want to thank you for the opportunity to provide comments on the above ACR's. I also want to thank the board for having an agenda item to take a deep look at the hatchery programs around the state and the science behind them. I feel that the presentations and public engagement will help bring to light the rigorous process and protocols that the ADF&G goes through and adheres to in the states hatchery programs.

Sincerely,

Matthew Alward

Owner-Alward Fisheries LLC

Submitted By
MATT GIAMBRONE
Submitted On
10/3/2018 4:08:34 PM
Affiliation

I am an owner/operator in the SE AK purse seine fishery, hatchery production was responsible for over half of my gross stock this season and was crucial for the fleet as a whole Many of us would not have been able to make our payments without the contribution of hatchery fish.

I urge the board to reject ACR 1 and ACR 2. Alaska fisheries management is a success story the the rest of the world can look to because it is based on science. Science tells us that there is no emergency, the “problems” that these ACRs propose to solve may not even exist. While straying of hatchery salmon may occur there is little evidence that it occurs at a higher rate in hatchery fish than it does in wild stock salmon. This very issue is the subject of a long term multi generational study being conducted by ADF&G (2012-2023). It would be premature for the board to address this issue.

Submitted By
Matt Lukin
Submitted On
10/3/2018 3:38:51 PM
Affiliation

To: Alaska Board of Fisheries

RE: Comments on Hatchery Related ACRs

Dear Chairman Jensen and Board of Fisheries Members,

I am a commercial fisherman from Prince William Sound. I oppose the acceptance of ACR 1 and ACR 2.

ADFG Staff comments regarding these ACRs found no purpose or reason for a conservation concern. The ACRs do not correct an error in regulation. The ACR does not address an effect of a regulation on a fishery that was unforeseen when that regulation was adopted.

For these reasons, ACR1 and ACR2 do not meet the criteria for the Board of Fisheries to accept these Agenda Change Requests.

Additionally, Alaska's salmon hatchery program is integral to the economic sustenance of rural communities. Hatcheries support sport, personal use, susbsistence, charter, and commercial fisheries throughout the state, and provide tax revenues for local and state governments.

The hatchery programs are heavily science-based and decisions regarding hatchery production rely heavily on current data. There are no stocks of concern where most hatchery production occurs and historically, hatchery production has alleviated pressure on wild stocks.

Hatcheries should continue to be overseen by the Regional Planning Teams and ADFG biologists, who know and understand the history of salmon enhancement in Alaska.

Thank you for your consideration.

Signed,

Matt Lukin

Submitted By
Melina Meyer
Submitted On
10/3/2018 9:21:53 PM
Affiliation

Alaska Salmon Hatcheries ACR1 & ACR2

I was born and raised here in Cordova where the whole community depends one way or another on the salmon fishery. Commercial salmon fishery as the economic driver and sport/subsistence to fill our freezers for the winter months. The dependency of salmon in this area goes back thousands of years, it's our way of life.

Alaska's salmon hatchery program is integral to the economic sustenance of rural communities. Hatcheries support sport, personal use, subsistence, charter, and commercial fisheries throughout the state, and provide tax revenues for local and state governments.

The hatchery programs are heavily science-based and decisions regarding hatchery production rely heavily on current data. There are no stocks of concern where most hatchery production occurs and historically, hatchery production has alleviated pressure on wild stocks.

From my understanding the hatcheries are overseen by regional planning teams and ADFG biologists. Oversight for hatchery and wild salmon is key to keep our salmon fishery sustainable for the future.

The ADFG staff comments regarding these ACRs found NO purpose or reason for; fishery conservation, correcting and error in regulation, or correcting an effect on a fishery that was unforeseen when a regulation was adopted.

I would urge you to continue to allow the hatcheries to be overseen by the Regional Planning Teams and ADFG biologists, who know and understand the history of salmon enhancement in Alaska.

Melina Meyer

Submitted By
Michael Bowen
Submitted On
10/1/2018 5:07:23 PM
Affiliation

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Subject: BOF 2018 October Work Session ACR 1 – do not support

I support enhanced salmon. My livelihood heavily depends on a well-managed and fair enhanced salmon program in PWS.

This increase in production at VFDA was approved by the State of Alaska several years ago which allowed VFDA to obtain the needed loans from the State to accommodate the increase in production. To pull the permit now considering the fact of the States approval of the increase and loans would be a disaster.

Not that there is room for improvement. All VFDAs enhanced salmon production has been allocated by the BOF to the PWS seine fleet. The PWS drift and setnet fisherman receive no benefit from VFDA or the planned increase in production.

The Reginal Planning Team process could be improved. BOF regulations are willingly ignored and violated by the RPT in approving PARs. Repeated requests for the RPT to address issues created by their lack of leadership is ignored. Better access to the public notice of the meetings along with the draft agenda, PARs and meeting materials should be readily available on ADF&Gs website and the hatchery operator's website. Requests for added agenda items should not be ignored. The RPT can vote the added agenda item up or down, at least there will be a record of it. Approved minutes from all RPT meetings should be readily available to the public on ADF&Gs website and the hatchery operator's website.

The requirements from the 2002 BOF and ADF&G Joint Protocol on Salmon Enhancement should be observed. A more informed and open/accessible public process could help with the confusion and some public distrust of the enhanced salmon program.

Subject: BOF 2018 Work Session ACR 2 – do not support

More valid information is needed before the BOF starts to consider dismantling or reducing Alaska's enhanced salmon programs.

Of all the economic projects the State has funded, enhanced salmon has been and continues to be one of the most successful investments it has ever made. Most of the projects the state has funded have failed.

The 1990s was a tough time for the whole Alaska salmon industry. And there was plenty of issues to blame it on. From the Exxon Valdez oil spill to the entrance of large-scale farmed salmon on the market place and the issues associated with successful enhanced salmon returns. At times the processors were over whelmed with large returns, the fish turn black and was not fully utilized. Fish prices for all salmon was down to the point that it was very hard to make a living commercial salmon fishing. Some PWS seiners could not find markets and permits were not fished.

But the fishery and industry has come a long way since then. ADF&G and PNP Hatchery's keep improving their management of issues as they develop. Most of the seine permits are now fishing and even drift gillnet fisherman have pink markets. Processors have invested heavily in their plants and markets to effectively handle the returns. All the fish are fully utilized now, even the broodstock carcasses are purchased and used in fish meal. Products other than canned have been developed to broaden the markets for salmon. Fisherman have invested in new vessels and gear. All of this has had a multiplier effect in producing a healthier economy for the State of Alaska.

In 2001 I was the Chairman of the PWS/CR Advisory Committee and a PWSAC board member. I was at the BOF meeting in Anchorage where BOF members Virgil Umphenour and Dr White tried to blame all the ills of the salmon industry on the enhanced salmon program. The half-truths and blatantly false accusations were appalling. Mr. Umphenour's distain for the PWS/CR commercial fishery is well known and documented in BOF testimony. I don't know of any agreement to reduce hatchery production by 25% in 2001. What was agreed upon was that the PNP hatcheries would voluntary reduce the excess permitted capacity on their permits with the caveat that when the fishery was ready they would get the full permitted capacity back. That is exactly what has occurred.

Thank you for this opportunity to testify on these very important issues.

Submitted By
Michael F Durtschi
Submitted On
9/29/2018 10:48:27 AM
Affiliation

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BOF,

I am submitting comments directed toward ACR#1 and ACR#2.

First and foremost, Hatcheries have operated in the State for decades, been productive economic engines and been guided by ADF&G the experts in the field. Any proposals regarding PWS hatcheries should be presented during the normal BOF meeting cycle every three years with all the other proposals, not as an agenda change request mid-cycle.

I and my family commercial fish for Salmon in the PWS area. We are successful, create wealth for the State, and provide employment in our community. Common sense plays a big part in our operation. I emphasize this with my sons as they learn to fish. Looking out the window at what is happening around you is usually the best way to assess what is going on. Here are some common sense, looking out the window observations about PWS Hatcheries.

It is widely accepted that there are three main contributors to the demise of salmon stocks. #1 Polluted water. #2 Over harvesting of a salmon stock. #3 Habitat degradation. In all areas where salmon have diminished or disappeared completely salmon have died a death of a thousand cuts due to one, two or all three of these reasons.

PWS has an abundance of clean cold water.

PWS commercial harvests are monitored on a sustained yield basis meticulously by ADF&G

PWS, fortunately has a large absence of human habitation in or near salmon rearing habitat keeping it pristine, short of extreme weather or geologic occurances.

PWS wild and hatchery returns have never been more healthy and productive than in the past ten years.

In closing, we do not have a problem with hatcheries deminishing wild salmon runs in PWS. It is my hope that the BOF would advise those people and entities wishing to lay the blame for their reduced salmon abundance on PWS, that they look at and clean up their own area first, leaving no stone unturned to maintain a healthy environment for their salmon runs.

Thank you, Mike Durtschi

From: Mike Mickelson
To: DFG, BOF Comments (DFG sponsored)
Subject: ACR 1 &2
Date: Wednesday, October 3, 2018 5:00:26 PM

October 3, 2018
Mike Mickelson
410 Railroad Row Cordova, AK 99574
F/V Mariah, F/V Amy

To: Alaska Board of Fisheries

RE: Comments on Hatchery Related ACRs

Dear Chairmen Jensen and Board of Fisheries Members,

I am a second generation Cordova Commercial Fisherman and I oppose ACR 1 and 2. Both of these proposals are based on conjecture and not science. Currently, the Prince William Sound Science Center is conducting multi year straying study which will help our managers decide how to proceed in future production of hatchery fish. It is premature to make any changes until the results of that study are in.

ADF&G has found no conservation concern that would warrant the language of ACR 1 and ACR 2 being acted upon by the Board of Fisheries. The proper place for discussion of hatchery production is during the regional planning team discussions with ADF&G biologists.

All user groups benefit from hatchery salmon. The sport sector in Valdez provides almost a $7,000,000 impact to local businesses that support the hook and line harvest of hatchery pink and silver salmon. The commercial fishing economic impact is much greater; fish taxes paid by the commercial fleet support hatchery production for all user groups.

Commercial fisherman in Prince William Sound started these hatcheries 45 years ago to alleviate pressures on wild runs. All of the fish in the hatchery systems are native to the Prince William sound region. We have seen strong returns of wild king salmon and silver salmon the last several years and very strong red runs in 2011, 2012, 2013. Also, our wild pink and chum returns in 2017 were some of the biggest on record.

We should continue to use a science based approach to hatchery management. Both ACR 1 and ACR 2 do not meet the criteria for the Board of Fisheries agenda change requests. Both documents cover information that has already been discussed and voted on by the Board of Fisheries recently. There is no new information to warrant reconsideration.

Sincerely,

Mike Mickelson

Sent from my iPad

Submitted By
Nathan widmann
Submitted On
10/3/2018 11:19:05 AM
Affiliation

Date: 10-3-18

Fisherman: Nathan Widmann

Vessel: Orion

Homeport: Cordova

To: Alaska Board of Fisheries

RE: Comments on Hatchery Related ACRs

Dear Chairman Jensen and Board of Fisheries Members,

I am a commercial fisherman from Prince William Sound. I oppose the acceptance of ACR 1 and ACR 2.

ADFG Staff comments regarding these ACRs found no purpose or reason for a conservation concern. The ACRs do not correct an error in regulation. The ACR does not address an effect of a regulation on a fishery that was unforeseen when that regulation was adopted.

For these reasons, ACR1 and ACR2 do not meet the criteria for the Board of Fisheries to accept these Agenda Change Requests.

Additionally, Alaska's salmon hatchery program is integral to the economic sustenance of rural communities. Hatcheries support sport, personal use, susbsistence, charter, and commercial fisheries throughout the state, and provide tax revenues for local and state governments.

The hatchery programs are heavily science-based and decisions regarding hatchery production rely heavily on current data. There are no stocks of concern where most hatchery production occurs and historically, hatchery production has alleviated pressure on wild stocks.

Hatcheries should continue to be overseen by the Regional Planning Teams and ADFG biologists, who know and understand the history of salmon enhancement in Alaska.

Thank you for your consideration.

Signed,

Nathan Widmann

North Pacific Fisheries Association
P.O. Box 796 · Homer, AK · 99603

To: State of Alaska Board of Fisheries October 2, 2018
Re: Opposition to ACR 1, 2, 10
From: Malcolm Milne, President NPFA

Dear Chairman Jensen and Members of the Board of Fisheries,

The North Pacific Fisheries Association (NPFA) was founded in 1955 and represents over sixty Alaskan fishing operations. Almost all of our members participate in Salmon fisheries throughout the state, many in areas that enjoy the benefits of enhanced salmon runs. Additionally many of our members participate in the Southeast herring fishery and depend on it as part of their fishing season. NPFA members include Southeast Herring permit holders, salmon permit holders, vessel owners, tender vessel owners, harvester and tender deckhands. Some of our members have participated for decades and we all support a sustainable fishery for the future. NPFA has a long history of supporting conservative, science based fisheries management and has demonstrated this philosophy by engaging with the regulatory bodies from local to federal and international. We appreciate your consideration of the following comments on selected ACR's before you.

ACR1 - Oppose
NPFA strongly opposes the adoption of this ACR. We concur with the reasoning set forth in the ADF&G Staff Comments (RC2). This issue was addressed at the July 17 BOF Emergency Petition meeting and in our opinion the attempt to revisit this in an ACR is an abuse of the BOF system and procedures. The BOF made a decision and revisiting it in this forum takes a lot of time and energy.

Additionally the ACR sites data claiming to support the statement. *"There is an unacceptable level of straying of pink salmon produced by Prince William Sound hatcheries to areas outside of PWS, in particular Lower Cook Inlet*

Pink salmon that showed up in streams across Lower Cook Inlet in 2017 weren't all local stocks — in some streams, up to 70 percent were releases from PWS hatcheries. PWS hatchery marked fish were present in every Lower Cook Inlet stream sampled. In Fritz Creek, 70 percent of the 96-fish sampled were from PWS hatcheries. In Beluga Slough, 56 percent of the 288-fish sampled were from PWS. In Dogfish Lagoon Creeks, Barabara Creek and Sadie Cove, hatchery pink salmon from the Solomon Gulch Hatchery in PWS composed 34.4, 14.2 and12.5 percent respectively, of fish sampled. Overall, PWS hatchery pink salmon comprised 15 percent of the pink salmon escapement in LCI in 2017.

I assume the ACR refers to a Memorandum released on December 1, 2017 by ADF&G Lower Cook Inlet Finfish Biologists. The memorandum is a summary of otolith sampling and far from a designed study that would substantiate the claim of the ACR. Two of the creeks cited, Beluga Slough and Fritz Creek do not have SEG's or any documented escapement index prior to 2017 that I'm aware of after questioning ADF&G staff. The memorandum cites a "Preliminary 2017 escapement index" of 2000 and 2500 fish respectively for the streams named. This is an insignificant amount of fish and could possibly be one school of Valdez fish straying into Kachemak Bay.

The final statement that 15 percent of the pink salmon escapement in LCI in 2017 has no source cited and I could find absolutely no evidence to support this statement. I'm confident that the BOF will come to a similar conclusion.

The unsubstantiated claims in this ACR undermine its validity and NPFA hopes the BOF does not adopt it.

ACR 2 – Oppose
NPFA strongly opposes the adoption of this ACR. We concur with the reasoning set forth in the ADF&G Staff Comments (RC2). The ADF&G Staff Assessment is that this ACR does not meet the criteria to be adopted and NPFA hopes the BOF agrees. The criteria cited in the ACR "**a)for a fishery conservation purpose or reason:** Yes. See KRSA ACR" I assume this refers to ACR1 which we would reference our comments above.

ACR10 – Oppose
NPFA strongly opposes the adoption of this ACR. We concur with the reasoning set forth in the ADF&G Staff Comments (RC2). The ADF&G Staff Assessment is that this ACR does not meet the criteria to be adopted and NPFA hopes the BOF agrees. The BOF thoroughly examined this issue at the January 11 – 23, 2017 Southeast and Yakutat Finfish & Shellfish Meeting and NPFA's opinion is that revisiting it would be poor use of resources.

In conclusion, NPFA has a long history of supporting sustainable, science based fisheries management. Our members participate in many fisheries throughout the state and depend on salmon hatchery production in varying degrees. What does not vary is our commitment to responsible management and we appreciate that the Board of Fisheries has an agenda item to receive Alaska Hatchery Reports. We are confident that the BOF will make sound, scientific, evidence based decisions going forward.

Respectfully,

G Malcolm Milne
President, North Pacific Fisheries Association

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October 3, 2018

Board of Fisheries
October 15-16, 2018
Work Session Anchorage, Alaska

Re: Oppose ACR 1 & ACR 2 Reductions to Salmon Enhancement Programs

Dear Chairman Jensen and Board of Fish Members:

I respectfully submit comments opposing ACR 1 submitted by KRSA and ACR 2 submitted by Mr. Umphenour.

ACR 1 – this proposal was submitted in a similar form twice in the form of emergency petitions and voted down each time, as it should be this time. As an ACR it fails to meet the necessary criteria for an out of cycle proposal.

The problem statement poses evidence of pink salmon straying. Wild pink salmon are known to stray and likely have the lowest fidelity to natal origin of all salmon; hatchery pinks originate from these same stocks and therefore their genetic makeup is similar, a meta-population if you will, and therefore stray. There is a long-term multi-generation study being conducted by ADF&G 2012-2023 that will inform the very question posed in this ACR. There have been similar studies by Hess et.al. on reproductive fitness of chinook salmon on the Salmon River, a tributary of the Columbia River. These multi-generation pedigree studies showed little difference in reproductive success of wild and hatchery crosses.

The second problem statement of this ACR is 'increased food competition'. This is in the realm of ocean carrying capacity (OCC) and is a relevant scientific question that has been studied for decades by the international organization North Pacific Anadromous Fish Commission (NPAFC) consisting top scientists from the countries – Canada, Japan, Russia, Korea, and the U.S. There is no justification for an emergency, considering that every year from 1988-2018 five billion pink and chum fry have been released by aforementioned countries to the North Pacific Ocean. Twenty million eggs or 18 million fry represent a 0.36% increase in biomass. Furthermore, based on Pauley et.al. (1996) Pacific salmon make up only 7% of the epipelagic fish biomass or 3% when squid are included. A review of the literature attached demonstrates ocean carrying capacity is complex and salmon are a minority in the nektonic competition for zooplankton.

The ACR proposer claims that there is a fishery conservation reason: unacceptable level of straying in Lower Cook Inlet streams.

Many studies demonstrate that pink salmon stray more than any other salmon (Quinn, 1993 and many others). Russian pink salmon have now strayed into Scotland most likely due to Arctic ice melt during the summer months. All of Alaska was recolonized by Pacific salmon after the last ice age due to straying or re-colonization. The extent of straying that occurred in 2017 was anomalous and unfortunate. It appears these late returning pink salmon were pushed into Cook Inlet by strong winds and currents, and they became energy depleted and unable to continue on their journey.

The ADF&G report referenced by the petitioner represents a small sample size and does not truly represent the proportion of stray pink vs natural spawners. The proper sampling protocol requires sampling spawners through the entire spawning run, usually 3 to 4 weeks, rather than a onetime grab sample. Straying salmon generally arrive later to the spawning grounds than returning progeny, as that is the nature of colonizing or straying from home territory. Therefore, a onetime sample late in the run would certainly over-represent the straying proportion. The Hatchery-Wild Investigation for example has a sample protocol that samples the target stream every few days for the entire run, a month-long timing window.

The proposer postulates that PWS pink releases are jeopardizing marine survival of sockeye and Chinook. This is an unproven supposition, more shotgun correlation rather than a necessary cause and effect. There is no evidence that Chinook salmon stocks are negatively influenced by pink salmon abundance. The North Pacific pink and chum, both hatchery and wild have been at a near constant level for two decades, a period with both very high Chinook survival and low Chinook survival. Nearby sockeye in the Copper River do not show a negative correlation or cause and effect with PWS pinks. Bristol Bay, the largest sockeye systems in the world have set record returns in the past five year, just as PWS pink salmon have also set odd-year records.

It is premature to consider this action. The BOF has asked for information at the Work Session and there will be numerous documents and several hours of ADF&G presentations, as well as a forum to discuss and exchange information.

Finally, if ACR 1 is accepted, you will be asking to kill live animals, as these eggs have been taken and are on life support at the Solomon Gulch hatchery.

ACR 2 – This is a draconian measure without merit. There was little effort or thought put into this proposal and it should be rejected.

The problem statement by the proposer gets many things wrong. There was no such agreement with Governor Knowles to cut fry production by 25%, nor is there any document that backs up the erroneous statement. Additionally, there was no moratorium on new production. If there had been such a document or official moratorium there would be a record, and there would not have been increases in salmon fry production. The only document generated from that era is Joint Protocol BOF #2002-FB-215 which the proposer acknowledges in his ACR as –'there is *only* (emphasis mine) the protocol FB-215-2002….." Therefore, it is up to the BOF to consider that protocol which I believe they are now considering by having presentations by ADF&G followed

by an informative forum.

Factors refuting necessity of ACR request:

1. Petitioners state the permitting requirements for a hatchery correctly but omit that these conditions are under the regulatory authority of ADF&G.

2. **AS Sec. 16.10 440(b)** (circa 1979) specifies source and numbers of eggs. This statute refers to the original wild salmon stock and number of eggs that may be taken from a wild donor source. This authority has been delegated to ADF&G, evaluated by local AMB's and granted or denied by ADF&G since 1979. The department develops a 'sliding eggtake' scale based on biological criteria, with the first and most important being adequate wildstock escapement. Second, providing for hatchery development of a brood source. In 1979, there were no large-scale hatchery programs, but rather development of brood sources from local wildstocks. Generally, it took two generations of hatchery releases to obtain large-scale egg takes. Section 16.10.440(b) was thoroughly discussed during the BOF 1999 to 2002 sessions resulting in the Joint Protocol BOF #2002-FB-215.

   Therefore, the number of source eggs is within BOF authority but not number of eggs that are taken from hatchery returns. Established hatchery programs are prevented from going back to the original wild source as delineated in the **Genetics Policy (pg. 4).** http://www.adfg.alaska.gov/fedaidpdfs/fred.geneticspolicy.1985.pdf?_ga=2.149217652.352854699.1530561433-1681060088.1530561433

3. **Joint Protocol #2002-FB-215** – it is true the BOF in 2002 recommended a public forum on hatcheries, but each board makes choices on how to utilize their time and apparently annual public forums did not reach that threshold. To have or not have a public forum on enhancement is a BOF decision, and not within the PNP's authority and therefore had no input into whether such forums were scheduled. The BOF did have annual presentations and reports from ADF&G at BOF meetings both at statewide and area finfish venues. However, lack of a forum in no way makes for an emergency as all subsequent production was permitted through publically noticed regional planning meetings, and fully vetted by numerous ADF&G biologists, managers, and scientists. These meetings are open and attended by members of the public, and often by federal land managers. Public records of RPT meetings are maintained and available.

   The current BOF has decided they want to have a review of the state's enhancement program at the October 2018 work session. The intention of that review is for the board to educate themselves about the program and review the science upon which the enhancement programs are predicated. In addition, the board will see the most recent data on the hatchery/wild research program and NPAFC ocean carrying capacity science. Further, the board has outlined a path for better understanding local enhancement programs by focusing on specific areas during the regularly scheduled regional finfish meetings. The petitioners seem to be attempting to short circuit that public process.

4. **5 AAC 39.222 Natural stock protection** – There is no emergency defined here by the ACRs. Protection of natural stocks is being done via significant policy and regulatory elements of the enhancement program. In addition, the department launched into a massively ambitious research program in 2012 costing $16 million, over two salmon life cycles spanning eleven years.

   Policies and regulations for protection of wild stocks – genetics policy, fish pathology, transport of fish policy, use of local stocks, restrictions on cross-geographic regions, regional salmon enhancement plans, limnology protocols, 100% marking of salmon, management feasibility analyses, and more insure those protections.

   Hatchery Wild Interaction Research – this study will answer the hypothesis: do hatchery strays breeding (introgression) with natural spawners reduce the reproductive success and productivity of the wild spawners? This innovative research employs recent genetic techniques that will be able to establish pedigrees of parents and their offspring for two generations of wild/wild, wild/hatchery, and hatchery/hatchery crosses in four discrete streams in PWS.
   http://www.adfg.alaska.gov/index.cfm?adfg=fishingHatcheriesResearch.findings_updates

   Straying Assessment – some 34 randomly selected ADF&G index streams have been assessed for extent of hatchery straying in PWS. Research results have been presented at American Society of Fisheries in Anchorage, May 2018. Preliminary results were reported in 2016 and 2017
   http://www.adfg.alaska.gov/static/fishing/PDFs/hatcheries/research/2017_annual_report_pwssc_hw.pdf
   Peer reviewed journal articles are expected in press later this year or in early 2019.

   Relevant journal quotes regarding straying:

   Straying is typically defined as adult migration to—and attempted reproduction at—non-natal sites (Quinn1993). In the context of hatcheries and other human interventions, straying is often negatively framed as a‘‘failure to home’’. However, straying in wild populations is a critical evolutionary feature of salmonid biology that compliments homing.

   There have been few studies of chum or pink salmon straying (Fig. 4), but the available data suggest that these species stray at relatively higher rates than other Pacific salmonids or Atlantic salmon (Quinn 1993; Hendry et al. 2004; Pess 2009). Field studies by Sharp et al. (1994), Tallman and Healey (1994), Wertheimer et al. (2000), and Small et al. (2009) all reported straying estimates of[10 % for chum or pink salmon. Reported straying was somewhat lower (*4–7 %) for Alaskan pink salmon in Mortensen et al. (2002), but a relatively small number of nearby sites were sampled for strays in this study. A consistent theme was that relatively unstable habitats across years, in combination with abundant suitable spawning habitat in close proximity to natal sites, allows many chum and pink salmon strays to successfully reproduce (i.e., there is little fitness cost for low philopatry).

5. **Pink salmon eggs and fry released to PWS in 2016** – reporting the numbers of release and returns does not present an emergency, nor is there any rationale presented as to what the stand-alone numbers are supposed to mean. Context would be helpful. Since 1990 about five billion hatchery fry from Japan, Russian, Canada, and the U.S. have been released into the ocean annually. In addition, there are billions of **wild pink fry** from Alaska, Canada, and Russia entering the North Pacific each year. The petitioner's cited number of pink fry (643 million) is 12.9% of five billion. If you included fry from wild systems in Russia, Canada, and U.S. (~20 billion, Heard 1998) the percentage would be much lower.
https://npafc.org/new/publications/Annual%20Report/PDFs/Annual%20Report%202016.pdf

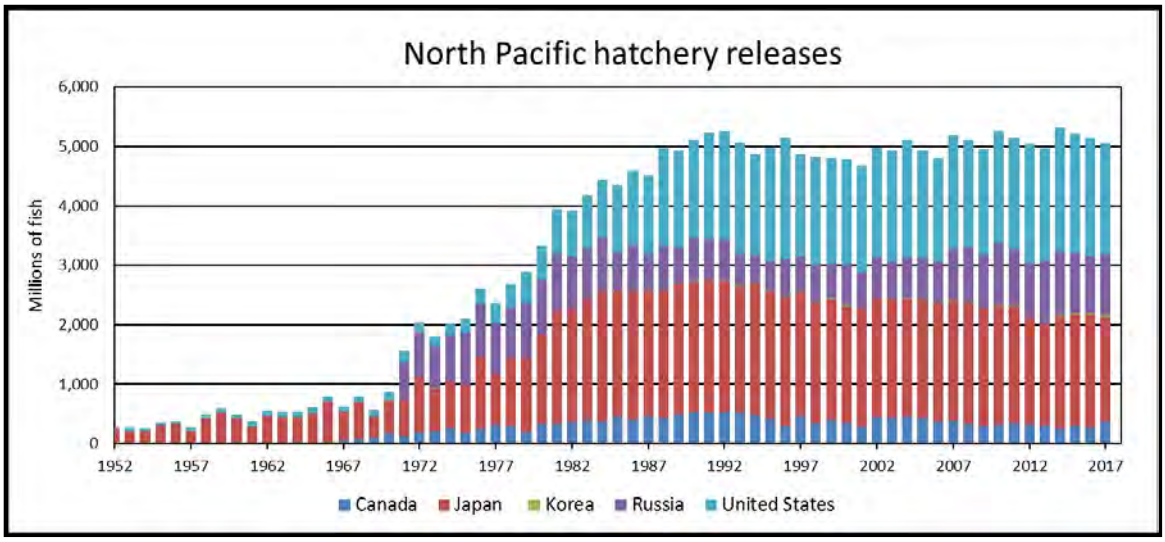

Figure 1. Source: North Pacific Anadromous Fish Commission

Again, in the interest of context for understanding, the permit is for 20 million eggs or 18 million resultant fry, which is 0.36% of the five billion fry from North Pacific Ocean enhancement.

6. **High pink salmon catches in PWS** - The ACR, I suppose inadvertently, points out the specific purpose of the enhancement program – harvest high percentage (up to 92%) of hatchery salmon except for a small proportion that are necessary to perpetuate the program as broodstock. Furthermore, the department manages wildstock harvest of salmon only when the return is in excess to ADF&G escapement requirements. Maximizing enhanced fisheries' harvest and protecting wildstocks from over-exploitation is a State of Alaska mandate. The pink and chum harvest numbers that the petitioner cites are a small proportion of harvests in Russia, Japan, and Canada (see Figure 2).

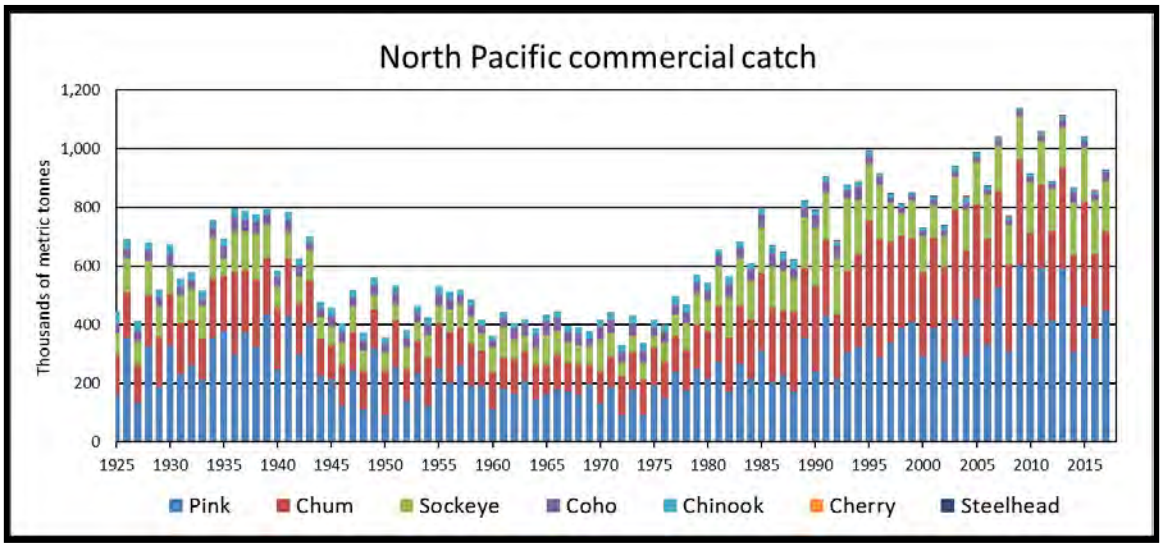

Figure 2. Source: North Pacific Anadromous Fish Commission

Many sport fisheries benefit from the same PNP hatchery programs across the state, including chinook, coho, and chum salmon in S.E. Alaska and pink, sockeye, chinook, and coho in PWS and Cook Inlet. ADF&G has a state of the art $100,000,000.00+ hatchery near downtown Anchorage that produces coho & chinook for the public.

7. **Journal article submissions** – There are nine journal articles presented and each can be debated for scientific rigor and significance. The petitioner does not attempt to explain the significance of each paper but rather throws down a sheaf of documents as if to say it proves something. Some of these journal articles represent good work and even support some of my contentions. For example, Ruggerone and Irvine (2008) document the high-sustained abundance of pink and chum salmon. They show the harvest data for the low harvest era in 1974, 22 million salmon to an average of 177 million from 1990-2015 (Stopha 2018). Based on the discussion, recent changes in abundance, survival, and size of coho and Chinook salmon have NOT been a response to recent changes in aggregate salmon numbers or biomass. These analyses will be submitted in a separate document and are the work of a retired career scientist with National Marine Fisheries Service, PNP biologists, and science panel members. These analyses are critical to understanding the petitioners' cited journal articles.

Please reject ACRs #1 & #2 that would rescind ADF&G's NPA for 20 million VFDA pink eggs. The proposers' fall far short of the BOF criteria. Rather, the board is to be commended for scheduling a hatchery committee meeting at the October work session in order to become more educated on the Alaska's enhancement program. Making an affirmative decision on the petition prior a full vetting of the HWI research and other relevant information would be premature.
Respectfully,

Steve Reifenstuhl
General Manager, Northern Southeast Regional Aquaculture Assoc.

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October 3, 2018

Board of Fisheries
October 15-16, 2018
Work Session Anchorage, Alaska

Re: Joint Protocol on Salmon Enhancement #2002-FB-215 – Prohibitions

Dear Chairman Jensen and Board of Fish Members:

I respectfully submit additional comments opposing ACR 1 and ACR 2 based on the board's Joint Protocol on Salmon Enhancement #2002-FB-215. It states as follows in the Protocol subheading of the document, first paragraph, and fourth sentence:

> "….These salmon enhancement meetings will not be open for regulatory actions and no hatchery-related petitions or agenda change requests (ACRs) will be considered as action items."

In the last paragraph, the document further provides:

> "As appropriate, the board and department may agree to invite other state and federal agencies, professional societies, scientists, or industry spokespersons……"

Based on this passage I would like to highlight that two scientists (retired) with life-long Alaskan careers in National Marine Fisheries Service, who have conducted specific research on ocean carrying capacity and associated elements that inform the topic, and have written a paper "*High Ocean Biomass of Salmon and Trends in Alaska Salmon in a Changing Climate",* which you will find in your public comments. These scientists also fit the profile in the quoted passage above as having lifelong membership in North Pacific Anadromous Fish Commission, American Fisheries Society and collaboration with international scientists from Russia, Japan, Korea, and Canada.

Respectfully,

Steve Reifenstuhl
General Manager, Northern Southeast Regional Aquaculture Assoc.

Alaska Board of Fisheries
and
Alaska Department of Fish and Game

Joint Protocol on Salmon Enhancement

#2002-FB-215

Background: In actions taken in January 2001 and June 2002 the Alaska Board of Fisheries stated its intent to institutionalize a public forum to bring a statewide perspective to issues associated with hatchery production of salmon. Accordingly, the department and board agreed to enter into this joint protocol to coordinate department and board interaction on certain aspects of salmon hatchery policy and regulation.

Authorities: The commissioner of the Department of Fish and Game has exclusive authority to issue permits for the construction and operation of salmon hatcheries. The Board of Fisheries has clear authority to regulate access to returning hatchery salmon and to amend, by regulation, the terms of the hatchery permit relating to the source and number of salmon eggs. The Board of Fisheries' authorities also include the harvest of fish by hatchery operators and the specific locations designated by the department for harvest (see AS 16.10.440(b) and Department of Law memorandum to the board dated November 6, 1997).

Statement of Intent: It is the intention of the commissioner of the Department of Fish and Game and the chairman of the Board of Fisheries that meetings be held on a regular basis wherein the department will update the board and the public on management, production, and research relating to Alaska's salmon enhancement program

Protocol: The joint department-board meeting on hatchery described here will take place at a mutually agreeable time and place during regularly scheduled meetings of the board. The meetings will provide a forum for open discussion on a mutually agreed upon agenda of hatchery topics. The agenda may include site-specific as well as regional or statewide hatchery issues. These salmon enhancement meetings will not be open for regulatory actions and no hatchery-related petitions or agenda change requests (ACRs) will be considered as action items. These meetings are open to the public. At its discretion and upon appropriate notice, the board may open the meeting to public comment.

The hatchery meetings will provide an opportunity for the board and the public to receive reports from the department on hatchery issues including: production trends, management issues, updates on hatchery planning efforts, wild and hatchery stock interactions, biological considerations, and research. Requests for report from the department may be made during the board's work session during meeting years when there is a hatchery forum scheduled.

As appropriate, the board and department may agree to invite other state and federal agencies, professional societies, scientists, or industry spokespersons to attend and to contribute information on particular topics, or sponsor other discussions, such as marketing or intrastate effects.

Dated: June 28, 2002

Ed Dersham, Chairman
Alaska Board of Fisheries

7-3-02

Frank Rue, Commissioner
Alaska Department of Fish and Game

Board of Fisheries
October 15-16, 2018
Work Session Anchorage, Alaska

Dear Chairman Jensen and Board of Fish Members:

In the interest of understanding the complex topic of Ocean Carrying Capacity (OCC) this document written by two career fisheries research scientists is presented.

High Ocean Biomass of Salmon and Trends in Alaska Salmon in a Changing Climate

Alex Wertheimer, NOAA Fisheries Research Biologist (retired)[1]
Fishheads Technical Services

William Heard, NOAA Fisheries Research Biologist (retired)[2]

EXECUTIVE SUMMARY

The abundance and biomass of wild and hatchery pink, sockeye, and chum salmon in the North Pcific Ocean has been higher in the past 2.5 decades (1990-2015) than at any time in the 90-year time series. The high biomass has been remarkably consistent from 1990-2015. There has been higher variability in numbers of salmon than in biomass due to the variability in pink salmon abundance. The high sustained abundance and biomass is driven in no small part by historically high abundance of Alaska salmon, and corresponds with the renaissance of Alaska salmon fisheries from their nadir in the 1970s. Statewide commercial catches of salmon were just 22 million fish in 1973; for 1990-2015, statewide catches have averaged 177 million salmon, an eight-fold increase.

This remarkable recovery and historically high abundance of Alaska salmon can be attributed to five major factors: (1) large expanses of relatively pristine and undeveloped habitats; (2) salmon management policies that have evolved since statehood; (3) the elimination of high seas drift-net fisheries; (4) production from large-scale hatchery programs designed and managed to supplement natural production; and (5) favorable environmental conditions associated with the 1977 “regime shift” affecting the ecosystem dynamics of the North Pacific Ocean. Habitat, management, and enhancement set and maintain the productive capacity that responds to marine environmental conditions: ocean “carrying capacity”.

Carrying capacity has been defined as the ability of an ecosystem to sustain reproduction and normal functioning of a set of organisms. Ocean carrying capacity for Pacific salmon is not a fixed productivity limit, and the considerable regional and temporal variability in salmon stocks is a response to non-homogeneous ocean conditions. Over the past few decades, conditions in the North Pacific Ocean have

been generally favorable to Pacific salmon as reflected by the sustained high abundances and catches. However, extremes in survival and production have occurred both temporally and geographically. Survival and year-class strength of salmon is the result of responses to local, regional, and basin scale conditions. Marine conditions vary geographically and temporally within a given year, interannually, and in the context of oceanographic regimes favorable or unfavorable to salmon production.

There are concerns that the high abundance in the North Pacific Ocean, coupled with high variability in stock performances, indicate that carrying capacity is being exceeded, and that competitive interactions are negatively affecting growth and survival. These concerns have been raised for over 20 years. Rather than indicate that carrying capacity has been exceeded, the trend of the past three decades show that the North Pacific Ocean has had the capacity for the recovery and sustained production of wild stocks while supporting the expansion of large-scale enhancement production from Japan (chum salmon) and Alaska (chum and pink salmon).

A proposed mechanism for negative impacts of high abundance of salmon in the ocean is that their feeding capacity alters the biomass of oceanic zooplankton, and in turn the phytoplankton biomass. In this scenario, this "trophic cascade" and alteration of food webs then negatively impacts other species, including coho and Chinook salmon. The record numbers and abundance of Pacific salmon can appear to be an imposing load on the North Pacific Ocean ecosystem. However, assessments of nektonic trophic structure in the Gulf of Alaska and the western North Pacific Ocean indicate that salmon have low to moderate impacts on oceanic food webs, and they respond to, rather than control, changes in ocean productivity.

Pink salmon have been identified as a keystone predator restructuring oceanic food webs to the detriment of other species. Four lines of evidence call this conclusion into question. First, Russian researchers report that in extensive ocean research programs, they have found typically no significant correlations occur among pink salmon growth rate, stock abundance, or zooplankton standing crop. Second, high numbers of pink salmon in the North Pacific Ocean have been associated with record run sizes and continued sustained biomass of salmon, rather than a reversal in these trends when pink salmon abundance increased. Third, pink salmon have shown the greatest variation in abundance among Alaska salmon, especially in response to anomalous ocean conditions. Thus rather than restructuring the food webs, they appear to be the most sensitive to changes in marine conditions. Finally, the high predation pressure of pink salmon in the context of epipelagic food webs is justified because other species, especially chum and sockeye salmon, switch to other, poorer quality prey items when pink salmon are abundant. However, the obvious implication is that these other species will "switch back" to the prey with higher nutritional value when pink salmon are at lower levels of abundance. Because chum and sockeye salmon comprise almost 80% of the oceanic biomass of salmon, salmon predation pressure on the "high value" prey remains relatively constant.

Effects of pink salmon abundance are often used as a proxy for deleterious effects of large-scale enhancement in general. In fact, while pink salmon are the most numerous of the salmon species in the North Pacific Ocean, wild stocks of pink salmon contribute some 85% of the overall abundance.

Density dependent interactions have been identified within and between species of salmon. These interactions have been observed during both periods of low and high abundance. Changes in size, survival and age at maturity have been attributed to these interactions. Despite the existence of

competitive interactions in the marine environment, high productivity of Alaska salmon has persisted during this period of high abundance. In general, size declines of pink and chum salmon occurred prior to the 1977 regime shift, and thus are associated with poorer ocean conditions rather than ocean abundance of salmon, and sockeye salmon size has been stable over the past 60+ years.

There is also concern that the high ocean abundance of the big three (pink, chum, and sockeye salmon) negatively impact coho and Chinook salmon in Alaska. For coho salmon, size declines in Southeast Alaska have been linked to pink salmon abundance in the Gulf of Alaska, while in Canada recent size increases in coho salmon have been positively associated with the combined biomass of pinks, chums, and sockeye salmon. The high correlation of run strength between coho and pink salmon in Southeast Alaska is strong evidence that their abundance is driven by similar overall response to shared marine conditions. Density-dependent mechanism other than competition may also play a role in pink salmon/coho salmon dynamics. These include such as predator sheltering of coho salmon juveniles by the more abundant pink salmon juveniles (decreasing predation on coho juveniles), predator aggregation (increasing predation on coho juveniles), and direct predation of coho juveniles and adults on pink salmon juveniles.

Chinook salmon stocks in Alaska have been depressed in recent years due to reduced marine survival, and have declined in size at age for older fish, and age at maturity. These changes are not likely driven by the high abundance of salmon in oceanic habitats. Chinook salmon, by their propensity to utilize deeper depth strata and distribute more broadly on shelf and slope areas during marine residency, are segregated to a large degree from other salmon in their use of ocean habitats with correspondingly different temperatures, prey fields, and predator complexes. Size of Chinook salmon at ocean age 2 has not declined, indicating no density-dependent effect on growth through the first two years at sea. Size declines at older ages are more consistent with selective removal of older, larger fish.

Survival declines of Chinook salmon occurred well into the period of high ocean biomass. There is substantial evidence that much of the variation in Chinook salmon marine survival is due to conditions in the first summer and winter at sea. Changes in the North Pacific ecosystem, such as increased killer whale predation, could introduce more mortality at older ages, and further depress realized survival during periods of poorer environmental conditions for Chinook salmon.

Favorable ocean conditions rather than density-dependent interactions seem to be driving both the high abundance at the basin-scale and the high variability in salmon populations at local and regional scales. Recent climatic and oceanographic events such as the marine heat waves of 2004/2005 and 2014/2015 in the Gulf of Alaska are demonstrative of the intrinsic variability of ocean conditions affecting salmon at local and regional scales. Will density-dependent interactions become increasingly important if and when ocean conditions become less favorable to salmon, with large releases of hatchery fish putting wild stocks in more jeopardy? Or will hatchery fish provide a buffer to sustain fisheries when wild stock productivity is low in response to varying environmental conditions? We conclude the latter, because there is empirical evidence that large releases and returns of hatchery pink salmon in years of both low and high wild stock abundance did not limit the production potential of the wild stocks.

Introduction

The Alaska Board of Fisheries (BOF) was recently petitioned to hold an emergency meeting asking the BOF to amend actions taken in Permit Alteration Requests (PARs) made by the Prince William Sound (PWS) Regional Planning Team and deny the increase in the number of pink salmon eggs taken in 2018 by 20 million eggs. One of the rationales the petitioners used for rescinding the PAR was "… great concern over the biological impacts associated with continued release of very large numbers of hatchery salmon into the North Pacific Ocean, including the Bering Sea and the Gulf of Alaska." To support this concern, the petitioners provided references to record high abundance and biomass of salmon in the North Pacific, as well as possible density-dependent effects of pink salmon on the trophic structure in the North Pacific Ocean and intra-specific and interspecific competition of pink salmon with other species of salmon and seabirds.

The BOF held the emergency meeting on July 17, 2018, and denied the request for rescinding the PAR. The BOF determined there was no need for such an emergency action, and deferred further consideration to the review of the State's salmon enhancement program scheduled for the October 2018 work session. The intention of that review is for members of the BOF to educate themselves about the program and understand the science the enhancement program is predicated on and the current scientific evaluation.

This paper provides a brief, broad overview of the issue of record abundance and biomass of Pacific salmon and the implications for the status of Alaska salmon. We present this overview in six sections. The first is a review of the recent information on abundance of salmon in the North Pacific. The second is an examination of trends in harvest of Alaska salmon, including enhanced production. The third is a discussion of oceanographic conditions and the concept of "carrying capacity" for salmon in the North Pacific. The fourth is a perspective on the relative role of salmon as a component of the North Pacific ecosystem. The fifth looks at intra- and interspecific competition and density dependence among salmon species, and its possible impacts on growth and abundance. The sixth section summarizes our conclusions from this overview.

I. High Abundance and Biomass of Salmon in the North Pacific Ocean

In a recent paper, Ruggerone and Irvine (2018) published an excellent compendium of the available data on numbers and biomass of pink, chum, and sockeye salmon in the North Pacific Ocean over the time period 1925 through 2015. The authors have compiled diverse data sources of harvest, harvest rates, and escapement. They have used reasonable approaches to estimating total salmon escapements by species by region, and to estimate hatchery and wild origins.

They found that the abundance and biomass of pink, sockeye, and chum salmon has been higher in the past 2.5 decades (1990-2015) than at any time in the 90-year time series, averaging 665 million adult salmon each year (1.32 × million metric tons) during 1990–2015 (Figure 1). During 1990–2015, pink salmon dominated adult abundance (67% of total) and biomass (48%), followed by chum salmon (20%, 35%) and sockeye salmon (13%, 17%). When immature salmon biomass was included in the biomass estimates, biomass was dominated by chum salmon (60% of the combined biomass of all three species),

followed by pink salmon (22%) and sockeye salmon (18%).

The high biomass has been remarkably consistent over the 1990-2015 time period. There has been higher variability in numbers of salmon than in biomass due to the variability in pink salmon abundance.

Alaska produced approximately 39% of all pink salmon, 22% of chum Salmon, and 69% of sockeye salmon, while Japan and Russia produced most of the remainder. Approximately 60% of chum salmon, 15% of pink salmon, and 4% of sockeye salmon during 1990–2015 were of hatchery origin. Alaska generated 68% and 95% of hatchery pink salmon and sockeye salmon, respectively, while Japan produced 75% of hatchery chum salmon. Salmon abundance in large areas of Alaska (PWS and Southeast Alaska), Russia (Sakhalin and Kuril islands), Japan, and South Korea are dominated by hatchery salmon. During 1990–2015, hatchery salmon represented approximately 40% of the total biomass of adult and immature salmon in the ocean.

In the context of concern for the impacts of hatchery fish on wild salmon and the North Pacific ecosystem, we reiterate three facts about pink salmon noted above. Pink salmon are the most abundant of the species, have the greatest temporal variability in abundance, and are mostly (85%) wild origin (Ruggerone and Irvine 2018). As we will discuss below, the high variability of pink salmon and differences in abundance between odd-year and even-year lines is often used to examine competitive interactions and ecosystem level impacts of salmon in the North Pacific. At the basin-scale, to the extent that such effects may occur, effects of pink salmon are predominately from wild-stock populations rather than from enhanced fish.

II. Trends in Harvest of Alaska Salmon

The high sustained abundance and biomass in the North Pacific Ocean reported by Ruggerone and Irvine (2018) is driven in no small part by historically high abundance of Alaska salmon. It is instructive to put the current levels of salmon harvest into perspective of the 115 year time series of Alaska commercial salmon harvests (Figure 2), to recognize the extent of recovery and extraordinary recent productivity of Alaska salmon. In the early 1970's, Alaska salmon harvests were at their nadir, with statewide catches of all species averaging just 22 million fish in 1973 and 1974 (Figure 2). In the "good old days" of the 1930s, catches sometimes exceeded 100 million. The State of Alaska initiated a number of management actions to address the decline and rebuild production (Clark et al. 2006), with a goal of once again reaching harvests of 100 million salmon. In 1971, the Alaska Legislature established the Division of Fisheries Rehabilitation Enhancement and Development (FRED) within the Alaska Department of Fish and Game (ADF&G) for hatchery development. In 1972, Alaska voters approved an amendment to the state Constitution (Article 8, section 15), providing for an exemption to the "no exclusive right of fishery" clause, enabling limited entry to Alaska's state fisheries and allowing harvest of salmon for broodstock and cost recovery for hatcheries. In 1974, the Alaska Legislature expanded the hatchery program, authorizing private nonprofit (PNP) corporations to operate salmon hatcheries.

Alaska's modern salmon hatchery system started in the 1970s and grew out of depressed fisheries that reached record low harvest levels. At the same time a century old Japanese salmon hatchery system was undergoing dramatic improvements in performance with record high marine survivals of young salmon, increased releases of up to 2 billion juveniles per year, and returns of adult chum salmon ranging from

40 to 60 million fish annually (Kobayashi 1980). These impressive results caught the attention of officials and scientists developing Alaska salmon hatchery program.

Exchanges between Japanese and Alaska scientists, fishermen, and industry helped forge the enhancement strategies and policies in Alaska, resulting in similarities in the two hatchery programs. Similarities include hatcheries operated by private fishermen groups where salmon catches are taxed under a user-pay system to help defray cost of hatchery operations, a focus mostly on pink or chum salmon production, and extensive short-term rearing of pink and chums salmon fry to improve marine survival. However, as reviewed by Heard (2011), there also are significant differences between salmon fisheries, policies, and hatchery operations in the two countries. Commercial salmon fisheries in Japan have been largely dependent on hatcheries while development of hatcheries in Alaska focused on fisheries based on a careful balance between wild and hatchery production (McGee 2004). Some important differences in the two systems include locating Alaska hatcheries on non-anadromous water sources and not on important wild stock river systems, careful selection of brood stocks within a region and restricting use of hatchery brood stocks to specific geographic areas.

Alaska salmon harvests recovered rapidly in the second half of the 1970s, and exceeded 100 million fish by 1980 (Figure 2). With the exception of 1986 (96 million), the statewide catch has been over 100 million salmon annually since 1980. For 1990-2015, harvest has averaged 177 million salmon. After 1980, hatchery production started making up an increasing portion of the harvest. In the last decade (2008-2017), hatchery salmon have composed about 33% of the total commercial harvest, averaging 67 million fish annually (Stopha 2018).

This remarkable recovery and historically high abundance of Alaska salmon can be attributed to five major factors: (1) large expanses of relatively pristine and undeveloped habitats; (2) salmon management policies that have evolved since statehood (Eggers 1992, Clark et al. 2006); (3) the elimination of high seas drift-net fisheries(Clark et al. 2006); (4) production from large-scale hatchery programs designed and managed to supplement natural production (McGee 2004, Stopha 2018); and (5) favorable environmental conditions associated with the 1977 “regime shift” affecting the ecosystem dynamics of the North Pacific Ocean.

III. **Ocean Conditions and Carrying Capacity**

“*Trying to define ocean carrying capacity is like trying to catch a moonbeam in a jar”. O. Gritsenko, VINRO, Moscow. Member, NPAFC Committee on Scientific Research and Statistics.*

The recovery of Alaska salmon and the record abundances throughout the North Pacific have been repeatedly linked to changes in ocean conditions characterized as the 1977 regime shift. Warming ocean conditions resulted in striking increases in primary and secondary production (Brodeur and Ware 1992). These changes in temperature and lower-trophic level production were associated with profound changes in species composition of fish and crustaceans (Anderson and Piatt 1999). Salmon as a group benefitted (and are an important component of) these ecosystem level changes, with the dramatic increases in abundance observed around the Pacific rim. The importance of the marine ecosystem to the abundance trends is emphasized by the success of large-scale enhancement systems in both Alaska and

Japan concurrent with the high production of wild stocks from Alaska and Russia. Wild stocks are responding to the effects of climate on both freshwater and marine ecosystems, while variation in hatchery returns for a given level of production is driven entirely by the marine conditions encountered.

Carrying capacity has been defined as the ability of an ecosystem to sustain reproduction and normal functioning of a set of organisms (Farley et al. 2018). For salmon in the ocean, feeding and survival conditions are defined by a complex of physical and biological factors, involving both bottom-up (prey) and top-down (predators) processes (Radchenko et al. 2018). These are dynamic processes, resulting in annual variability in salmon production in the marine environment. The ocean conditions driving these processes vary over both short and long time periods, so that annual variability occurs in the context of "regimes" that can be favorable or unfavorable to salmon (Beamish et al. 1999,2004; Shuntov et al. 2017; Radchenko 2018).

Over the past few decades, "carrying capacity" conditions in the North Pacific Ocean have been generally favorable to Pacific salmon as reflected by the sustained high abundances and catches. However, responses of stocks of Pacific salmon have not been uniform during this period, and extremes in survival and production have occurred both temporally and geographically. Survival and year-class strength of salmon is the result of responses to local, regional, and basin scale conditions, and not a result of a homogeneous ocean carrying capacity (Heard and Wertheimer 2012).

Marine survival of Pacific salmon is more correlated between neighboring populations than with more distant ones (Mueter et al. 2005; Pyper et al. 2005; Sharma 2013), emphasizing the importance of local and regional conditions. The first few months at sea is the period of highest mortality per day for juvenile salmon in the marine environment (Heard 1991; Quinn 2005; Farley et al. 2007, 2018). Variability in mortality during this period can be large, and can be the major driver of year-class strength. An extreme example is the returns of Fraser River sockeye salmon in 2009 and 2010. In 2009, only 1.5 million fish returned, the lowest return since 1947; in 2010, 29 million fish returned, the highest number since 1913. Conditions during the early marine period are considered the primary factor affecting these changes in survival of Fraser River sockeye salmon (Beamish et al. 2012).

Salmon surviving the early marine period are exposed to continued mortality, albeit at a lower rate (Quinn 2005). The first winter at sea has been posited as a critical time period for determining year class strength (Beamish et al. 2004; Moss 2005). Older immature and maturing salmon have much lower mortality rates (Ricker 1976), but these extend over a longer period of time, from 1 year for pink salmon to 5 years for Chinook salmon. Forecasting approaches using juvenile salmon abundance index to predict returns (Wertheimer et al 2017; Murphy et al. 2017) assume that recruitment through the early marine stage has established year-class strength, and that subsequent mortality does not vary substantially from year-to-year. However, Radchenko (2018) reports that cumulative ocean mortality can vary 1.5-2 times. These ocean effects on survival can result in large deviations, positive and negative, from forecasts from juvenile salmon indexes (Figure 3). For 2006, the forecast for Southeast Alaska pink salmon harvest was 35 million fish; the actual harvest was 11 million fish, less than one third of the forecast. In contrast, the pink salmon forecast for 2013 was 53.8 M fish, but the forecast was 43% lower than the actual harvest of 94.7 million fish, the largest harvest since catch records were recorded dating back to 1900 (Figure 3, Figure 4).

These results illustrate that variations in marine survival between different local or regional areas occur in the context of larger basin-scale climatic influences on overall production levels of pink and chum salmon in the GOA. Prevailing basin-scale conditions likely strongly influence environmental factors that favor a higher or lower range or level of potential survival for juvenile salmon from different regions.

The "carrying capacity" encountered by a salmon population is a cumulative effect encompassing different life-history phases. The conditions encountered by the salmon will depend on their geographic origin and their ocean migration patterns, which differ by species and stocks. The ocean is a dynamic environment, with substantial variability throughout the North Pacific basin. In 2013, "carrying capacity" for pink salmon in the Gulf of Alaska (GOA) was high, with strong returns throughout the GOA. Returns in both Southeast Alaska and PWS were at record levels. In contrast, in 2015 pink salmon again returned to PWS in record numbers, while returns in Southeast Alaska were below the 1995-2015 average and below forecasts from juvenile salmon indexes, demonstrative of the regional nature of the response of pink salmon stocks to ocean conditions (nearshore and oceanic).

While the general warming in the North Pacific Ocean has been a feature of the high productivity for salmon (Brodeur and Ware 1992; Mantua et al. 1997; Farley et al. 2018), ocean warming events associated with climate change are occurring with more frequency, often with detrimental impacts on salmon (McKinnell 2017). Recent ocean warming events are associated with the decline of the even-year pink salmon in Southeast Alaska. From 1960 through 2005, there was no clear dominance of even or odd year lines of pink salmon in Southeast Alaska (Figure 4). In the summer of 2005, juvenile pink salmon from SEAK encountered anomalous warm conditions in the Gulf of Alaska (Figure 5). These ocean conditions were associated with the occurrence of neretic fish and invertebrates characteristic of more southern locales, including Humboldt squid, blue shark, Pacific sardine, and pomfret (Wing 2006). The resultant 2006 return was, as noted above, only one-third of forecast, and the lowest since 1988. Even year pink salmon appeared to be recovering relative to the 2006 return, attaining a harvest of 37 million in 2014.

In the winter of 2014/2015, another marine heatwave, aka the warm blob, reached the eastern GOA (DiLrenzo and Mantua 2016). The 2014-brood pink salmon that entered the GOA in 2015 again had poorer than expected survival, attaining only half of the forecast in 2016 (Figure 3). Poor pink salmon returns occurred throughout the Gulf of Alaska in 2016, resulting in a Federal disaster declaration for the fishery. The broad nature of the pink salmon run failure is indicative of shared ocean effects. However, regional and local variability were also apparent. In Southeast Alaska, harvests of pink salmon in the northern area were 20% of the recent 10-year average, whereas in the southern area harvest was 80% of the recent 10-year average. In PWS, much of the catch was supported by fish from Solomon Gulch Hatchery, which was still 50% below forecasts based on average marine survivals. Marine survivals were poorer yet for pink salmon from Prince William Sound Aquaculture Association hatcheries, where returns were less than 20% of forecast (Russell et al. 2017).

The 2005 and 2015 ocean heat waves thus had a broad-scale impact on the carrying capacity for pink salmon in the Gulf of Alaska, with 2015 having a more pervasive impact among regions. Both wild and hatchery fish were affected; the return to SEAK is predominately (> 95%) wild, and the hatchery return

to PWS was the lowest since 1993.

It is noteworthy that despite the poor returns of pink salmon, generally the most abundant species in the Alaska harvest, statewide harvest in 2016 was still above 100 million salmon (Figure 2). Variability in abundance numbers throughout the North Pacific reflects high variability in pink salmon, which appear to be the most sensitive salmon species to annual changes in ocean conditions because of their lack of multiple year-classes at sea.

Ruggerone and Irvine (2018) raised the concern that the high abundance of salmon coupled with variability in stock performances indicates that carrying capacity of the North Pacific Ocean for salmon has been reached or exceeded. This is not the first time such concerns have been raised. Various authors over the past 20 years have posited that high abundance of pink, sockeye, and hatchery chum salmon may have exceeded carrying capacity and be negatively affecting or constraining salmon production (e.g., Peterman et al. 1998; Ruggerone et al. 2003; Davis (2003); Sinyakov (2005, cited in Shuntov et al. 2017). In spite of these concerns, abundance and biomass have continued to be high, reaching record levels in recent years (Figure 1).

As Shuntov et al. (2017) noted, ocean carrying capacity for Pacific salmon is not a fixed productivity limit, and the considerable regional and temporal variability in salmon stocks is a response to non-homogeneous ocean conditions. Rather than indicate that carrying capacity has been exceeded, the trend of the past three decades show that the North Pacific Ocean has had the capacity for the recovery and sustained production of wild stocks while supporting the expansion of large-scale enhancement production from Japan (chum salmon) and Alaska (chum and pink salmon). The sky has not yet fallen. This is not to say that the high abundance will persist indefinitely. The shock of the marine heat waves of 2004/2005 and 2014/2015 to Alaska pink salmon demonstrates that carrying capacity can vary within a productive regime, and reminds us that the status of the current production regime is vulnerable to both gradual and abrupt changes driven by a warming climate. Continued warming could result in contraction of the range of Pacific salmon in the North Pacific Ocean (Welch et al. 1998).

IV. **Trophic Position of Salmon in the North Pacific Ecosystem**

A major concern over the high abundance of salmon is that their feeding capacity alters the biomass of oceanic zooplankton, and in turn the phytoplankton biomass (Ruggerone and Irvine 2018; Batten et al., in press). This “trophic cascade” and alteration of the food web has been linked to decline in size and abundance of Alaska Chinook salmon and coho salmon (Ruggerone and Irvine 2018; Shaul and Geiger 2016); growth and diet of salmon (Davis 2003); and declines in seabird nesting success and survival (Springer and Van Vielt 2014; Springer et al. 2018).

Dominance of oceanic food webs by salmon is not consistent with the abundance and biomass of salmon relative to other components of the North Pacific ecosystem, including competitors and prey fields. In the western North Pacific, Shuntov et al. (2017) estimated the nekton biomass was 81.3 million t (from 50 to 100 million t in different years). Pacific salmon accounted for 1–2% of this biomass in the 1980s. Biomass of salmon subsequently increased to the current levels of 4-5 million t, representing 4-8% of total nektonic biomass during the current period of high abundance. During this period, the biomass of

the two most abundant fish species within their ranges in the North Pacific, walleye pollock (*Theragra chalcogramma*) and Japanese pilchard (*Sardinops melanostictus*), reached 50 million t each.

In the epipelagic layer, Shuntov et al. (2017) estimated that the mean annual food consumption (plankton and small nekton) by the nektonic fauna varied within 210.4–327.3 million t; in the 0–1000 m layer it ranged from 389.0 to 516.0 million t. The amount of food consumed by salmon was 4–8 million t. The proportion of total nekton ration consumed by salmon in the epipelagic layer was 1% - 15%, depending on oceanic area (Figure 6).

This view of low to moderate impact on epipelagic food webs is consistent with mass-balance modeling of North Pacific ecosystems by Pauley et al. (1996). Pacific salmon and steelhead were estimated to make up 4.6% of the epipelagic fish biomass in the Alaska gyre. If squid are including as competitive nekton for zooplankton production, Pacific salmon made up 3.4% of the nektonic biomass. Estimated salmon biomass was < 1% of the estimated zooplankton biomass.

Similarly, the impacts of juvenile salmon feeding during early marine residency on zooplankton has been found to be relatively low. As noted above, the early marine residency is a period of high and variable mortality which may determine year class strength. Given more limited areal habitat than the coastal zone and ocean basin, this period may represent a potential bottleneck for survival. Orsi et al. (2004) used a bioenergetics model to examine consumption of zooplankton by hatchery and wild chum salmon in Icy Strait, Southeast Alaska. They found that juvenile chum salmon consumed only 0.05% of the zooplankton/km2 in the upper 20-m of the water column, and 0.005% for the integrated water column to 200 m in June and July in 2001. Because juvenile salmon are typically in the upper water column, total standing crop of zooplankton is not likely to be available as forage on a daily basis, but does represent a source for zooplankton abundance in the surface layer through vertical diel migrations. The percentage of available prey consumed by juvenile salmon in the neritic habitat of Icy Strait was less than 0.05% of the available standing stock. Low consumption estimates were also estimated by several other studies. Karpenko (2002) reported that juvenile chum salmon consumed between 0.1 and 1.1% of the total stock of zooplankton in the upper 10 m of Karaginskii Bay, Kamchatka from June to August over a 5-year period. Cooney (1993) estimated juvenile salmon in PWS consumed 0.8–3.2% of the total herbivore production and 3.0–10.0% of the macrozooplankton production. Boldt and Haldorson (2002) reported that juvenile pink salmon near PWS could consume 15–19% of preferred prey taxa such as large calanoid copepods and amphipods if the available standing crop was fixed over a 10-day period; however, on a daily basis, consumption of no taxon exceeded 2% of the standing stock.

Pink salmon have been identified by some authors as the salmon species most affecting oceanic food webs (Ruggerone and Irvine 2018). Surface layer zooplankton indexes have been associated with differences in abundances of odd- and even-year pink salmon stocks (Batten et al. in press). However, there was no directed fish sampling or monitoring of zooplankton below the surface layer (7.5 m) in Batten et al.'s study. Radchenko et al. (2018) reviews studies showing that "as a rule, no significant correlations occur among pink salmon growth rate, stock abundance, or zooplankton standing crop."

A conceptual problem to assigning plankton depletion to pink salmon feeding is prey-switching by salmon species. Pink, chum, and sockeye salmon have substantial overlap in their diets, and the latter two species have been shown to switch to other, "lower-quality" prey when pink salmon are abundant

(e.g., Davis 2003). These changes in feeding habit are often used to support the concept of density-dependent interactions with pink salmon and their congeners, e.g., Ruggerone and Connors (2015). However, if other species switch prey in response to high pink salmon abundance, they certainly would switch back to the "higher value" prey when pinks are not as abundant. Chum and sockeye salmon make up on average 78% of the biomass of these three species. As a result, there is more of a constant prey demand among this feeding guild in spite of the high variability in pink salmon abundance in the North Pacific. Rather than shaping the ocean food web, pink salmon appear to be most sensitive to interannual changes in oceanic conditions, resulting in high variability in their numbers, both temporally and geographically.

Competition among species may also be minimized by the distribution of salmon in oceanic habitats. Unlike the schooling behavior characteristic of juvenile salmon and maturing salmon in nearshore and coastal areas, salmon at sea are widely dispersed (Shuntov 2017). This behavior reduces competitive interactions and makes their feeding, growth, and survival in the ocean more density-independent.

The record numbers and abundance of Pacific salmon can appear to be an imposing load on the North Pacific Ocean ecosystem. Four to five million tons of biomass is not a trivial amount. Of this 40% is hatchery origin, primarily chum salmon. Approximately 5 billion hatchery juveniles are released into the North Pacific annually (Figure 7). However, the North Pacific Ocean is a large marine ecosystem, and the numbers are not overwhelming when put into context of total nekton and forage bases. Not all nektonic prey is available to salmon due to depth distribution; Ayedin (2000) concluded local depletion of prey by salmon can occur as salmon school density increases, even if prey is not depleted over large ocean areas. This is an important point in understanding regional differences in changes in size at return.

The sustained high marine abundances of both natural- and hatchery-origin salmon over the past 25 years indicates that the trophic structure has not been altered in some way that inhibits salmon productivity. We agree with the conclusion of Shuntov et al. (2017): "… the role of salmon in the trophic webs of subarctic waters is rather moderate. Therefore, neither pink nor chum salmon can be considered as the species responsible for the large reorganization in ecosystems and the population fluctuations in other common nekton species."

V. Competition and density dependence versus density independent responses

An intuitive concern with the high abundance of salmon in the context of ocean carrying capacity is that density-dependent competition for limited prey resources may affect growth and survival of salmon populations. Pink, chum, and sockeye salmon have substantial overlap in their diets (Davis 2003, Brodeur et al. 2007) and the latter two species have been shown to switch to other, "lower-quality" prey when pink salmon are abundant (e.g., Davis 2003). High abundance of pink salmon in the Gulf Alaska has been associated with growth and size at return of chum salmon, sockeye salmon, coho salmon, Chinook salmon, and pink salmon themselves (e.g., Agler et al. 2011; Jeffrey et al. 2017; Ruggerone et al. 2003, 2018: Shaul and Geiger 2017; Wertheimer et al. 2004a). Reduced growth can result in lower size-at-age, shifts in age at maturity for species spending multiple years at sea, and reduced fecundity, which can affect productivity of salmon populations. Ruggerone et al. (2003) ascribed large reductions

in marine survival of Bristol Bay sockeye salmon to the impact of Asian pink salmon on the sockeye salmon growth at sea. The concern for density-dependent competition is not new; Peterman (1984) found evidence of density-dependent interactions between Fraser River and Bristol Bay sockeye salmon. This was at a time when salmon abundance had not expanded to current levels and when hatchery fish made up a low proportion of the abundance and biomass. As salmon abundance and biomass increases, Aydin (2000) concluded that density-dependent interactions could result in negative feedback loops on prey availability in the ocean ecosystem.

Despite the existence of competitive interactions in the marine environment, high abundance and biomass have not resulted in consistent negative trends in salmon size or productivity. Ruggerone et al. (2018) reported that average size has declined for chum salmon and pink salmon since 1925, but not for sockeye salmon (Figure 8). Most of the size decline for pink and chum salmon occurred prior to 1977, which would suggest that pre-1977 regime change conditions were more important than density dependent interactions. Size of pink salmon and sockeye salmon remained stable during the recent period of high abundance, while chum salmon showed some continued decline. Jeffrey et al. (2017) reported similar results for average sizes of British Columbia pink, chum, and sockeye salmon since 1951. Pink salmon declined initially in size, and then have remained relatively stable since the 1990s at a size that is 20-30% less than in the 1950s and 1960s. There was little change over the time series in the average size of sockeye salmon. Regional differences have certainly been observed. For example, Wertheimer et al. (2004) found evidence of size declines in PWS pink salmon in relation to pink salmon abundance in the GOA, while. Shaul and Geiger (2017) reported that pink salmon size has increased in Southeast Alaska in recent years.

Helle et al. (2007) found that body-size of pink, chum, and sockeye salmon from Alaska to Oregon generally declined in after the 1977 regime shift as salmon abundance increased, until 1994. After 1994, body size of these species generally increased, during a period when biomass and abundance was at sustained high levels. They attributed the initial decline to density-dependent competition, and the lack of relationship of abundance to size in the latter period as an outcome of favorable ocean conditions. They concluded that the carrying capacity of the North Pacific Ocean for producing Pacific salmon is not a constant value and varies with changing environmental and biological factors.

In their study on size of British Columbia salmon, Jeffrey et al. (2017) examined the relationship of size trends to estimates of salmon biomass in the North Pacific Ocean. They found that the biomass of North American pink salmon entering the Gulf of Alaska was the most important biomass variable in explaining size variation in BC pink salmon. The direction of the effect was negative, suggesting intraspecific competition was affecting size. For chum salmon, combined biomass of North American pink, sockeye, and chum salmon was the most important biomass variable explaining size variation. The direction of the effect was negative, suggesting some degree of competition among these congeners. Biomass of North American chum salmon was the most important biomass variable explaining size variation in sockeye salmon. Adding Asian chum salmon to this (or combined measures of biomass) did not improve the fit. The direction of the effect was positive, indicating that when chums are abundant, growth conditions for sockeye are positive.

These associations (and lack of associations) between ocean abundance and size at return of Alaska and British Columbia salmon indicate that while competition can affect size and growth, density-

independent ocean conditions drive the variability in abundance and can override the impacts of density-dependent competition. We reiterate the findings of Radchenko et al. (2018) that generally, no significant correlations occur among pink salmon growth rate, stock abundance, or zooplankton standing crop.

Reduced survival and productivity of wild stocks in Alaska have been attributed to competitive interactions with Asian pink salmon (Bristol Bay sockeye salmon; Ruggerone et al. 2003) and hatchery pink salmon (PWS pink salmon; Hilborn and Eggers 2001). Alternate analyses and recent trends have refuted these conclusions. In Bristol Bay sockeye salmon, Ruggerone et al. (2003) estimated reduced survivals of even-year sockeye salmon smolts from Bristol Bay at 23-45% less than odd-year smolts for the 1977 to 1997 smolt years. Even-year smolts enter the ocean when odd-year pink salmon are on average more abundant. They concluded that competitive interactions with Russian pink salmon reduced growth of even-year smolts, and resulted in substantially lower average smolt survival. However, the abundance of Russian pink salmon was highly variable over the time period for both odd and even year lines. When pink salmon abundance was considered in a time series analysis of the survival data, rather than using odd/even year average survival, there was no discernable effect of pink salmon abundance on survival (Wertheimer and Farley 2012). Subsequent to the 1997 smolt year, both Asian pink salmon and Bristol Bay sockeye salmon increased in abundance, and a marine survival index for Bristol Bay sockeye salmon smolts was positively associated with abundance (Farley et al. 2018.) Thus increasing biomass of Asian pink salmon has not constrained the continued high productivity of Bristol Bay sockeye salmon.

In PWS, Hilborn and Eggers (2000) concluded that hatchery production provided no net benefit in terms of pink salmon harvest, but was simply replacing wild production through density-dependent interactions. However, Wertheimer et al. (2004a, 2004b) showed that a density-independent index of marine survival explained much of the variability in wild pink salmon productivity, and that there was a large net benefit from enhancement to the PWS pink salmon harvest, albeit with some reduction in wild stock production attributed to the effects of size at return on fecundity. Amorosa et al. (2017) also showed large net gains from hatchery production, albeit lower than would be expected from the authors own argument for proportionate increases in wild pink salmon production following the 1977 regime shift. They minimize the contribution of hatchery fish in PWS by focusing on changes in the common property fishery, dismissing the annual cost-recovery harvest of an average of eight million pink salmon in their evaluation of benefits. The cost-recovery harvest is important to the fisheries economy of PWS, and an important benefit of the enhancement program (Pinkerton 1994). The recent analysis of productivity of PWS pink salmon for the re-certification of sustainability of PWS pink salmon showed continued sustained production of wild stocks during the hatchery era (Figure 9; Gaudet et al. 2017). The historical record returns of wild pink salmon in 2013 and then again in 2015 are particularly demonstrative that wild stocks in PWS retain their high production capacity after 40 years of hatchery enhancement.

Our discussion thus far has focused primarily on the abundance trends of pink, chum, and sockeye salmon, which combined make up most of the biomass of salmon in the North Pacific Ocean. Besides interactions among these species, there is concern that their high overall abundance is negatively impacting coho and Chinook salmon (Ruggerone et al. 2018).

The commercial harvest of coho salmon averaged 1.5 million fish from 1970-1977, then increased rapidly following the 1977 regime shift, peaking at over 9 million in 1994. From 1995 until 2017 the harvest has ranged from 3 to over 6 million fish annually, averaging 4.5 million, with no apparent trend during this period (Figure 10). Approximately 22% of the commercial harvest during the latter period has been produced from Alaska hatcheries. Recreational harvest has increased in recent years, and averaged 1.2 million fish from 2007-2017 (M. Stopha, ADF&G, personal communication).

Mallick et al. (2008) examined marine survival of 14 stocks of coho salmon in Southeast Alaska. They found evidence of effects on marine survival at local, regional, and basin scales. There was high covariation in survival regionally, and no trend was noted over the recent time period. Abundance of juvenile hatchery releases in the year coho smolts went to sea was identified as affecting marine survival, but the effect could be positive or negative, depending on stock. This result exemplifies the complex competitor/predator interactions that have been posited for coho and pink salmon. Negative impacts of large hatchery releases could indicate competition for prey resources or aggregation of prey (Beamish et al. 2018). Positive influences could be a result of "predator sheltering," where the abundant hatchery juveniles act as a buffer on predation on the less abundant, larger coho smolts (Holtby et al. 1990; Briscoe 2004; LaCroix 2009). Abundant hatchery fry and juveniles could also provide an important forage base for coho salmon. Coho salmon juveniles are a major predator of juvenile pink salmon in nearshore marine areas (Parker 1971, Hargreaves and LeBrasseur 1985) and as adults when returning to coastal areas as the juvenile pink salmon emigrate towards the ocean (Sturdevant et al. 2012).

Shaul and Geiger (2017) showed a negative trend in marine survival in recent years for Berners River coho salmon which they related to ocean biomass of North American pink salmon. They attribute the negative impact to predation of pink salmon on squids that are the major prey for coho salmon in offshore areas. They propose that pink salmon are keystone predators of squid, exerting top-down control and thus directing the energy flow in the system. In contrast, Aydin (2000) concluded that the squid, with its high biomass and productivity, was controlling energy flow to salmon. Aydin (2000) found that squid abundance, while highly variable, had increased greatly (as did salmon) after the 1977/1978 regime shift. That squid abundance increased commensurate with salmon abundance indicates the species were responding similarly to the increased productivity in the North Pacific (Brodeur and Ware 1992). Aydin (2000) also found differences in odd and even year distributions of squid in the North Pacific, which could contribute to the odd/even differences in coho salmon size observed by Shaul and Geiger (2017).

If pink salmon impacts on squid were driving marine survival for coho salmon, we would also expect decreasing trends in abundance and marine survival for coho salmon over the 1995-2015 time period of high pink salmon abundance. Instead, catch has been stable, and marine survival declines, at least in southeast Alaska, are a recent phenomenon. Commercial harvest data for coho salmon and pink salmon show very strong correlation annually (LaCroix et al. 2009). If density-dependent interactions were primary, we would expect negative correlation. The correlation is actually strongly positive; from 1960 – 2017, it had an r value of 0.82 ($P < 0.001$; Figure 10). Because returning adult coho and pink salmon have roughly the same period of time in the marine environment, this indicates that shared ocean conditions are driving their year-class strength.

Size trends in coho salmon have varied regionally, with very different relationships to ocean salmon biomass. Shaul and Geiger (2017) found that size at harvest of coho salmon in southeast Alaska increased from 1970 until 1984, then declined from 1985 to 2015. They associated the decline with an index of the biomass of North American pink salmon. Their model did not indicate direct competition, but rather lagged effects at 2- and 4- years affecting the population dynamics of the squid (*Berryteuthis anonychus*). The lag response model requires that the squid have an obligate two-year life-history cycle as proposed by Jorgensen (2011). This is contradicted by other literature, which characterizes *B. anonychus* as an annual species with high productivity (Katugin et al. 2005, Drobney et al. 2008). Aydin (2000) cites studies showing that *B. anonychus* is highly productive, and spawns twice a year.

Regardless of mechanism, coho salmon size has declined in Southeast Alaska. In contrast, coho salmon body size has increased in British Columbia in recent years. Jeffrey et al. (2017) showed coho body weight declined from the 1950s, and did not reach its minimum until around 1985. Since then it has increased and is now at the highest level in the data series. The combined biomass of North American pink, sockeye, and chum salmon was the most important biomass variable explaining size variation in coho salmon, and had a positive effect on size. The authors speculate that the positive relationship may be driven by environmental conditions, which when favorable allow for greater total biomass of salmon species and higher growth (thus larger size) in coho salmon. Shaul and Geiger (2017) and Jeffrey et al. (2017) both use basin-scale measures of environmental conditions in their models exploring factors affecting coho salmon size. The contrasting results for Southeast Alaska and British Columbia are indicative of the variability in response of different populations to these conditions. This may be caused by different migration patterns in the ocean environment, or different local and regional responses of availability of salmon forage to basin-scale environmental factors.

The recent disastrous returns of Chinook salmon in Alaska has precipitated considerable focus on the least abundant but (on a fish by fish basis) most highly valued salmon species (ADF&G 2013). Chinook salmon have a highly varied and diverse life history, generally more complex than other Pacific salmon exemplified by numerous variations in run and spawn timing, freshwater biology, ocean distribution and behavior patterns, diet, slower ocean growth, and older age at maturity (Healey 1991). In the eastern North Pacific most juvenile Chinook salmon from Oregon to Southeast Alaska remained within 100-200km of their natal rivers until their second year at sea, regardless of their freshwater history (sub-yearling or yearling) and spring, summer, or fall adult run timing (Trudel et al. 2009). Healey (1983) reported that most fall type Chinook salmon tend to remain continental shelf and slope oriented during much of their ocean life history whereas many spring type fish spend much of their ocean life in more offshore waters. In recent years, based on coded-wire tag recoveries, it was found that many Alaska spring-type Chinook salmon also utilize slope and continental shelf waters as immature adults. Coded - wire tagged Chinook salmon from Southeast Alaska (SEAK) and Cook Inlet frequently are recovered in Bering Sea Aleutian Island and Gulf of Alaska trawl fisheries for Walleye Pollock (Meyers et al. 2001; Celewycz et al. 2006).

Marine habitats of Chinook salmon related to depth distribution and migration patterns are diverse and often distinct from most other Pacific salmon. Juvenile Chinook salmon distribute deeper than coho and other juvenile salmon in their first summer and fall at sea (Orsi and Wertheimer 1995; Beamish 2011). Immature Chinook salmon are associated with colder temperatures and deeper depths than other salmon species (Walker et al. 2007; Walker and Myers 2009; Riddell et al. 2018). Diel vertical migrations have

been documented in a number of data storage telemetry studies, with movement to greater depths during daylight hours (Radchenko and Glebov 1998; Murphy and Heard 2001; Walker et al. 2007). One Chinook salmon tagged in the Bering sea typically was between the surface and 100 m depth, but occasionally moved to depths in excess of 350 m (Walker and Meyers 2009).

Marine diets of Chinook salmon are distinctly different than diets of pink, chum, and sockeye salmon and more similar to coho salmon (Brodeur et al. 2007; Riddell et al. 2018). Juvenile (first-ocean year) Chinook salmon in coastal waters initially have highly varied diets composed of fish, zooplankton, and insects, then become predominately piscivorous in costal habitats (Brodeur et al. 2007). Fish made up from 65% to 99% of stomach contents by weight for juvenile (ocean- age 0) Chinook salmon sampled within the inside and outer coastal waters of SEAK (Landingham et al. 1998: Weitkamp and Sturdevant 2008). Fish were also the primary prey for immature (mostly ocean-age 1) fish in SEAK (Cook and Sturdevant 2013), coastal British Columbia (Herz et al. 2017), and northern and southern Bering Sea (Farley et al. 2009). Primary prey species included capelin, sand lance, lanternfish, and Pacific herring. In more offshore habitats, Chinook salmon consume primarily fish and squid, although euphasids can make up a substantial portion of their diet (Davis 2003; Shuntov et al. 2010; Karpenko et al. 2013). Herring and sandlance dominate the diets of older immature and maturing Chinook salmon (ocean-ages 2+) in coastal waters (Reid 1961; ATA 2016), with sandlance the dominant prey in outside waters of southeast Alaska and herring the dominate prey in inside waters (ATA 2016).

Run sizes increased across AK after the 1977 regime shift, and were variable but consistently above average until a precipitous decline starting in 2006 (Figure 11). This decline was consistent with reduced marine survival of southeast Alaska stocks after the 2000 and 2001 brood years (ADF&G 2013; Ohlberger et al. 2016; CTC 2018). Thus the decline began well after the current period of high biomass of salmon in the ocean started (Figure 1), and well after hatchery releases into the North Pacific peaked and stabilized at 5 billion per year in 1988 (Figure 7).

Size at maturity and age at maturation has declined over the last three decades for Alaska Chinook salmon stocks from southern Southeast Alaska to the Yukon River (Lewis et al. 2017). The size declines are coincident with high abundances and biomass of the Big Three (pink, chum, and sockeye salmon). Could competitive interactions with the Big Three be driving the decline? There are several lines of evidence that indicate this is not the case.

First, the differences in marine ecology we noted in the preceding paragraphs suggest that Chinook salmon, by their propensity to utilize deeper depth strata and distribute more broadly on shelf and slope areas during marine residency, are segregated to a large degree from other salmon in their use of ocean habitats with correspondingly different temperatures, prey fields, and predator complexes. These differences are exemplified by the growth differences of Chinook salmon and coho salmon in their first winter at sea. Although approximately the same size in the fall, by the following year coho salmon of the same ocean cohort are over three times larger than Chinook salmon (Riddell et al. 2018).

Second, while Lewis et al. (2017) found predominately declining size for older (ocean age 3 and 4) Chinook salmon, size of ocean age 2 fish has generally not changed over the time period (Figure 12). If competition was driving the size decline, competition should be most intense for the younger age Chinook salmon, which have a more extensive overlap in size and type of prey with other salmon. Also, lower ocean growth in Pacific salmon is typically associated with shifts in age distribution towards older

ages (Hard et al. 2008), but instead average age at maturity has declined. Thus there has not been an apparent decline in growth of 1-ocean and 2-ocean age Chinook salmon during the "high abundance" period.

Third, British Columbia Chinook salmon have been increasing in average size over this time period (Jeffrey et al. 2017). These authors found a positive relationship between biomass of North American salmon and British Columbia Chinook salmon average size, indicating that size was a function of the same favorable ocean conditions sustaining the record overall biomass.

Size declines of Chinook salmon are not new in Alaska waters; Ricker (1981) found a significant decrease in size of Chinook salmon harvested in the SEAK troll fisheries from 1960 to 1974, and identified selective fishing for older, larger fish as a factor in the decline. Research by Hard et al. (2009) and others indicate selective harvesting of large older age groups of Chinook salmon can introduce reductions in fitness and cause genetic drift in growth, size, and age of maturity due to the heritability of these characteristics. However, fishing alone does not explain the decline across the geographic range of Alaska Chinook salmon, because the degree to which populations are exposed to directed selective fishing varies considerably across the range. It also does not explain the sudden decline in marine survival, as fishing pressure and exploitation rates in the ocean have not increased (CTC 2018b).

Another large predator besides humans also target larger, older Chinook salmon. Resident killer whales have been found to preferentially feed on larger Chinook salmon (Olesiuk et al. 1990; Hanson et al. 2010). In northern British Columbia and southern Alaska waters killer whales have increased at annual rates of 2.9% and 3.5%, respectively (Hilborn et al. 2012; Matkin et al.2014), more than doubling their abundance since the 1970s. Intense predation on larger fish, coupled with lower marine survival, could contribute to the changes at size at age and age at maturity of Alaska Chinook salmon.

There is substantial evidence that much of the variation in Chinook salmon marine survival is due to conditions in the first summer and winter at sea (e.g., Greene et al. 2005: Duffy and Beuchamp 2011; Sharma et al. 2013; Murphy et al. 2017). Local conditions encountered by juvenile Chinook salmon during early marine residency thus play an important role in determining year-class strength. However, the concordant trends in survival across such a broad geographic range indicate that large-scale processes are affecting stocks across regions. Increasing populations of pinnipeds could also be affecting early marine survival. Chasco et al. (2017) estimated predation on juvenile Chinook salmon by pinnipeds in Puget Sound had increased an order of magnitude from 1970 to 2015, and was now, expressed as adult equivalences, more than six times greater than the combined commercial and recreational catches in Puget Sound.

For Pacific salmon species that spend multiple years at sea, annual marine survival generally increases with size and age (Ricker 1976). For cohort reconstruction of Pacific northwest and SEAK Chinook salmon, natural mortality is assumed not to vary interannually and to decrease with ocean age, from 40% for ocean-age 1, 30% for ocean-age 2, 20% for ocean-age 3, and 10% for ocean-age 5 or older (Sharma et al. 2013; CTC 2018b). These assumptions are simplistic and undoubtedly not always correct, but there is little information to better inform the assumptions. Changes in the North Pacific ecosystem, such as increased killer whale populations, could introduce more mortality at older ages, and further depress realized survival during periods of poorer environmental conditions for Chinook salmon.

VI. **Conclusions**

In spite of concerns over exceeding the carrying capacity of the ocean, Alaska salmon have been at unprecedented levels of abundance over the past 25 years. Conditions influencing survival in the ocean, rather than density-dependent interactions, seem to be driving both the high abundance at the basin-scale and the high variability in salmon populations at local and regional scales. The Alaska salmon harvest over the past 25 years has been characterized by sustained high production from wild stocks and large contributions of hatchery fish. Enhancement has made large net contributions to supplement wild stock harvest in some areas of the state. Density-dependent interactions have been observed at different life history stages of salmon and in nearshore and oceanic habitats during this period, but have not constrained the recovery of Alaska salmon from its nadir in the 1970's, or it sustained high abundance. Rather, density independent responses to climatic factors affecting ocean conditions appear to have largely driven the high and variable productivity of Alaska salmon.

Recent climatic and oceanographic events such as the marine heat waves of 2004/2005 and 2014/2015 in the Gulf of Alaska are demonstrative of the intrinsic variability of ocean conditions affecting salmon at local and regional scales. Will density-dependent interactions become increasingly important if and when ocean conditions become less favorable to salmon? Would then large releases of hatchery fish put wild stocks in more jeopardy? Or will hatchery fish provide a buffer to sustain fisheries when wild stock productivity is low in response to varying environmental conditions? The enhancement program in PWS offers empirical support for the latter concept. Even during the recent period of generally high productivity, wild pink salmon production in PWS has fluctuated dramatically (Figure 9). In 2009, wild stock harvests were below one million fish, while over 17 million hatchery fish were harvested. By focusing harvest on hatchery fish, managers met escapement goals (Gaudet et al. 2017). Subsequently, both hatchery and wild pink salmon set new historical highs for harvest and production in 2013 and 2015. Large releases and returns of hatchery pink salmon in years of both low and high wild stock abundance did not limit the production potential of the wild stocks.

Authors

Alex Wertheimer retired after 35 years working for the National Marine Fisheries Service Fisheries as a Fisheries Research Biologist in Alaska. He has carried out research and published extensively on salmon in Alaska on issues including salmon enhancement technology and strategies, hatchery and wild salmon interactions, bycatch mortality of Pacific salmon, the impact of the Exxon Valdez oil spill on salmon in Prince William Sound, and the nearshore and pelagic marine ecology of Pacific salmon. He was a member of the science team that wrote the Alaska Genetic Policy, the National Oceanic and Atmospheric Administration (NOAA) Biological Review Team assessing status of Chinook salmon in the Pacific northwest, and the Chinook Technical Committee of the Pacific Salmon Commission. He was awarded the Wally Nuremberg Award for Fisheries Excellence by the American Fisheries Society Alaska Chapter. Upon retirement in 2009 after 35 years of Federal service, he received the NOAA Distinguished Career Award. Since retirement, he has continued to consult on scientific studies and reviews, including forecasting of Pacific salmon, quantification of by-catch mortality, and the Pacific Salmon Recovery Plan. He currently serves on the Pacific Salmon Commission's Standing Committee on Scientific Cooperation and on the Science Panel overseeing the Alaska Hatchery Research Program. He is the President of the Board of Directors of the Southeast Alaska Land Trust, and is a member of the Board of Directors for DIPAC, Inc., a major non-association private non-profit hatchery based in Juneau. He was supported in his work on this paper by the Northern Southeast Alaska Aquaculture Association.

William (Bill) Heard retired in 2012 after 52 years of Federal Service as Fishery Research Biologist. Much of his career was with NOAA Fisheries Alaska Fisheries Science Center's Auke Bay Laboratories, but he also worked for the U.S Fish and Wildlife Service Bureau of Commercial Fisheries and Bureau of Sport Fisheries and Wildlife. He did extensive research and published frequently on Alaska salmon and other fishes. Bill authored or co-authored peer reviewed publications on all five species of North American Pacific salmon. For over 35 years he supervised research at Little Port Marine Research Station focused on enhancement technology and ecology of pink, coho and Chinook salmon. He actively participated on many technical committees and focused groups involved with Alaska, National, and International salmon issues, including Governor Jay Hammond's Fisheries Council concerned with policies and development of salmon hatcheries in Alaska, North Pacific Fishery Management Council Plan Development Team for Fishery Management Plan (FMP) on salmon fisheries, Pacific Salmon Commission (PSC) Northern Boundary Technical Committee, North Pacific Anadromous Fish Commissions (NPAFC) Committee on Scientific Research and Statistics (CSRS) and U.S.-Japan Natural Resources (UJNR) Aquaculture Panel involved with salmon hatcheries in Japan. Participating in NPAFC, PSC, and UJNR afforded opportunity for travel to most North Pacific rim countries with populations of salmon including Russia and Republic of Korea . Bill received fre awards for research excellence in fisheries from ADF&G, Alaska Chapter American Fisheries Society, U.S. Department of Commerce Bronze Medal Award, NOAA Fisheries Employee of the Year and NOAA Fisheries Distinguished Career Award. He was an Affiliate Associate Professor, University of Alaska Fairbanks, School of Fisheries and Ocean Sciences.

Figures

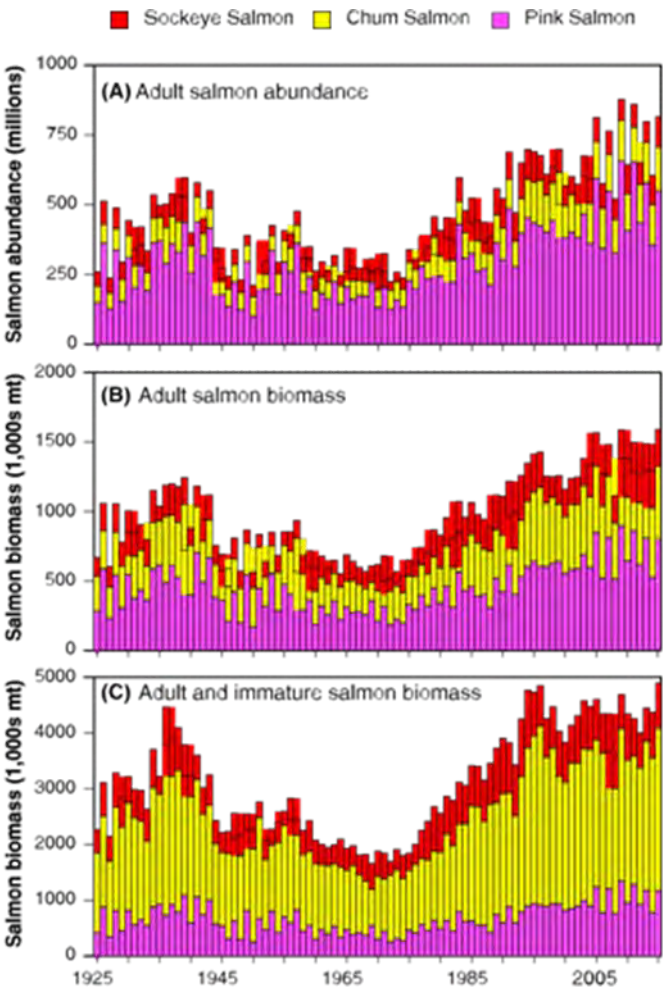

Figure 1. (A) Abundance (millions of fish), (B) adult biomass (thousands of metric tons), and (C) adult and immature biomass (thousands of metric tons) of Sockeye Salmon, Chum Salmon, and Pink Salmon in the North Pacific Ocean, 1925–2015. From Ruggerone and Irvine (2018).

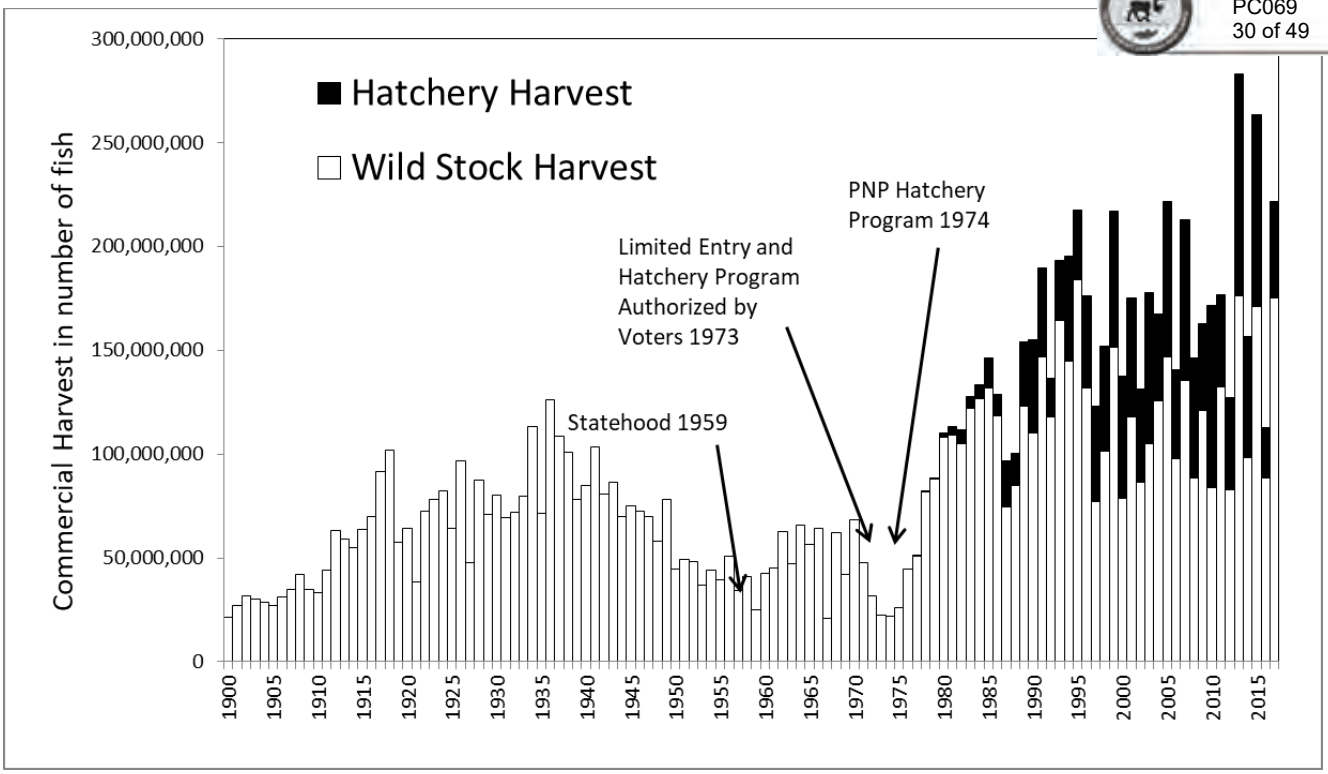

Figure 2. Commercial salmon harvest in Alaska, 1900-2017. From Stopha (2018).

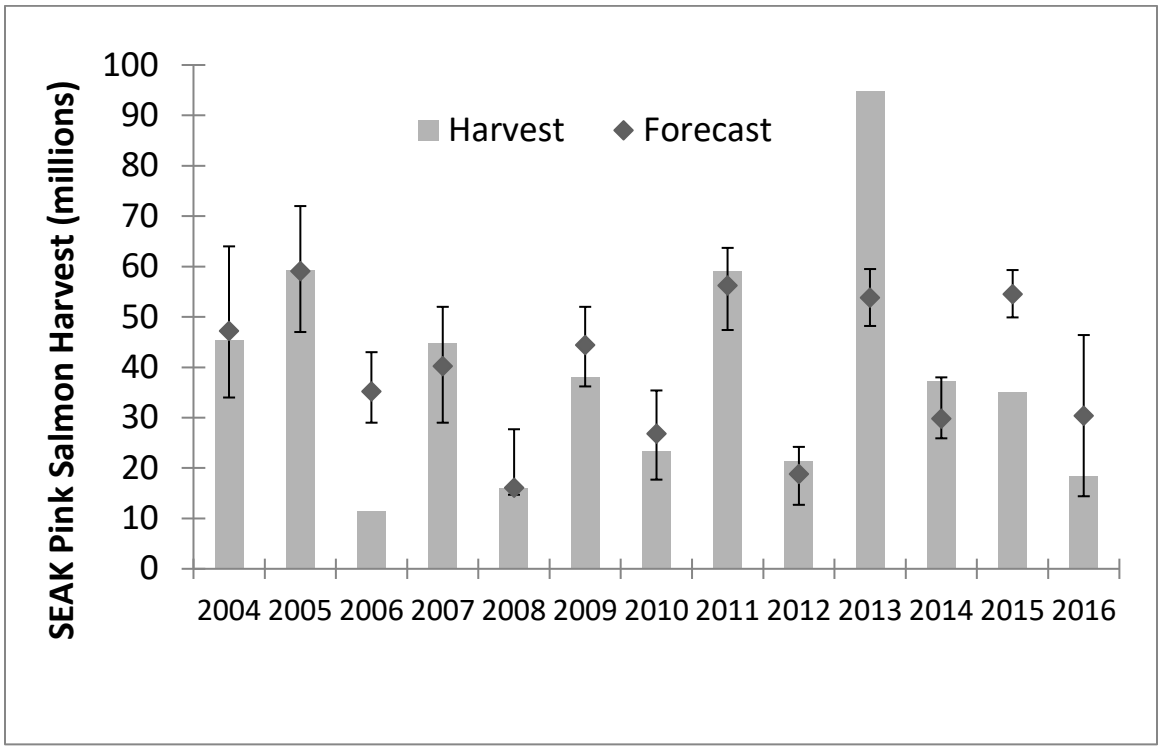

Figure 3.—Southeast Coastal Monitoring (SECM) project pink salmon harvest forecasts for Southeast Alaska (SEAK; symbols), associated 80% confidence intervals (lines), and actual SEAK pink salmon harvests (grey bars), 2004-2016.

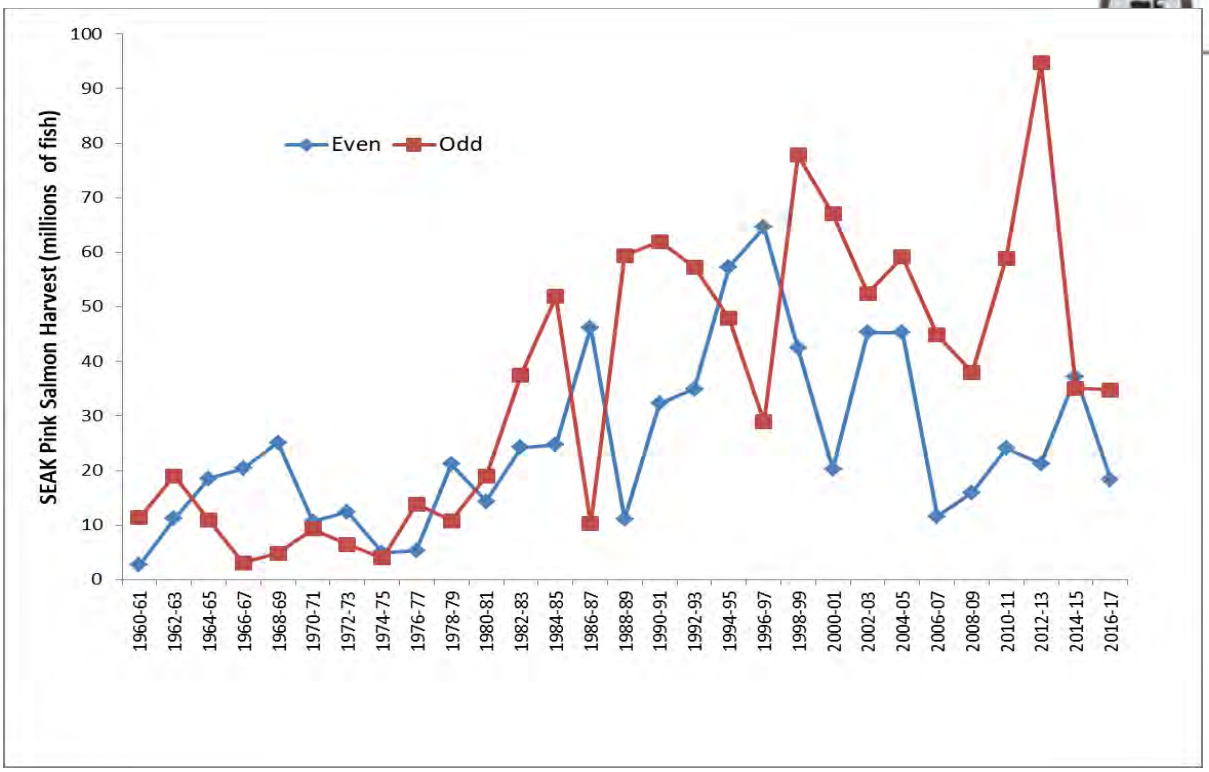

Figure 4. Even- and odd-year harvests of Southeast Alaska pink salmon, 1960-2017. Data are from Alaska Department of Fish and Game catch statistics.

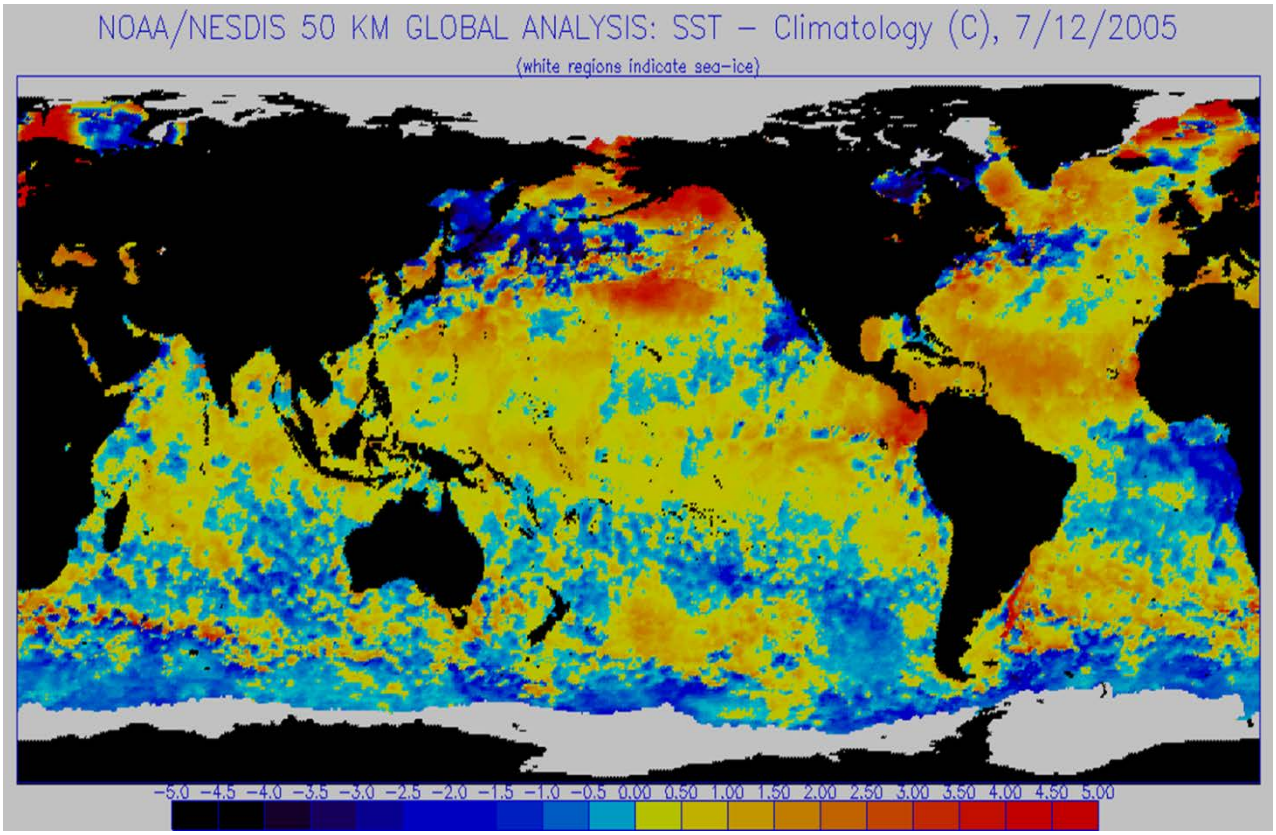

Figure 5. Sea surface temperature anomalies, July 12, 2005. NOAA Satellite and Information Service, National Environmental Satellite, Data, and Information Service (NESDIS) http://www.osdpd.noaa.gov/PSB/EPS/EPS.html

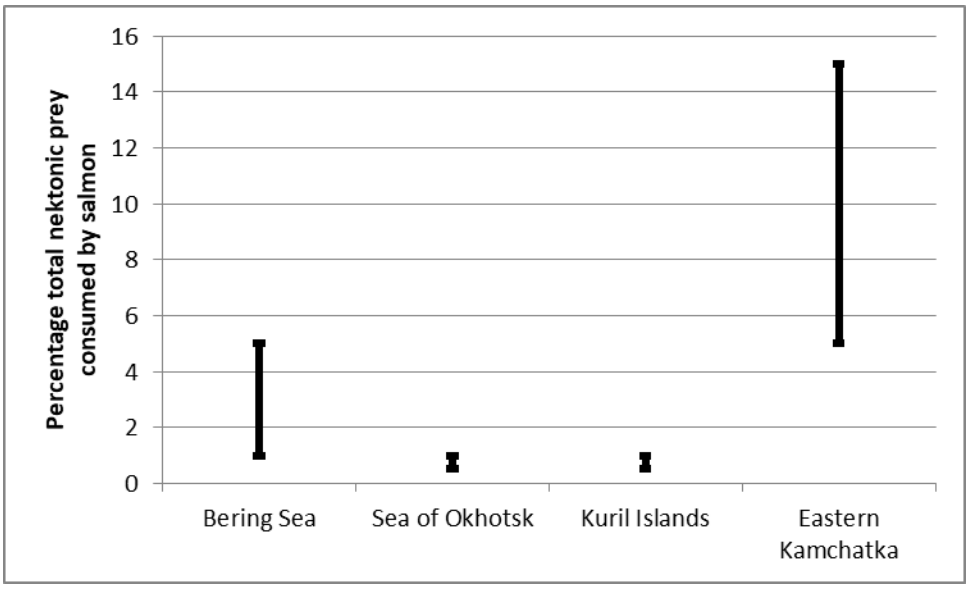

Figure 6. Percentage total nektonic prey consumed by salmon in the western North Pacific Ocean. Estimates are from Shuntov et al. (2017).

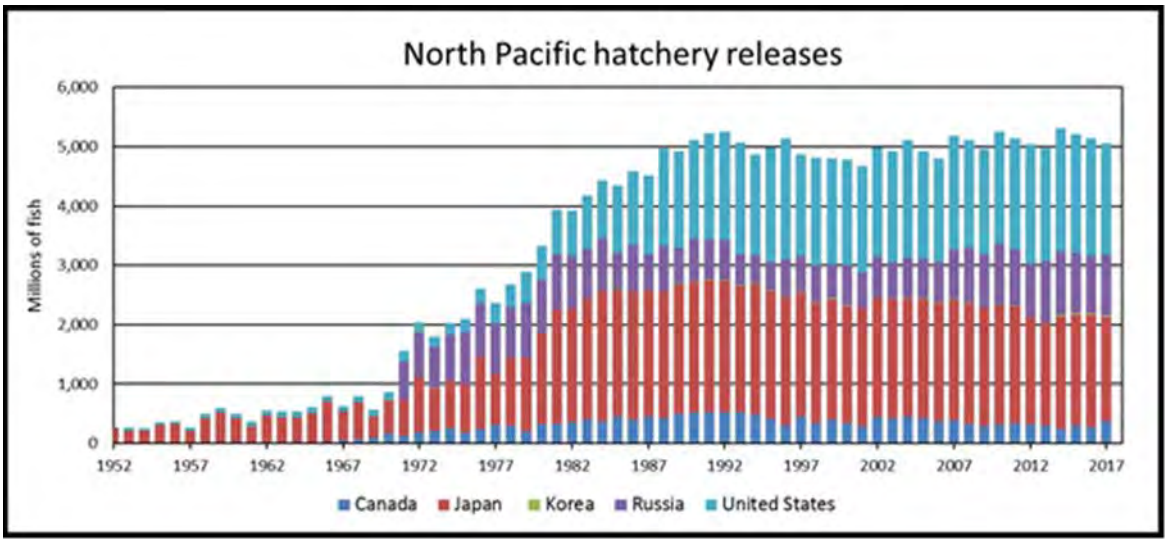

Figure 7. Hatchery releases of salmon into the North Pacific Ocean, 1952-2017. Source: North Pacific Anadromous Fish Commission.

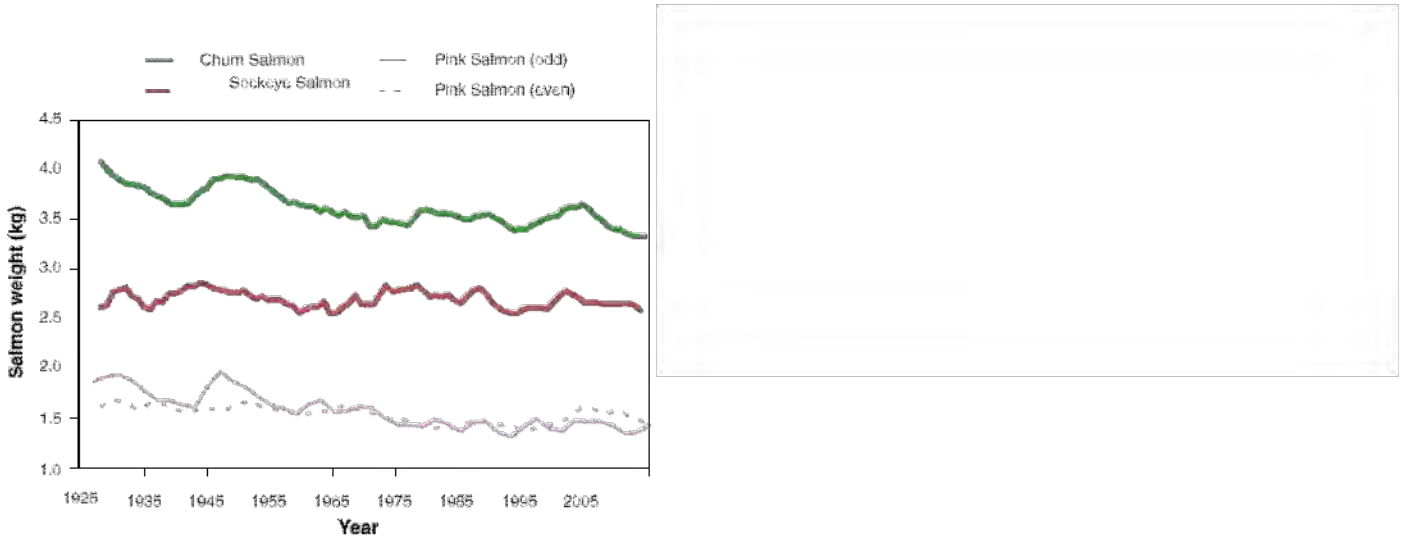

Figure 8. Average weight of pink salmon, chum salmon, and sockeye salmon captured in commercial fisheries, 1925-2015. From Ruggerone and Irvine (2018).

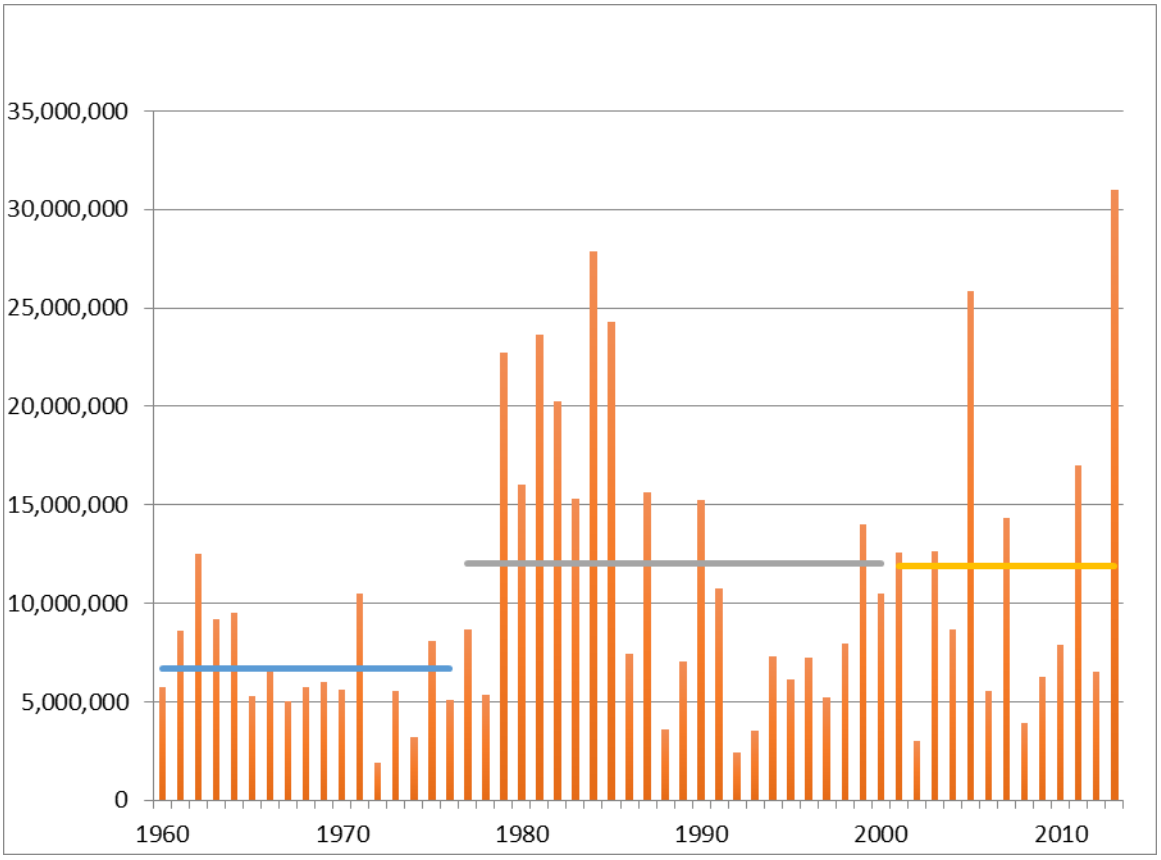

Figure 9. PWS Wild Pink Salmon Production for 1960-2013. Lines indicate average production for pre-hatchery years (1960–1976) and two hatchery time periods: 1977–2000 and 2001–2013. From Gaudet et al. (2017).

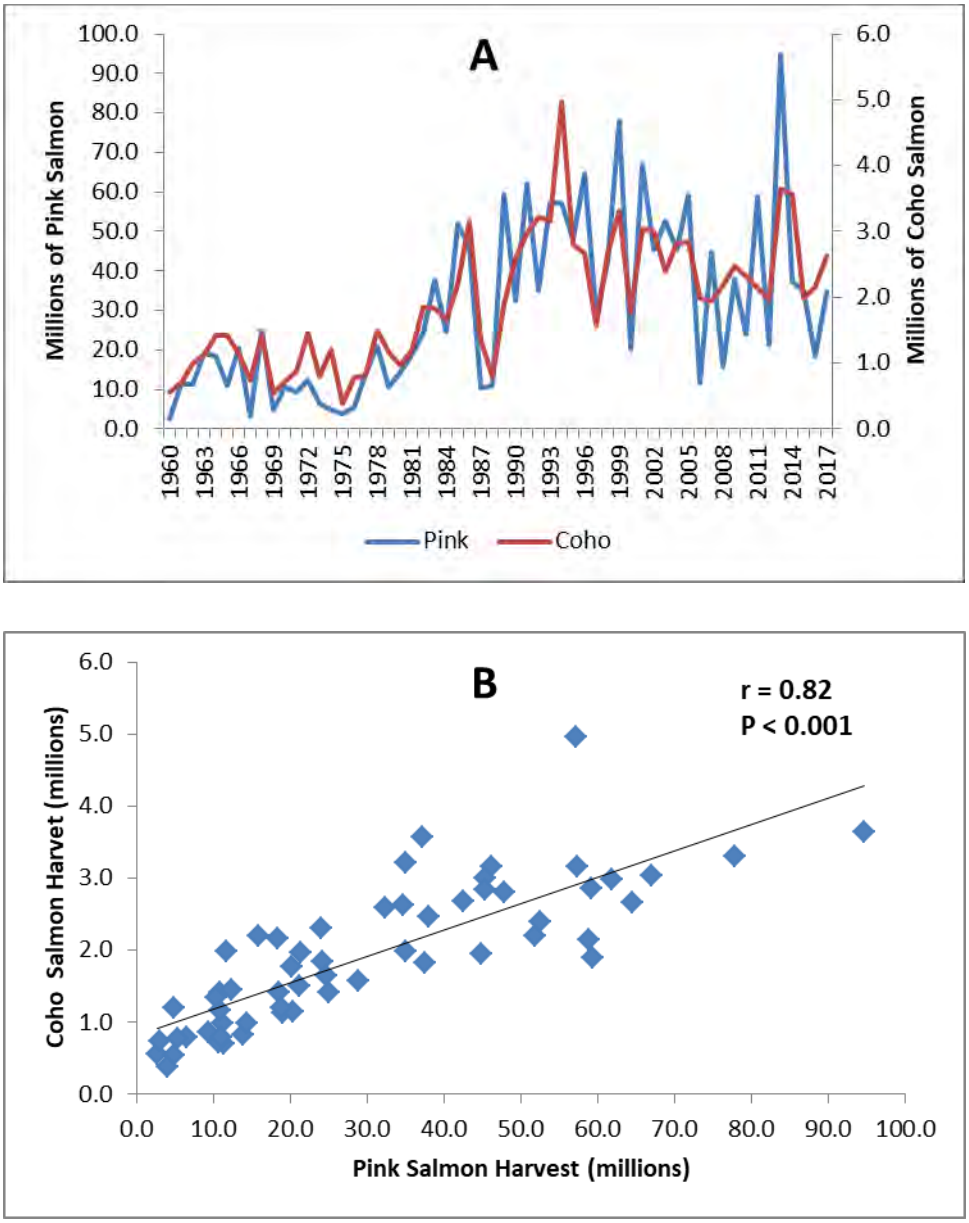

Figure 10. Commercial harvest of Southeast Alaska pink and coho salmon, 1960-2017 (A), and their correlation (B). Data are from Alaska Department of Fish and Game catch statistics.

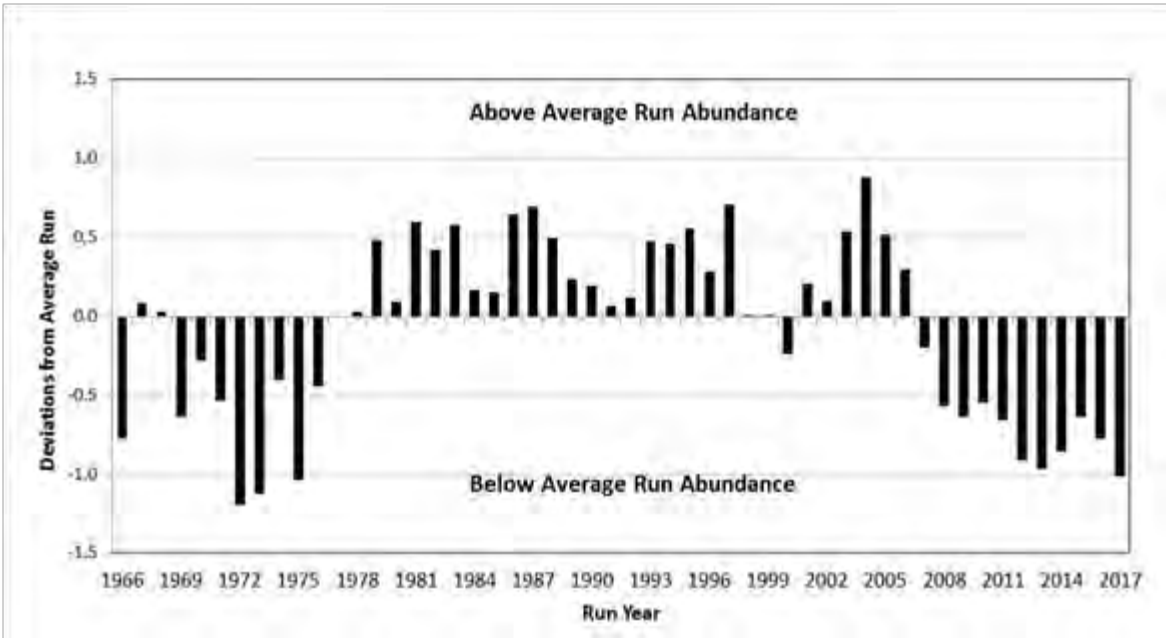

Figure 11–Average of standardized deviations from average run abundance for 21 stocks of Chinook salmon in Alaska (the Unalakleet, Nushagak, Goodnews and Kuskokwim in western Alaska; the Chena and Salcha on the Yukon River; the Canadian Yukon, the Chignik and Nelson on the Alaska Peninsula; the Karluk and Ayakulik on Kodiak Island; the Deshka, Anchor and late run Kenai in Cook Inlet, the Copper in the northeastern Gulf of Alaska, and the Situk, Alsek, Chilkat, Taku, Stikine, and Unuk in Southeastern Alaska). From CTC (2018a).

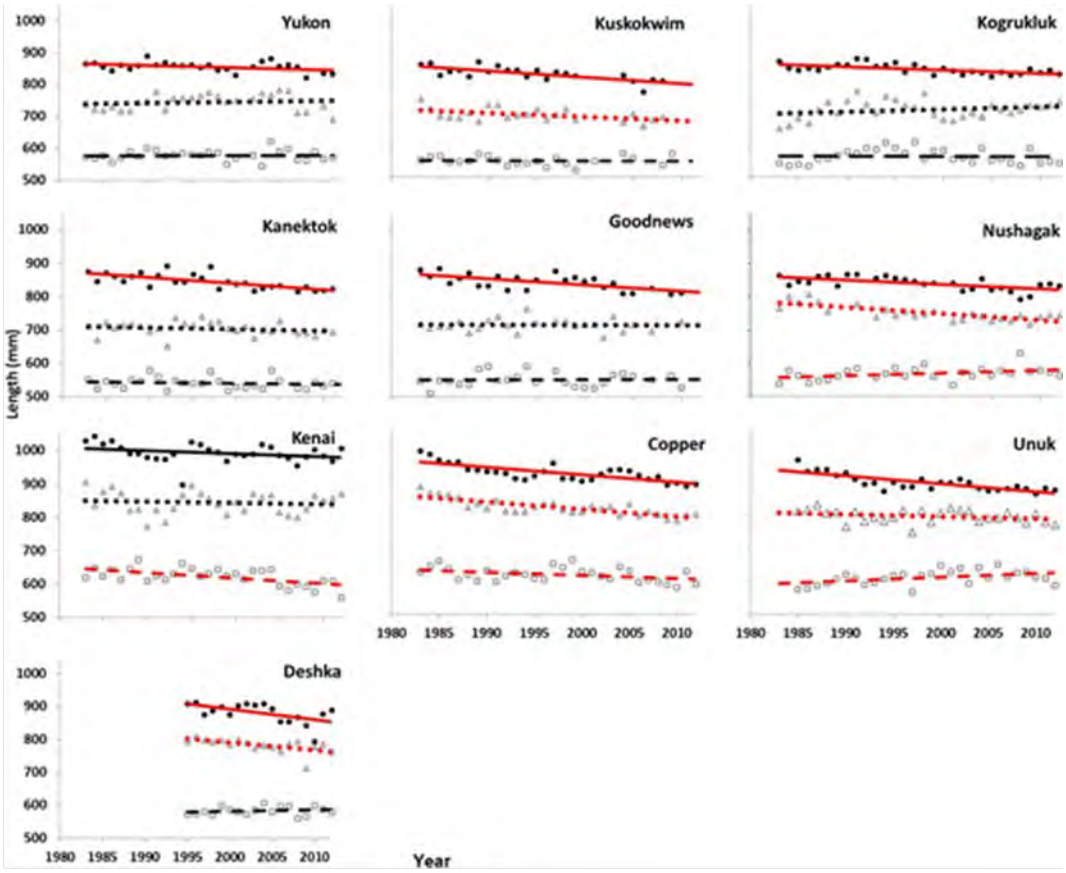

Fig 12. Linear regression of mean annual length (mm) Chinook salmon by stock, age class, and year. Closed circles and solid line = 4-ocean; triangles and dotted line = 3-ocean, open square and dashed line = 2-ocean. Red lines indicate slopes significantly different from zero ($P < 0.05$). From Lewis et al. (2017).

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Ocean Beauty Seafoods LLC

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October 2, 2018

Alaska Board of Fisheries

John Jensen, Chair

Via email: dfg.bof.comments@alaska.gov

Dear Chairman Jensen,

Ocean Beauty Seafoods (OBS) LLC is an Alaskan seafood processor with five processing facilities located in coastal Alaska: Naknek, Alitak, Kodiak, Cordova, and Excursion Inlet. Our company has operated for over 100 years in Alaska. 4 out of the 5 facilities are operate seasonally for the summer salmon runs and rely heavily on pink and chum salmon to provide volume for the plant to run efficiently.

This letter is written in response to ACR-1 and ACR-2 mentioning hatchery production of Salmon. OBS does not support either of these ACR's. Both are aimed at impugning hatchery activities without recognizing ADFG regulatory process for hatcheries or understanding the economic ramifications ARC-2 would impose upon coastal Alaska. We ask the Board of Fisheries to move forward with the Joint Protocol by learning more about the Alaska Hatchery Program through regularly scheduled updates.

Alaska salmon processors compete in a world market that is very competitive. Based on reported catches the Russian pink harvest in 2018 was nearly 8 times as large as the 2018 Alaskan pink catch. Our industry must have volume to support fisherman, tenderman, and processors who depend on salmon to provide for their families. We cannot merely raise prices of salmon processed to offset lost volume because we would be non-competitive with fisheries in other countries. The Alaskan communities where Ocean Beauty operates heavily depend upon commercial harvests of summer salmon runs. Communities with a strong economic foundation are conducive business environments for all associated parties in commercial fishing: harvesters, processors, and vendors for fisheries supplies. Fish produced via hatcheries contribute to economic foundation of these communities.

Economic data compiled by the McDowell Group show:

- Hatcheries account for 4,700 jobs and $218 million in local labor income.
- Income earned from hatchery related harvest reaches more than 16,000 individuals (processors, fishermen, tendermen, and hatchery workers).

When deciding on possible long-term capital investments, a key determining factor is the business foundation of the local community. Hatcheries, through jobs and the fish created, have been contributors to solid community foundations in coastal Alaska. Without the volume of fish that hatcheries produce, the cost of production of all salmon species will increase and the ex-vessel value our fisherman and communities depend on will be lost.

It is common for most to think hatcheries just contribute to commercial harvests. In fact hatcheries have not only enhanced commercial runs, but personal use and sport fish have also benefited. Again referring the McDowell report form 2012-17:

- 17% of sport Coho harvest was of hatchery origin.
- 13% of sport Sockeye harvest was of hatchery origin.
- 8% of sport Chinook harvest was of hatchery origin.

McDowell points out that these numbers are very conservative due to limited sampling. Again hatchery programs in the state of Alaska produce fish that benefit the following stakeholders: commercial, sport, and subsistence.

OBS urges the Board of Fish to continue to take no action on ACR's 1 and 2. OBS supports revisiting the process outlined in the Joint Protocol on Salmon Enhancement #2002-215 FB.

Mark Palmer

Mark Palmer

President/CEO

Ocean Beauty Seafoods LLC

PACIFIC SEAFOOD PROCESSORS ASSOCIATION
Est. 1914

October 3, 2018

Alaska Board of Fisheries
John Jensen, Chair
Via email dfg.bof.comments@alaska.gov

RE: ACR 10 to Close Sitka Sound commercial sac roe herring fishery

Chairman Jensen and Board Members:

Thank you for the opportunity to comment on ACR 10 for the Alaska Board of Fisheries (Board) October work session. As stated, this proposal would close the Sitka Sound commercial sac roe herring fishery until regional herring stock status improves, additional research on herring is conducted, and the amount necessary for subsistence is met in at least three consecutive years. **PSPA opposes ACR 10.**

PSPA is a nonprofit seafood trade association representing seafood processing businesses and their investment in coastal Alaska, including three shorebased processors located in Ketchikan and Sitka. In addition to shorebased processors, fishermen, tenders, support vessels, support businesses, transportation companies, the City and Borough of Sitka, and the State of Alaska (through fish taxes) are dependent on the direct and indirect economic activity that the commercial herring fisheries provide.

PSPA most recently commented on several proposals relevant to this fishery in January, which proposed modifying the existing GHL formula used by ADFG and expanding the closed water areas for the commercial sac roe herring fishery in Sitka Sound. The Board approved an increase to the closed water areas in consideration of subsistence interests at that time, and this is in addition to significant changes made to the fishery by ADFG, the Board, and the commercial herring fleet in order to meet similar concerns in the past several years. The closure was not insignificant, as it closed an additional four miles of fishable waters available to the commercial fishery.

The Sitka Sound sac roe herring fishery alone has generated a total of $70 million in ex-vessel revenue over the last decade, and supports a fishery in which the vast majority of permit holders are Alaska residents. Closing this fishery would substantially impact many fishermen (48 permit holders) and processors reliant on the fishery. These businesses rely on science-based and sustainable fisheries management and are invested in the future of this fishery. ADFG recognizes that current harvest rates for the herring population were designed to be conservative and sustainable based on comprehensive historical data. Variable annual biomass trends are not an indicator of poor management, a stock collapse, or need for a fishery closure, but are accommodated in the existing process to set harvest rates using the best available data. Alaska's commitment to sound science is clear through allowing these data and the expertise of fishery scientists and managers to drive decision-making and regulate fisheries

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appropriately and responsively. In the previous Board meeting, ADFG conveyed that the current harvest strategy is based on the best scientific information available to Alaska and contains conservation provisions to protect herring stocks and their role in the ecosystem.

Absent a scientific basis for doing so, it is not reasonable to approve ACR 10 to allocate the herring resource to one user group, but to continue to use our existing process to determine harvest rates and manage the commercial fishery sustainably and in concert with subsistence needs. Importantly, we must recognize that ADF&G currently manages the herring fisheries to be responsive to the concerns and needs of subsistence users both inside and outside of closed waters, and has not only the authority, but is directed to, distribute the commercial harvest, by time and area, as necessary to ensure a reasonable opportunity to harvest ANS for herring spawn.

Thank you for your consideration of our comments and for your public service.

Sincerely,

Nicole S. Kimball

Nicole Kimball
PSPA – Anchorage

PACIFIC SEAFOOD PROCESSORS ASSOCIATION
Est. 1914

September 27, 2018

Alaska Board of Fisheries
John Jensen, Chair
Via email dfg.bof.comments@alaska.gov

RE: Comment on ACR 1 and 2 regarding hatchery permits

Chairman Jensen and Board Members:

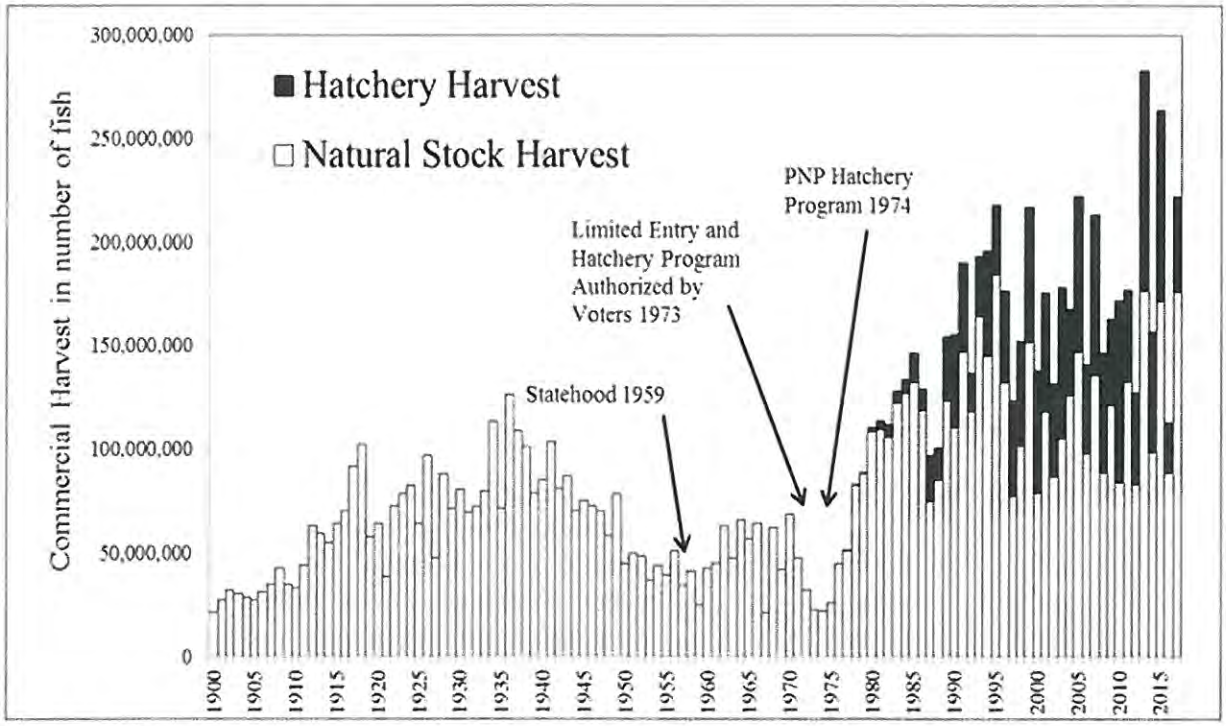
Thank you for the opportunity to comment on two ACRs before the Alaska Board of Fisheries (board) at the October work session. ACR 1 mirrors two previous failed emergency petitions and requests that the board reverse a 2014 ADFG decision to modify an existing permit to allow an increase in the number of pink salmon eggs taken by Valdez Fisheries Development Association (VFDA) at the Solomon Gulch Hatchery in 2018. ACR 2 requests that the board cap statewide private non-profit salmon hatchery egg take capacity at 75% of the level permitted in 2000. **PSPA opposes both petitions and requests that the board not approve the agenda change requests.**

PSPA is a nonprofit seafood trade association representing seafood processing businesses and their investment in coastal Alaska, including three shorebased processors located in Prince William Sound (Cordova and Valdez), four in southeast Alaska (Wrangell, Sitka, Ketchikan), and two in Kodiak. The history and importance of the unique salmon enhancement program in Alaska to these and other communities' stability, as well as the livelihoods of thousands of Alaskans, seems to be lost in the details of the discussion over permitting.

The State of Alaska established the hatchery program in 1971—at a time when Alaska's salmon returns were at historic lows—to provide for more stable salmon harvests and bolster the economies of coastal communities that would not otherwise have viable economies (see figure below). Alaska lawmakers authorized private nonprofit corporations (PNP) in 1976 to operate salmon hatcheries, an exemplary example of state and private partnerships. The state invested significant resources into carefully and deliberately building this program in response to severely depressed commercial fisheries, and it was designed to supplement natural production, not replace it, and to minimize interactions with naturally occurring populations of salmon. Salmon produced by the program remain wild and come from local, wild stocks. Many of these programs are now integral to the Pacific Salmon Treaty which directly affects sport and commercial salmon fisheries of Alaska.

A testament to the program is that commercial pink and chum salmon fisheries improved greatly in response, both wild and hatchery-origin production, which follow similar annual trends (see figures below). **In 2017, the commercial fleet caught about 47 million hatchery-produced salmon worth an estimated $162 million in ex-vessel value.** The program remains a model of success across the nation, both in its design and use of private non-profits to maintain its objectives at very little cost to the state.

It is for these reasons that it seems incomprehensible to undermine this critical piece of our coastal, fisheries economy in response to specious claims, and create additional regulatory and operational instability for Alaska fishery businesses.



Source: ADFG.

Hatchery pink and chum salmon are crucial for Prince William Sound and Southeast processors because they represent the volume necessary to keep plants operating, in addition to wild stock salmon and other species such as halibut, black cod, and Pacific cod. Only in this way can they remain viable and provide markets not just for salmon fishermen, but for all other commercial fishermen. Processors and harvesters have made significant long-term investments in processing plants and their fishing businesses, respectively, based on this program and permitting decisions. In addition, tenders, support vessels, support businesses, transportation companies, sportfish businesses, and community governments (through fish taxes) are just as dependent on the direct and indirect economic activity that the hatchery programs provide.

Per ACR 1, Seward, Valdez, and Cordova have multiple large and small seafood processing operations, and VFDA directly benefits harvesters and processors in the region by providing a relatively stable supply of pink salmon. The commercial fishery brings over 900 seine captains and crew members to Valdez for the VFDA pink fishery, and hundreds more processing workers. In 2017, 28.5 million hatchery-produced salmon harvested in the Prince William Sound commercial common property fishery accounted for 57% of the total common property commercial catch in the region, with an ex-vessel value of about $76 million. This is in addition to the sport and subsistence harvests of hatchery-origin salmon that occur in the region. A recent McDowell report (2018) indicates Prince William Sound hatcheries account for 2,200 jobs, $100 million in labor income, and $315 million in total economic activity.

ACR 1 is the same petition previously addressed by the board, which did not demonstrate that the approved increase in 2014 of the number of pink salmon eggs to be harvested in 2018 was an unforeseen, unexpected event that threatens a fish or game resource per criteria under 5 AAC 96.625(f). ADFG demonstrated this in letters to the petitioners as of May 10 and June 14, and in responses to the board, and the board agreed. Now that emergency criteria are no longer applicable, submitters continue to ask the board to undo an action in 2014 that underwent a rigorous and public process driven by the Alaska Sustainable Salmon Policy.

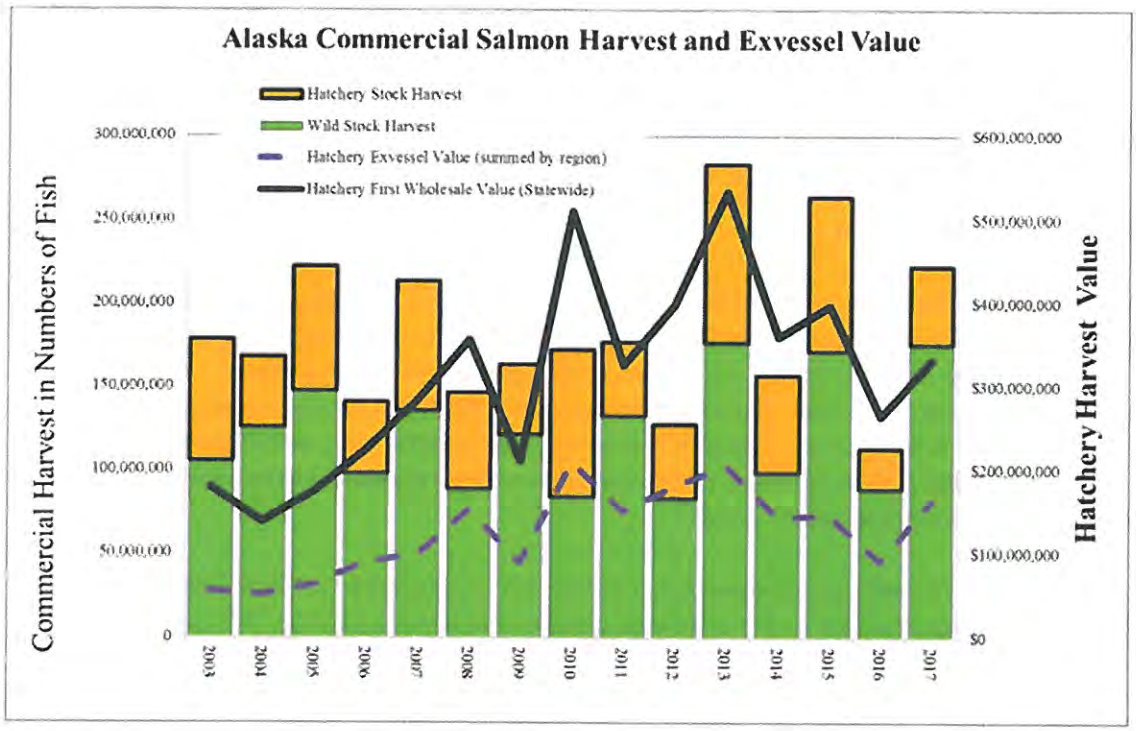


Figure 4.–Hatchery and wild stock harvest in numbers of fish and the estimated exvessel and first wholesale value of the hatchery fish harvest, 2003–2017.

An increase of 20 million eggs in 2016 and 2018 was approved in 2014 as an incremental increase over a four-year period, with no previous production increases since 1991. The approval of the permit alteration in 2014 recognized that policies and regulations were adopted to mitigate concerns associated with straying of hatchery fish, and significant, multi-year, inter-agency research implemented by the Prince William Sound Science Center and Sitka Sound Science Center has been underway to determine the degree to which hatchery pink and chum salmon straying is occurring, including the range of interannual variability in the straying rates, and an examination of the genetic structure of pink and chum salmon in Prince William Sound and Southeast Alaska and the impact on productivity of these salmon.[1] This research is a direct response to the value that hatchery production provides to Alaska and the mandate that hatchery production be compatible with sustainable productivity of wild stocks, and thus was instigated and supported by ADF&G, the university, the fishing industry, and private hatchery operators. The research plan and objectives were developed by a science panel with broad experience in

[1] http://www.adfg.alaska.gov/index.cfm?adfg=fishingHatcheriesResearch.current_research

salmon management, and wild and hatchery interactions, comprised of current and retired scientists from ADF&G, the University of Alaska, aquaculture associations, and National Marine Fisheries Service. Annual progress reports on data collection and analysis are provided on the ADFG website relating to the three overall research objectives described above. For example, PWS field research in 2017 was focused on pink salmon fitness (relative survival of hatchery-origin and wild-origin offspring following natural spawning). The final 2017 report on PWS pink salmon fitness was published in late April 2018, which indicates that hatchery fractions calculated for 2017 were overall generally consistent among high run years for pink salmon in sampled streams in PWS (2013, 2015, and 2017).[2] The report also notes that results comparing the relative survival of hatchery and wild-origin offspring will be available after the last PWS pink salmon field season in 2018 and subsequent DNA tissue analyses are completed in 2019. This is the type of recent, credible, long-term scientific information that should be relied on in assessing impacts of the state's hatchery program. And this *is* the type of information that is relied on by ADFG in an extensive, continuous permitting process that includes public participation and a thorough vetting of hatchery operations for fish health, impacts to fisheries management, and potential genetic interaction with naturally spawning stocks.

Per both ACRs, it should also be recognized that the benefits of the state's salmon enhancement program are wide-reaching and include commercial, sport, personal use, and subsistence fishermen and Alaska communities dependent on fishing. **All of the private non-profits (PNPs) have programs that benefit sport, personal use, and subsistence fisheries, particularly their Chinook, coho, and sockeye salmon programs. Sport fish directed programs are conducted by PNPs from Ketchikan to Kodiak, and on average, about 272,000 Alaska hatchery salmon were harvested annually in the sport and related fisheries during 2012 – 2017** (McDowell, 2018).

The 2017 Alaska Salmon Fisheries Enhancement Annual Report[3] produced by ADFG indicates that in 2017, hatchery fish contributed 21% of the statewide commercial salmon harvest. This is a significant contribution to Alaska's salmon fisheries, even while it is the lowest percentage of hatchery fish in the harvest since 1995. This low percentage was due largely to a very high wild stock harvest that was the 3rd highest in Alaska history (the report notes that 2013, 2015, and 2017 were three of the four highest wild stock returns in Alaska's history dating back to the late 1800s).

Recent economic studies[4] have shown that during 2012 - 2017:

- Commercial fishermen harvested an *annual* average of 222 million pounds of hatchery origin salmon worth $120 million in ex-vessel value.
- Hatchery derived first wholesale value represents 24% of total statewide salmon first wholesale value.
- About 10,000 hatchery origin Chinook, 5,000 chum, 100,000 coho, 19,000 pink, and 138,000 sockeye salmon are harvested annually in sport and related fisheries.

[2] http://www.adfg.alaska.gov/static/fishing/PDFs/hatcheries/research/2017_annual_report_pwssc_hw.pdf
[3] http://www.adfg.alaska.gov/fedaidpdfs/rir.5j.2018.02.pdf?_ga=2.16801777.93909972.1530292352-686289217.1523643770
[4] Economic Impacts of Alaska's Salmon Hatcheries, McDowell Group, 2018.

- Alaska's salmon hatcheries account for the *annual equivalent* of 4,700 jobs[5], $218 million in labor income, and $600 million in annual economic output.
- More than 16,000 fishermen, processing employees, and hatchery workers can attribute some portion of their income to Alaska's salmon hatchery production.
- Southeast Alaska hatcheries account for 2,000 annualized jobs, $90 million in labor income, and $237 million in total annual economic output.
- Prince William Sound hatcheries account for 2,200 annualized jobs, $100 million in labor income, and $315 million in total annual economic output.

We appreciate that the board has provided a review and discussion of ADFG's hatchery program for this October work session, and we hope that the board seriously considers the long-term and local effects of these ACRs, and general, non-defensible opposition to a program developed over time to sustain Alaska's salmon economy. Alaska's commercial fisheries have been sustainable and diverse over time because of our commitment to sound science through the use of best available data and the expertise of our fishery scientists and managers to develop and implement needed research to regulate fisheries appropriately. ACRs 1 and 2 undermine this process by asking the Board to override an existing regulatory process and ADFG expertise with respect to the management of hatchery permitting and production levels.

Please continue to uphold the overarching tenets of Alaska's fishery management system and recognize a state program driven by sound science that provides widespread benefits to Alaskans. Please deny ACR 1 and 2, and do not support any action that undermines Alaska's world-class hatchery program.

Thank you for your consideration and your public service.

Sincerely,

Nicole S. Kimball

Nicole Kimball
PSPA - Anchorage

[5]The employment impact of 4,700 jobs is an annualized estimate; the number of people who earn some income from the harvest of hatchery salmon is 16,000, several times the annual average.

Submitted By
Peter Hamre
Submitted On
10/2/2018 8:45:33 AM
Affiliation

Dear Members of the Board of Fisheries,

I'd like to take this opportunity to comment on the two Agenda Change Requests relating to hatchery production of pink salmon in Prince William Sound. A bit about me – last year I bought a seine vessel and permit in the Sound, and thus began my career as a captain. I'm a lifelong Alaska resident, and have been a commercial and sport fishing advocate since my late teens.

The Agenda Change Requests proposed are indicative of a knee jerk reaction by sport fishing advocates who are, understandably, upset about King Salmon returns to the Kenai river. King Salmon have been declining statewide for over a decade, yet there is no solid evidence that pinpoints the causation of this decline on increased pink salmon. Simply put, there are likely a few reasons for their decline, some of which are in our control, some of which are not.

We are seeing the effects of climate change starting to make major impacts on many of our fisheries, yet there are very few studies available to model the effects upon wild and hatchery raised salmon. Last year saw an 80% reduction in the TAC for Gulf of Alaska cod, which was colloquially blamed on the warm water "blob," and its effect on available forage. At the same time, the last three odd years have produced the strongest WILD salmon runs in our state's history; Area M saw more wild fish than could even be accurately counted. Simply put, it is entirely conceivable that climate change has been an underreported causation of the decline of King Salmon. It's also conceivable that the user group that brought this action forward would assign less authority to a report that linked climate change and declined King salmon returns, because many of their top contributors are known climate change deniers.

The Kenai River Sportfishing Association is an advocacy group that is hell-bent on destroying commercial fisheries in Alaska. They routinely post false or misleading reports to sway ordinary citizens who, as recreational fisherman, are generally somewhat un-educated about fisheries management and science. There is a LOT of things that we can do to improve King salmon returns in Alaska that KRSA hasn't supported or initiated. Why? Because they simply don't want commercial fisherman around. Let me give some examples of other ways that we can boost King salmon returns, that haven't been pursued by KRSA:

1. The State could advocate for NMFS to adopt full electronic monitoring for the Pollock fleet in western Alaska. This would reduce the amount of un-reported or un-retained bycatch, and give them more accurate bycatch caps. Also, NMFS could allow the Pollock fleet to throw back viable salmon that could potentially survive, yet still mark them as bycatch. The commercial fleet WANTS to improve survival of King salmon, yet regulation prohibits them from doing so. This is a real solution that would actually improve King salmon survival, but yet here we are, talking about hatchery pink salmon as if they have single-handedly destroyed King salmon runs.
2. The State could reduce the bag limit of sport-caught King salmon in some areas. There are still areas where the bag limit is 2 per day, all year long. What citizen needs to catch 730 Kings per year? That's one person, making an enormous impact on the resource, with minimal economic impact. We shouldn't downplay the likelihood that this is occurring; it is happening, and I know of people that really make impacts like this. Once again, KRSA and sportfishing advocates turn a blind eye.
3. Adopt regulations that make it illegal to retain King salmon in all state water commercial fisheries in which King salmon are not the target species. King salmon amount to a negligible amount of the catch in most commercial salmon operations, yet are causing major political problems for us. Why not make it illegal to retain them at all? I personally throw all King salmon back into the ocean the minute the seine is rolled aboard, as do many other commercial fishermen. A good percentage of these fish will survive and make the resource stronger.
4. Ban Cook Inlet gillnetters from retaining Kings for home pack. This is a no-brainer. Home pack Kings are grossly under-reported in Cook Inlet, and this needs to change.

In summary of these bulletins, there are many achievable modifications to existing law that would actually improve King salmon returns in a demonstrable way, yet KRSA is proposing that somehow, hatchery pink salmon are the single greatest threat facing King salmon and it isn't worth their time to try to boost King salmon numbers in other, more concrete ways.

Let me address the economics of this proposal. There are around 240 seine vessels fishing in the Sound, each with four to six people working on them. Many of those people support a family, meaning that the seine fishery supports thousands of people, and that's only the

fisherman, not to include the processors, and many others involved in the chain of supply. Reducing the egg take to 75% of 2000 levels would have a disastrous impact on the fishery. We would witness the failure of more than half of the fleet, which would cause a crash of commercial fishing in general in Alaska, as many of the participants are involved in multiple fisheries. Simply put, if the fishery in Prince William Sound is to exist at all, we need robust hatchery returns.

There is also the issue of the whole economy of Alaska. Seiners in the Sound are overwhelmingly Alaska residents, meaning every dollar they make gets poured back into the Alaskan economy, as does the income of their deckhands. We cannot say the same of sportfishing guides on the Kenai, many of whom are out of state, and many of whom don't make enough money to create a meaningful impact upon our economy. It has always been a priority of this state to encourage the proliferation of Alaska resident commercial fisherman, and this focus has made this industry the third strongest in the state. It would be grossly negligent to pull the rug out from under these fisherman, all of whom are heavily capitalized and invested in their industry.

In summary, I urge the Board of Fisheries to reject these Agenda Change Requests. If these are allowed to move forward, not only will thousands of people lose their well-paying jobs, but a dangerous precedent will be set upon some incredibly shaky science. This is not the way we as a state should manage our fisheries.

PETERPAN SEAFOODS, INC.

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BELLEVUE, WA 98004-8001
206.728.6000
OPERATION FAX 206.441.9090
SALES FAX 206.728.1855

September 27, 2018

Alaska Board of Fisheries
John Jenson, Chair
Via email dfg.bof.comments@alaska.gov

RE: ACR 1-Prohobit Valdez Fisheries Development Association from incubating, rearing, and releasing pink salmon resulting from additional egg take capacity permitted in 2018 and cap egg take capacity at the level permitted in 2017 (5 AAC 24.366). and ACR 2-Cap statewide private non-private salmon hatchery egg take capacity at 75% of the level permitted in 2000 (5 AAC.40.XXX).

Dear Chairmen Jenson and Board Members:

Thank you for the opportunity to comment on Agenda Change Request 1 (ACR 1) and Agenda Change Request 2 (ACR 2) put forth pursuant to the Alaska Board of Fisheries Work Session on October 15th and 16th. **Peter Pan Seafoods, Inc strongly opposes ACR 1 and ACR 2.**

Peter Pan Seafoods is a long-standing processor of Alaska's seafood. We have processing facilities in King Cove, Port Moller, Dillingham and Valdez as well as fisherman support facilities at Sand Point, False Pass and Naknek. We have been processing in Prince William Sound since 1988. Our operations are intricately tied to and supported by the communities in which we reside. The health of these communities and our industry is dependent on sound management that protects the health of Alaska's fishery resource.

KRSA submitted an agenda change request to Prohibit Valdez Fisheries Development Association from incubating, rearing, and releasing pink salmon resulting from additional egg take capacity permitted in 2018 and cap egg take capacity at the level permitted in 2017 (5 AAC 24.366). All private non-profit hatchery permit alterations regarding hatcheries in Alaska, including that by VFDA of a 20 million additional egg take, follow a vetted and transparent public process. Each request is reviewed by a panel of industry members from ADF&G, hatchery organizations, and private industry members to provide a recommendation whether to approve or deny the alteration. Each industry member thoroughly reviews the potential impacts the permit alteration could have on the fishery locally, as well as the surrounding fisheries.

The Alaska Hatchery Research Project, funded in partnership with the state, hatchery organizations and the processing industry, is a groundbreaking study to provide conclusion to many unanswered questions regarding salmon in Alaska. Specifically, the interaction between wild and hatchery raised pink and chum salmon. The three major questions to be answered are the current status and effects of the genetic stock structure, straying of hatchery bred salmon, and overall impact on fitness of wild pink and chum salmon. This study takes years to collect, review, and conclude the findings. To assume the interaction of wild and hatchery bred salmon is harmful before the results have been released is not using sound judgment or decision making. ACR 1 and ACR 2 rely solely on assumptions and are not scientifically supported.

ACR 1 and ACR 2 potentially have remarkable economic impacts directly effecting the harvesting and processing sectors, as well as communities. Over 900 captains and crew are in Valdez during the period when the fishery is targeting VFDA pinks. All engaged in the fishery are supporting the grocery stores, hardware stores, and restaurants in the community. This activity is synonymous for all communities that benefit from hatchery production throughout Alaska. To reduce and destroy hatchery production that has already been approved through a public and transparent process would be detrimental to the communities and livelihoods of the individuals that rely on these fisheries.

Peter Pan Seafoods, Inc thanks you for your consideration and encourages you to oppose ACR 1 and ACR 2.

Sincerely,

Mike Simpson
Dir. Of Alaska Operations

Prince William Sound Aquaculture Corporation
DEVELOPING SUSTAINABLE SALMON FISHERIES FOR ALASKA AND THE WORLD

October 1, 2018

Alaska Dept. of Fish & Game
Alaska Board of Fisheries
PO Box 115526
1255 W. 8th Street
Juneau, AK 99811
Via email: dfg.bof.comments@alaska.gov

RE: Oppose ACR 1 & ACR 2, Board of Fisheries Work Session October 16-16, 2018

Dear Chairman Jensen and Board Members,

The Prince William Sound Aquaculture Corporation (PWSAC) is a regional nonprofit hatchery organization operating five hatcheries, four on the westside of Prince William Sound and one on the Gulkana River, raising all five salmon species. Three of the hatcheries operated by PWSAC are owned by the State of Alaska, and operated under professional service agreements.

Two ACR's regarding hatchery production have been submitted for board consideration. PWSAC does not support either of the ACR's, and encourages the Board of Fisheries to instead schedule regular updates on hatchery production, permitting, scientific research, and fishery contributions as part of the regular three-year cycle.

PWSAC was founded in 1974 by local fishermen to support the regional economy after several years of low salmon returns prevented commercial fishing. The organization is governed by a board of forty-five members who represent diverse users. Our board has representation from the following groups:

- Commercial Fishermen (Seine, Drift Gillnet and Set Gillnet)
- Sport Fishermen
- Subsistence Fishermen

- Personal Use Fishermen
- Prince William Sound Municipalities
- Alaska Native Organizations
- Scientists
- Salmon Processors

Today, PWSAC is Alaska's largest hatchery organization employing 45 full time staff members and 75 seasonal workers located in Cordova, Anchorage and at our remote hatcheries in Prince William Sound and Gulkana. The organization has a total budget of $14.2 million which is funded by salmon enhancement taxes and cost recovery fish sales. PWSAC employs many professionals with advanced scientific degrees, while simultaneously providing early career opportunities for those interested in fisheries science and management. Salmon reared by PWSAC are harvested by all user groups in Prince William Sound and on the Copper River including commercial, sport, personal and subsistence users.

Economic data from 2017 compiled by the McDowell Group, indicates that PWSAC has a total economic impact of $192 million annually, supporting 1,405 jobs. On Average, PWSAC produces $49 million in ex-vessel value annually and $122 million in first wholesale value. Fish from PWSAC operations are harvested by sport, personal use and subsistence fishermen. The primary species harvested by these user groups are coho, sockeye, king and chums. From 2012-2017 over 40,000 cohos were harvested, which is equal to roughly 2,200 daily bag limits annually. Sockeye are harvested in abundance by these user groups with a total of 54,000 fish harvested annually. Residents from Fairbanks, Anchorage, Mat-Su and Copper Valley are the primary beneficiaries. Assuming an average family of four eats 40 sockeye per year, this means nearly 5,400 Alaskans eat PWSAC produced sockeye annually.

According to a recent study by the McDowell Group, the Alaska Hatchery Program has a significant economic impact statewide, supports residents in many coastal communities as well as Anchorage, Mat-Su and Fairbanks, and benefits all user groups. Hatchery production statewide provides $120 million in ex-vessel value annually, with over $361 million in first wholesale value. The total economic impact from this production is estimated at $600 million and supports 4,700 jobs statewide. A total of 16,000 fishermen, processing employees and hatchery employees can attribute a portion or all their income to hatchery operations, with thousands more in the support sector benefiting from this production. Other user groups also benefit from hatchery production. Due to limited data collection on sport, personal and subsistence users it is currently estimated that 10,000 Chinook, 5,000 Chums, 100,000 Coho, 19,000 Pink and 138,000 Sockeye are harvested annually by these user groups.

ACR 1- *Prohibit Valdez Fisheries Development Association from incubating, rearing and releasing pink salmon resulting from additional egg take capacity permitted in 2018 and cap egg take capacity at the level permitted in 2017.*

This topic has been before the board of fisheries several times in 2018. Multiple emergency petitions have been filed and each has been rejected by both ADF&G and the board. As noted in previous discussions regarding this topic, the concerns raised by the supporters have been around since the inception of the program. These concerns have been addressed through out the history of the program with ADFG scientists and others. This approach by supporters is an attempt to subvert the ADF&G's regulatory process and authority which is based on science and applies a precautionary principle in setting hatchery policy.

The basis for this request appears to come from a recent paper title "Numbers and Biomass of Natural and Hatchery Origin pink salmon, chum salmon, and sockeye salmon in the North Pacific Ocean 1925-2015" which

discusses salmon populations in the Pacific. The paper highlights that pink salmon are the most abundant species in the Pacific, representing 67% of the adult biomass. The paper also states that hatchery production of pink salmon represents only 15% of the pink salmon in the Pacific while natural-origin production is high due to favorable ocean conditions. Natural-origin pink salmon make up 85% of the pink salmon in the Pacific, and of those over 55% come from Russia which is the largest producer of pink salmon. In total, hatchery origin salmon represent 28% of the total adult biomass according to the study when accounting for all species.

The paper does not conclude that hatchery pink salmon production should be reduced or indicate that doing so would in any way improve marine survival for either wild pink salmon or other salmon species. We are unable to follow the logic of the proposers, which seems to be that Alaska should give up very significant benefits to commercial, sport, subsistence, and personal use fishermen and Alaskan communities for no discernable benefit. Even the papers cited by the proponents don't support tor suggest the actions proposed. The paper makes the following recommendations: 1) Mark or tag hatchery salmon so that they can be identified after release, 2) estimated hatchery and natural-origin salmon in catches and escapement, and 3) maintain these statistics in publicly accessible databases. These recommendations are already incorporated into the Alaska Hatchery program.

ACR 2- *Cap statewide private non-profit hatchery egg take capacity at 75% of the level permitted in 2000.*

ACR 2 fails to define any fishery conservation purpose or reason for the request. The implications of this sort of drastic action are far reaching and would have a significant impact on the Alaska seafood industry and all users of the salmon resource.

PWSAC production levels stabilized in 1981 and have remained relatively stable for many years. In 1997, PWSAC was permitted to take 566 million pink salmon eggs; today PWSAC is permitted to take 525 million pink salmon eggs, a 7% ***decrease*** over the last 30 years. There have been several changes in permits over the years and actual annual production varies depending on whether egg take thresholds are met. If adopted, ACR 2 would reduce PWSAC's current egg takes by 37% overall spread across pink salmon (34%), chum salmon (50%), sockeye salmon (29%), coho salmon (25%) and king salmon (25%).

The overall economic impact from these changes would be significant. Due to the multiple species and users enumerating the exact impact is difficult. However, the ex-vessel value of PWSAC produced fish would decline by $17 million. Further, there would be a 25% reduction in the number of sockeyes harvested in the Copper River personal use fishery that would equate to roughly 13,500 fish.

As addressed in previous comments provided to the board, the issue of carrying capacity of the Pacific Ocean is broad and complex. There are many comments that have been submitted addressing the complexity of this question and summarizing the information available. North Pacific Anadromous Fish Commission (NPAFC) is a international body that addresses overarching questions regarding salmon production in the Pacific. Their body is made up of scientific representatives from all countries in the Pacific producing hatchery salmon. We encourage the board to become familiar with the research findings from the NPAFC as a first step towards understanding the current scientific consensus on such issues.

Alaska's hatchery program has been in place for decades and has successfully provided opportunity for all user groups, reduced pressure on wild stocks, and avoided harm to wild stocks through rigors and scientific permitting process led by

ADF&G. This process provides for public input and is the established forum for regulating hatchery p
concerned that efforts by interest groups to insert politicize a long-standing program will be costly, duplicative, and disruptive to a program with far reaching benefits to Alaskans and the salmon resource. It is imperative that the hatchery program continue to be regulated and managed on a scientific basis. Hatcheries have long planning cycles for operational and capital needs, and sudden unforeseen changes in production due to politics may result in financial harm to the entities as well as the users.

We've attached to our submission as an appendix comments submitted by PWSAC counsel Ashburn & Mason for the July 17th meeting in PC012. These comments are important, as it should be recognized that the legal authority of the Board of Fisheries with respect to the hatchery program has limitations.

PWSAC supports efforts by the Alaska Board of Fisheries to better understand the Alaska Hatchery program. To this end, we look forward to providing detailed information during the future meetings as appropriate. The topic is complex, requiring diligence when reviewing potential changes. **We urge you to take no action on ACR #1 and ACR #2**

Sincerely,

Casey Campbell

General Manager/CEO

Prince William Sound Aquaculture Corporation mission statement: *"To ethically and professionally optimize salmon production in Area "E" for the long-term well-being of all user groups."*

Appendix:

"Economic Impact of the Prince William Sound Aquaculture Corporation, *September 2018*"

"Public Comments of Ashburn & Mason, P.C, Counsel for Prince William Sound Aquaculture Corporation in Opposition To May 16, 2018 KRSA et al. Emergency Petition Regarding VFDA Hatchery Production, *July 9th 2018*"

Economic Impact of the

Prince William Sound Aquaculture Corporation

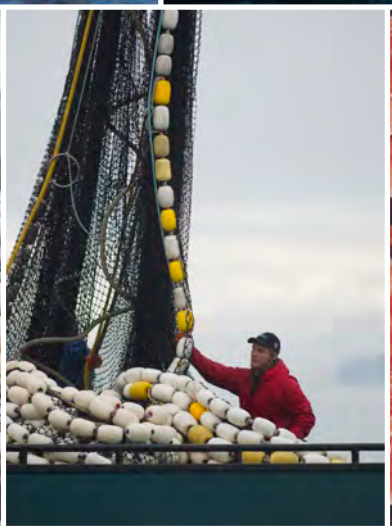
September 2018

Prepared for
Prince William Sound Aquaculture Corporation





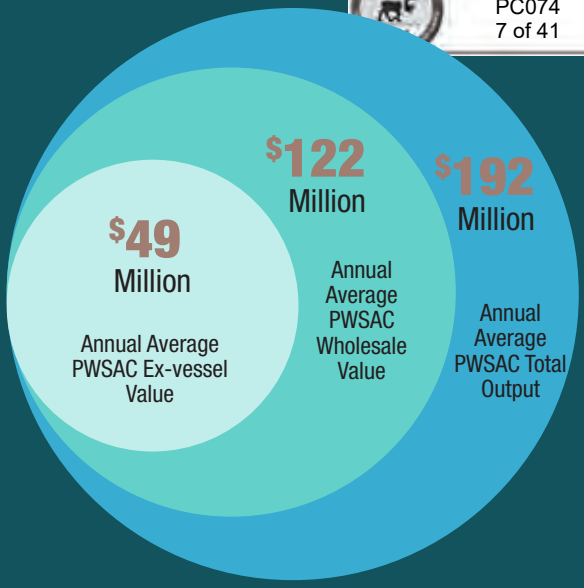

Prepared by
McDowell GROUP



By the Numbers

Prince William Sound Aquaculture Corporation

2012-2017



539 million pounds	Cumulative common property harvest volume of PWSAC salmon
90 million pounds	Annual average volume of PWSAC salmon common property harvest
$296 million	Cumulative common property harvest value of PWSAC salmon
$49 million	Annual average value of PWSAC salmon common property harvest
$59 million	Annual average odd-year value of PWSAC common property harvest
43%	PWSAC salmon share of total PWS commercial salmon harvest value, 2012-2017
$730 million	Cumulative first wholesale value of PWSAC-produced salmon products
$122 million	Annual average first wholesale value of PWS-produced salmon products
1,405 jobs direct, indirect, and induced	Annual average employment supported by PWSAC
$68 million including all multiplier effects	Total annual labor income supported by PWSAC
$192 million	Total annual economic output generated by PWSAC produced salmon

Introduction

This report details the broad economic impact on Alaska of Prince William Sound Aquaculture Corporation (PWSAC). This is the sixth impact report prepared by McDowell Group for PWSAC since 2001.

PWSAC was founded in 1974 by local Prince William Sound (PWS) fishermen. The private non-profit corporation's mission is to optimize salmon production in PWS for all user groups, including commercial, sport, personal use, and subsistence. PWSAC produces all five salmon species from five hatcheries, four located in PWS and one located inland on the Gulkana River. PWSAC manages and operates three facilities owned by the Alaska Department of Fish & Game at no cost to the state.

Armin F. Koernig Hatchery
Originally the site of a salmon cannery, the Armin F. Koernig Hatchery is located about 90 miles west of Cordova on Evans Island. The facility was PWSAC's first hatchery and began operations in 1974.

Wally Noerenberg Hatchery
The Wally Noerenberg Hatchery is located approximately 20 miles east of Whittier in Lake Bay. Built in 1985, the hatchery is one of the largest salmon production facilities in North America.

Cannery Creek Hatchery
The Cannery Creek Hatchery was built in 1978 by the Alaska Department of Fish and Game (ADF&G). In 1988 PWSAC took over management and operations (ADF&G still owns the hatchery.) The facility is located about 40 miles east of Whittier in Unakwik Inlet.

Main Bay Hatchery
Built in 1981 by ADF&G and still owned by the state, PWSAC began providing management and operation services in 1991. Main Bay Hatchery is located 40 miles southwest of Whittier.

Gulkana Hatchery
The Gulkana Hatchery is located on the Gulkana River near Paxson, 250 miles northeast of Anchorage. Established by ADF&G in 1973, PWSAC manages the facility which focuses primarily on sockeye salmon.

Administrative Operations
PWSAC's main administrative offices are in Cordova. The organization also operates a distribution center in Anchorage used to consolidate and expedite supplies to hatcheries. That center also houses administrative staff.

Commercial Fisheries Impact

Prince William Sound commercial seine and gillnet fishermen harvest significant volumes of salmon produced by PWSAC.

Common-property Commercial Harvest and Ex-vessel value

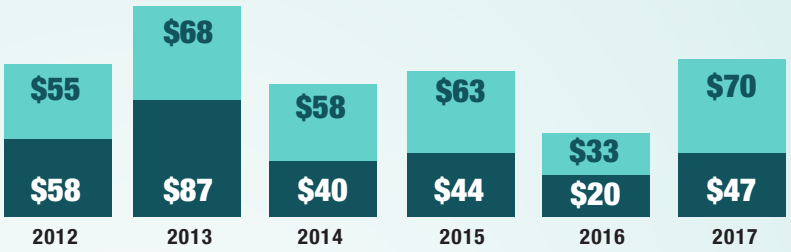
- Between 2012 and 2017, PWS commercial fishermen (all gear types) harvested a cumulative total of 539 million pounds of PWSAC-produced salmon worth $296 million. The annual commercial harvest of PWSAC fish averaged 90 million pounds worth $49 million.
- PWSAC salmon accounted for 43 percent of the total PWS salmon harvest volume over the 2012 to 2017 period (1.2 billion pounds) and 45 percent of the total value ($642 million).
- By volume and value, pink salmon is the most important species produced by PWSAC. Commercial fishermen harvested 390 million pounds (120 million pink salmon) from PWSAC between 2012 and 2017 worth about $131 million. The annual commercial harvest of PWSAC pink salmon averaged 65 million pounds worth $22 million.
- Over the 2012-2017 period, more than one in three pink salmon harvested in PWS came from PWSAC.
- Sockeye salmon are the most valuable species produced by PWSAC on a per pound basis. Over the study period, 44 million pounds were harvested worth $94 million. About 7.3 million pounds of sockeye worth $16 million were harvested annually.
- Chum are valued primarily for their roe, but flesh markets have developed in recent years. About 104 million pounds of this PWSAC-sourced chum worth $68 million were harvested between 2012 and 2017, or an annual average of 17 million pounds worth $11 million.
- PWSAC also produces coho: about 2.2 million pounds worth $2.3 million were harvested over the study period. Nearly 375,000 pounds were harvested annually worth about $390,000.

Seine Harvest of PWSAC Salmon

- Seine vessels focus primarily on pink and chum salmon fisheries in PWS. About 220 vessels with 900 crew and captains harvest PWSAC fish.
- Between 2012 and 2017, seiners harvested about 996 million pounds of salmon in PWS worth $347 million. PWSAC fish accounted for 404 million pounds or 41 percent of total volume. These hatchery fish were valued at $148 million, 43 percent of the total seine harvest.
- For the individual PWS seine permit holder, earnings over this period totaled $1.6 million, or an annual average of $265,000. Harvest of PWSAC fish contributed about $682,000 (annual average of $114,000) to this total.

Value of Prince William Sound Common-Property Salmon Harvest

by Source, 2012-2017 (millions of dollars)



Source: ADF&G, PWSAC, and McDowell Group Estimates.

Ex-vessel Earnings from PWSAC Salmon

2012-2017 (millions of dollars)

Year	Seine	Gillnet	Total
2012	$23	$35	$58
2013	$58	$29	$87
2014	$14	$25	$40
2015	$25	$19	$44
2016	$2	$18	$20
2017	$25	$22	$47
Total	**$148**	**$148**	**$296**

Source: ADF&G, PWSAC, and McDowell Group Estimates.

Gillnet (Drift and Setnet) Harvest of PWSAC Salmon

- Gillneters harvest less volume than seiners but capture higher value sockeye and coho. Nearly 520 drift vessels with about a thousand crew and captains harvest fish in PWS, in addition to roughly 30 setnet sites with 90 crew and permit holders.
- PWS gillnet fishermen harvested 220 million pounds of salmon between 2012 and 2017, an annual average of 37 million pounds. This harvest was worth $295 million, an annual avenge of $49 million per year. Of this total, salmon from PWSAC contributed 135 million pounds worth $148 million, or 61 percent of total volume and 50 percent of earnings.
- For the average permit holder, earnings over this 6-year period totaled $538,000. Harvest of PWSAC fish accounted for $270,000 of this amount, or about $45,000 annually.

Processing Impact

- Salmon from PWSAC is processed primarily in Cordova and Valdez, in addition to Seward, Kodiak, and other communities.
- The PWS seafood processing sector includes shoreside plants, floating processors, and direct marketers.
- Between 2012 and 2017, PWS processors sold $1.63 billion worth of seafood products; $1.58 billion (97 percent) came from salmon. Halibut, sablefish, Pacific cod, and other species composed the remainder.
- Between 2012 and 2017, the first wholesale value of salmon products originating from PWSAC salmon totaled more than $730 million, or an annual average of about $122 million. Pink salmon products were the largest component, contributing an annual average of more than $70 million.
- Processors added $434 million in value to PWSAC-produced salmon over the 2012-2017 period. This value-added (or gross margin) is total value ($730 million) minus the cost of purchasing the fish ($296 million).
- Most PWSAC pink salmon is processed into frozen headed and gutted (H&G) form and shipped to a reprocessing facility. A declining portion of pink salmon are canned. In 2012 about half of all Alaska pink salmon were canned; in 2017 this proportion had declined to about a quarter.
- Nearly all PWSAC chum leave Alaska as frozen H&G. The primary coho and sockeye products are also primarily frozen, but with more value-add such as fillets and vacuum sealed. These two species also serve the fresh market, especially sockeye in the early season.
- Utilization of PWS salmon has increased as markets have been developed for different grades of salmon flesh products. Increased regional capacity for fish meal and fish oil production has also increased utilization.

Sport, Personal Use, and Subsistence Impact

Sport

- PWSAC salmon are commonly harvested by charter boat operators from Seward.
- Nearly 40,000 PWSAC coho were harvested by anglers over the 2012-2017 period, equal to about 2,200 daily bag limits annually; 7,500 PWSAC sockeye were harvested as well, or more than 200 daily bag limits per year.

Personal Use and Subsistence

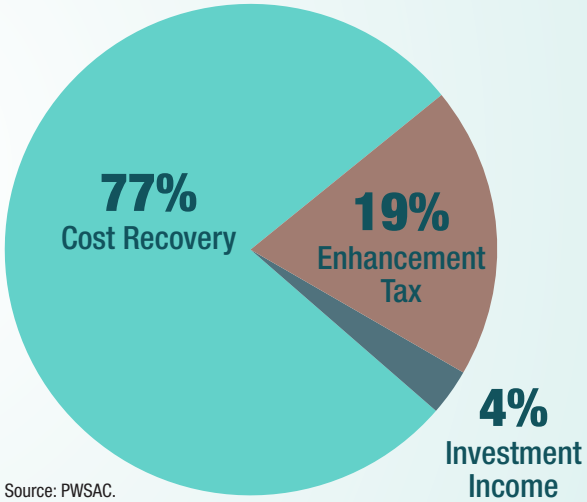
- Personal use and subsistence users harvest sockeye salmon produced by PWSAC's Gulkana hatchery in the Copper River. Between 2008 and 2017, PWSAC was the source of nearly two-in-five sockeye salmon harvested in these fisheries.
- Residents of more than 50 Alaska communities harvested more than 325,000 PWSAC-produced sockeye salmon from 2012 through 2017, including:
  - Fairbanks: **115,000 fish**
  - Anchorage: **80,000 fish**
  - Matanuska-Susitna: **60,000 fish**
  - Copper River Valley: **50,000 fish**
- Assuming the average 4-person family eats 40 salmon per year, PWSAC's annual contribution to personal use and subsistence fisheries helps feed 5,400 Alaskans annually.
- Harvest of PWSAC salmon attracts users who support hospitality, retail, and guiding businesses in the Copper River Valley.

PWSAC Operations

PWSAC is funded primarily through revenue generated from cost recovery operations when a portion of returning hatchery fish are sold directly to seafood processors. Other sources of operating revenue include a 2.0 percent enhancement tax paid by area fishermen and investment revenue. PWSAC periodically receives capital grants from the State of Alaska to support improvements at state-owned facilities.

- In 2017, operating revenue totaled $12.6 million. Cost recovery was the largest component, contributing $10.1 million or 80 percent of the total. Enhancement tax revenue of $2.0 million (16 percent) and investment income of $0.6 million (4 percent) accounted for the remainder.
- Over the 2012-2017 period, operating revenue from all sources averaged $12.0 million. Cost recovery revenue contributed an annual average of $9.3 million, or 77 percent of the total. Enhancement tax generated an average of $2.3 million (19 percent) per year and investment income totaled $0.4 million (4 percent) annually.

PWSAC Operating Revenue Sources
2012-2017 Annual Average



Source: PWSAC.

Economic Impact of PWSAC in Alaska

- PWSAC accounted for an annual average of 1,405 direct, indirect, and induced jobs over the 2012-2017 period. Total annual labor income averaged $68 million over this time, including all multiplier effects.
- PWSAC's employment impacts include 610 annual-equivalent jobs connected with commercial fishing, 645 jobs associated salmon processing, and 150 jobs related to hatchery administration and operations.
- PWSAC's impacts include $39 million in labor income connected with commercial fishing, $24 million associated salmon processing, and $6 million related to hatchery administration and operations.
- Total economic output associated with PWSAC, including all direct, indirect, and induced spending and wages, is estimated at $192 million annually.
- The total number of people earning income as a result of PWSAC operations and production is more than double the annual average of 1,405, including fishermen, seasonal processing workers, seasonal and year-round hatchery employees, and support sector workers.

Annual Average Economic Impact of PWSAC
2012-2017

	Direct Impacts	Indirect & Induced Impacts	Total Economic Impacts
Commercial Fishing			
Employment	420	190	610
Labor Income	$29.4 million	$9.2 million	$38.6 million
Seafood Processing			
Employment	425	220	645
Labor Income	$16.8 million	$7.0 million	$23.8 million
PWSAC Operations			
Employment	85	65	150
Labor Income	$3.5 million	$2.2 million	$5.7 million
Total Economic Impact			
Employment	930	475	1,405
Labor Income	$49.6 million	$18.4 million	$68.0 million
Output	$123.2 million	$69.0 million	$192.2 million

Note: Totals may not sum due to rounding.
Source: McDowell Group estimates using IMPLAN, ADF&G, DOLWD, and PWSAC data.

Distribution of Economic Impacts

The economic impact of PWSAC extends well beyond Prince William Sound. PWS seine and gillnet permit holders come from many Alaska communities:

- In 2017, PWS seine permit holders were from 22 Alaska communities; residents of 30 Alaska communities held PWS gillnet permits.
- In 2017, Anchorage and Matanuska Borough residents held 115 limited entry permits for PWS.
- After Cordova, Homer residents generate the most commercial fishing income (more than $21.6 million in 2017) from PWS salmon fisheries. Resident of Kenai Peninsula Borough earned a total of $31.9 million.
- Municipality of Anchorage residents rank third in terms of PWS commercial fishing income, with $13.7 million in earnings in 2017, while Mat-Su Borough residents earned more than $3.5 million.

With PWSAC accounting for 45 percent of the value of PWS salmon fisheries over the 2012-2017 period (including 40 percent in 2017), it is evident that income generated by harvest of PWSAC salmon is broadly distributed.

PWSAC's economic impact outside of PWS also stems from its purchases of supplies, professional services, freight services, and many other goods and services from vendors throughout Southcentral Alaska.

In 2017, PWSAC spent $4.0 million on with 158 different vendors in 23 Alaska communities, including $1.5 million in Anchorage with 102 different vendors. Other spending occurred in Whittier, Seward, Fairbanks, Palmer, Eagle River, and Kenai, among others.

PWSAC has more direct economic impact in the Anchorage/Mat-Su area as well, employing 16 individuals from the region with annual wages of nearly $600,000. PWSAC maintains an office in Anchorage, with 7 employees.

Local processors handling PWSAC salmon supported further economic impacts in Southcentral Alaska outside PWS through purchases of supplies, utilities, and other services.

Residency of PWS Salmon Permit Holders

with Ex-vessel Earnings, 2017

Location	Permits Owned	Ex-vessel Earnings
Valdez/Cordova Census Area	**325**	**$36,865,213**
Cordova	301	$33,093,490
Valdez	21	n/a
Chitina	1	n/a
Copper Center	1	n/a
Whittier	1	n/a
Kenai Peninsula Borough	**155**	**$31,853,416**
Homer	97	$21,627,598
Seward	22	$4,238,507
Soldotna	6	$282,171
Kasilof	7	$269,402
Kenai	7	n/a
Anchor Point	5	n/a
Sterling	5	n/a
Moose Pass	3	n/a
Ninilchik	1	n/a
Nikolaevsk	1	n/a
Seldovia	1	n/a
Municipality of Anchorage	**81**	**$13,735,376**
Anchorage	48	$4,352,712
Girdwood	22	$6,224,356
Eagle River	8	n/a
Chugiak	3	n/a
Mat-Su Borough	**34**	**$3,546,537**
Wasilla	26	$2,117,088
Palmer	3	n/a
Willow	3	n/a
Sutton	2	n/a
All Other Alaska	**27**	**$2,606,806***
Juneau	6	n/a
Kodiak	5	$1,964,499
Delta Junction	5	$642,307
Fairbanks	3	n/a
Petersburg	3	n/a
Dillingham	2	n/a
Dutch Harbor	1	n/a
Haines	1	n/a
Hoonah	1	n/a
Alaska Resident Total	**622**	**$90,580,317**

*Subtotal does not include confidential values.
Note: n/a means values are confidential. **Alaska Resident Total** includes confidential data.
Source: CFEC

Tax Revenue Associated With PWSAC

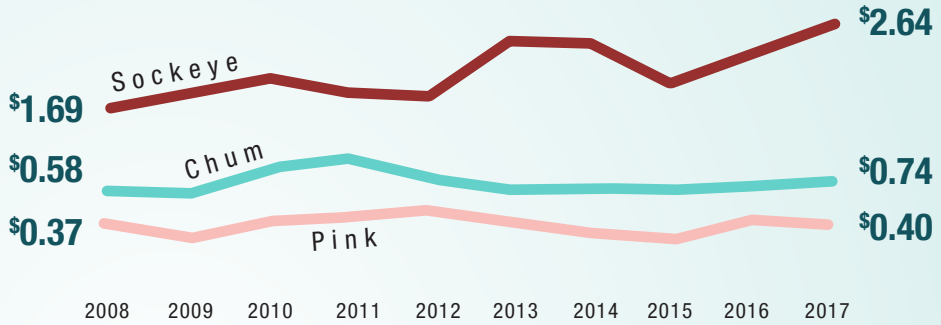
PWSAC salmon production generates significant state and local taxes

- Between 2012 and 2017, harvest of PWSAC salmon generated about $10.6 million through the State of Alaska's Fisheries Business Tax. Half of this total is shared with communities where PWSAC salmon are landed ($5.3 million) and the State retains the remainder. Cordova and Valdez receive most of these funds.
- Other tax revenue is directly generated when PWSAC-sourced fish are landed in a community with a raw fish tax (e.g., Kodiak). Communities with sales tax (e.g., Cordova and Seward) are also supported indirectly when the harvest and processing sector purchase goods and services locally.
- Property tax revenue is also generated indirectly through processing of salmon. Silver Bay Seafoods and Peter Pan Seafood are among the largest non-oil property tax payers in Valdez. Trident Seafoods, Ocean Beauty Seafoods, and Copper River Seafoods paid nearly $250,000 in 2018 property taxes to the City of Cordova.

Market Outlook for Wild Alaska Salmon

- The near-term market outlook for wild Alaska salmon is positive. Strong consumer demand for Alaska-caught fish combined with processor innovations and a focus on quality have strengthened Alaska's place in the competitive global market.
- Over the last decade ex-vessel prices have generally been stable or trended higher. Nominal ex-vessel pink salmon prices averaged $0.39 per pound in PWS, ranging from a high of $0.53 in 2012 to a low of $0.23 in 2015. Relatively weak statewide harvest levels for pink salmon in 2018 will help support demand and a stable or elevated price.
- Chum salmon prices averaged $0.67 per pound over the same period, including a high of $0.87 in 2011. Average PWS sockeye prices per pound have grown, reaching $2.64 in 2017.
- Near-term threats to the Alaska salmon industry include currency fluctuations, trade disruptions, and run failures. Competition with farmed salmon remains a long-term challenge.

Average Nominal Prince William Sound Ex-vessel Salmon Prices (per pound), 2008-2017



Source: ADF&G

Methodology and Sources

All photos are from ASMI, Franklyn Dunbar, and McDowell Group.

The data used in this report comes from a variety of sources, including PWSAC, Alaska Commercial Fisheries Entry Commission (CFEC), Alaska Department of Fish and Game (ADF&G), Alaska Department of Labor and Workforce Development (DOLWD), and Alaska Department of Revenue (DOR). In addition, interviews were conducted with PWSAC staff, ADF&G employees, and other experts. Estimates provided in this report are based on the best available data. The study team used data from these sources, in addition to proprietary research, to develop economic models to estimate direct, indirect, and induced employment and labor income.

ASHBURN & MASON P.C.

LAWYERS

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July 9, 2018

VIA EMAIL: dfg.bof.comments@alaska.gov

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

Re: **Public Comments of Ashburn & Mason, P.C., Counsel for Prince William Sound Aquaculture Corporation In Opposition To May 16, 2018 KRSA et al. Emergency Petition Regarding VDFA Hathcery Production (Comment Due Date July 9, 2018).**

Dear Chairman Jensen and Members of the Board of Fisheries,

Ashburn & Mason, P.C., counsel to Prince William Sound Aquaculture Corporation ("PWSAC"), submits the following opposition and public comments to the above-referenced petition:

INTRODUCTION

Petitioners ask the Board to declare an emergency and reduce the current permitted salmon production at Valdez Fisheries Development Association's ("VFDA") Salmon Gulch Hatchery. The Department of Fish and Game (the "Department") granted VFDA's production permit in 2014, which provided for gradual production increases on a yearly basis. In year three of the permit, Petitioners now ask the Board to declare an

ASHBURN & MASON P.C.

"emergency" and essentially veto this permit without engaging in the notice and comment rulemaking required by statute. The Petition establishes no "emergency," nor does the Board of Fisheries ("Board") have the statutory authority to veto the Department's prior permit decision regarding salmon production.

A permit granted four years ago does not qualify as an "emergency" under any definition of the word, let alone the strict definition governing emergency petitions under Alaska law. By statute, true regulatory emergencies are held to a minimum and rarely found.[1] The reason for this strict standard is that enacting regulations outside of the notice and comment rulemaking procedures mandated by the Administrative Procedure Act is strongly disfavored. Here, establishing an emergency requires "unforeseen" and "unexpected" threats against fish and game resources.[2] VFDA's long-standing permit is neither unforeseen nor unexpected. The fact that Petitioners chose not to engage in the public process leading to the permit grant does not make the permit "unforeseen."

Even if there were an emergency, the Board lacks statutory authority to grant the relief requested by Petitioners. As set forth in detail below, the legislature invested the Department with the legal duty to oversee all aspects of hatchery creation, operation, and

[1] AS 44.62.270.

[2] 5 AAC 96.625(f).

production,[3] including but not limited to how many fish hatchery operators are allowed to incubate and release each year. By statute, the Department, not the Board, regulates hatchery activities that directly impact production levels, such as the harvest of eggs from hatchery broodstock.[4] The Board, on the other hand, is tasked with regulating and allocating the harvest of both hatchery and wild salmon among all user groups that the hatcheries were established to serve, including commercial, personal use, sport, subsistence, and hatchery cost recovery.[5] The Department and the Board have respected and abided by this division of labor and authority for over 30 years. To our knowledge, the Board has never before attempted to second guess a decision by the Department to authorize a specific level of egg take in a hatchery permit.

The Petition seeks to disrupt this well-established division of authority by interjecting the Board into the realm of production management. Specifically, the Petition asks the Board to micro-manage egg take levels from hatchery broodstock, which is squarely within the Department's sphere of authority and expertise, and outside the Board's jurisdiction over allocation of harvest levels. The Petition's only ground for this change in the *status quo* is a narrow statutory subsection, AS 16.10.440(b), addressing

[3] AS 16.10.400-.470; 5 ACC 40.005-.990.
[4] AS 16.10.445; 5 AAC 40.300; 5 AAC 40.340; 5ACC 40.840.
[5] *E.g.*, AS 16.05.251.

the Board's authority to amend hatchery permits regarding the "source and number of salmon eggs." This provision cannot bear the weight Petitioners place on it.

When this statute was enacted in 1979, the legislative's reference to "the source and number of salmon eggs" almost certainly referred to the collection of *wild* salmon eggs, before the hatcheries' cost recovery operations had been fully established. Back in 1979, collection of salmon eggs from wild stocks involved the harvest of wild salmon still swimming out in the ocean. In those early days, egg take had a potential to affect the Board's allocative decisions. By contrast, hatchery egg take today is conducted entirely from returning hatchery broodstock, captured in terminal harvest areas, not out in the Sound, with little or no allocative implications.

Even if the statute could be construed to apply to eggs recovered from returning hatchery broodstock, it is an insufficient legal basis for disrupting the Department's comprehensive regulatory regime, which includes hatchery production planning and detailed permitting requirements. Again, the Board has jurisdiction over harvest levels, and the Department has jurisdiction over all aspects of hatchery production, including egg take levels.[6]

[6] *E.g.*, AS 16.10.445, granting the Department exclusive authority over "the source and number of salmon eggs taken" by hatchery operators.

The Petition is also premature. The potential effects of hatchery fish straying into wild salmon streams, which is the stated impetus for the Petition, have been closely watched by the Department's biologists over the years. These effects are now the subject of an ongoing, in-depth scientific study. Until the study results are known, it is premature to consider curtailment of hatchery production that has already been permitted by the Department. Further, the Board has already stated its intent to address hatchery issues during its regular fall meeting cycle. These important issues can be addressed at that time where there is full opportunity for public participation and comment.

ABOUT ASHBURN & MASON AND PWSAC

Ashburn and Mason is submitting these comments, which focus on the relevant statutes, regulations, and established administrative practice, as a supplement to the comments submitted directly by the Prince William Sound Aquaculture Corporation ("PWSAC"). Ashburn & Mason has represented PWSAC since its creation in 1974. Our firm worked closely with PWSAC's visionary founders in the legislative process that resulted in the creation of the private nonprofit hatcheries ("PNPs") regional aquaculture associations, now codified at AS 16.10.375, *et. seq.*

PWSAC's founders were commercial fishers and community leaders who were responding to repeated wild salmon run failures, and the resulting economic distress

throughout the Prince William Sound region in the early 1970s. Working together, the fishermen, local community representatives, the Department, and key legislators developed an innovative legal framework for the creation and operation of the state's PNPs and regional aquaculture associations.

Over the past 40-plus years, the statewide hatchery system has been a resounding success, and is an integral part of Alaska's world class sustainable fisheries. Alaska's hatcheries have generated tens of millions of dollars of economic benefit every year spread across all user groups, supplementing, but not displacing, the sustained yield of Alaska's wild salmon stocks. In fact, all of PWSACs hatcheries were started with salmon eggs collected originally from local wild stocks. The genetics of all Prince William Sound hatchery fish are therefore traceable back to local streams.

DISCUSSION

I. NO EMERGENCY EXISTS TO JUSTIFY THE PETITION TO RESTRICT VFDA'S PERMITTED EGG TAKE

By statute, true regulatory emergencies, which allow the Board to issue regulation without public notice and comment, are held to a minimum and rarely found.[7] This is because public notice and comment are essential to the fairness and transparency of

[7] AS 44.62.270.

regulatory rulemaking in Alaska. The explicit state policy against the adoption of emergency regulations is so fundamental to the function of regulatory rule-making that it is codified in the Administrative Procedure Act.[8] The Commissioner's decision to deny the emergency Petition reflects this well-established policy and decades of Alaska law and regulation, and must be respected.

The Petition does not present an emergency. Rather, it challenges a permit granted several years ago. The narrow exception for adoption of emergency regulations is limited to "unforeseen" and "unexpected" threats against fish and game resources.[9] These threats must be so imminent that regulatory intervention cannot wait for the usual notice and comment process under the Administrative Procedure Act.[10] For example, the Board adopted an emergency regulation to reorganize the Chignik fishery in 2005 when the Supreme Court issued a decision invalidating the previous fishery rules just six weeks before the season was slated to open.[11] The Superior Court agreed that the timing of the Supreme Court's decision created a legitimate emergency because no one could

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[8] *Id.*

[9] 5 AAC 96.625(f).

[10] 5 AAC 96.625(f).

[11] As referenced *infra.* at 3-4, the Commissioner currently has standing authority to review petitions for emergency regulation. See, 2015-277-FB. Prior to the adoption of this policy in 2015, the Board retained the authority to review petitions for emergency regulation.

reasonably rely on when the Supreme Court would issue its decision, or what that decision would be. In addition to the "unexpected" and "unforeseen" nature of the Supreme Court's decision, the timing also created a sense of imminence. With less than six weeks before the fishing season opened, the Board "had to act quickly...because it had to have something in place for the June opening."[12]

Here, the Petition fails to demonstrate how VFDA's long-standing permit, or the current conditions in the Sound, present an unexpected or unforeseen situation threatening the salmon fisheries. No acute biological or environmental event has impacted the Sound or Cook Inlet in recent months, creating an unpredictable threat. Rather, the purported justification for an emergency petition is an alleged trend, observed over the last several *years*. There is no reason why the proposed Board action could not have been presented a year ago or, more to the point, why it could not wait until the next regularly scheduled Board meeting, which will provide a fuller and fairer opportunity for interested parties and members of the public to comment and participate in the process.

In short, the Commissioner properly exercised his authority under AS 16.05.270 and 2015-277-FB to determine that the Petition failed to present an emergency under the

[12] See, *State of Alaska, Alaska Bd. of Fisheries v. Grunert,* 139 P.3d 1226, 1241 (Alaska 2006).

Administrative Procedure Act. For the reasons explained in the Commissioner's June 14, 2018 letter to Petitioners, emergency action is unwarranted under these circumstances.

II. THE BOARD DOES NOT HAVE VETO AUTHORITY OVER HATCHERY PRODUCTION PERMITS

A. The Commissioner Has Primary Authority Over Hatchery Permitting and All Hatchery Operations

1. History and Purpose of the Hatchery Program

The desire of Alaskans to manage their abundant salmon fisheries was a driving force behind Alaska Statehood.[13] The importance of protecting and developing natural resources such as salmon is embedded in the Alaska Constitution, which directs the legislature to "provide for the utilization, development, and conservation of all natural

[13] *See, e.g., Pullen v. Ulmer*, 923 P.2d 54, 57 n. 5 (Alaska 1996); Alaska Legislative Affairs Agency, *Alaska's Constitution: A Citizen's Guide* (4th ed. 2002) at http://w3.legis.state.ak.us/docs/pdf/citizens_guide.pdf (Many Alaskans concluded "that the notion of the federal government's superior vigilance as a trustee of the public interest was really a cloak for the institutional interests of bureaucrats and the economic interests of nonresident corporations exploiting those resources (principally Seattle and San Francisco salmon canning companies)."); HOUSE COMM. ON INTERIOR AND INSULAR AFFAIRS, *Act Providing for the Admission of the State of Alaska into the Union of 1957*, H.R. REP. No 85-624 (1958) (The Statehood Act "will enable Alaska to achieve full equality with existing States, not only in a technical juridical sense, but in practical economic terms as well. It does this by making the new State master in fact of most of the natural resources within its boundaries . . . ."); Univ. of Alaska Anchorage, Institute for Social and Economic Research, *Salmon Fish Traps in Alaska* (1999), at 14, at http://www.iser.uaa.alaska.edu/publications/fishrep/fishtrap.pdf ("Alaska political entrepreneurs used the [fish] trap issue to rally the citizens of the territory around the quest for statehood.").

resources belonging to the State, including land and waters." It also requires the legislature to make decisions that "provide for the maximum benefit of its people."[14] The Alaska Constitution proclaims that "fish, wildlife, and waters are reserved to the people for common use,"[15] and dictates that "Fish, forests, wildlife, grasslands, and all other replenishable resources belonging to the State shall be utilized, developed, and maintained on the sustained yield principle, subject to preferences among beneficial uses."[16] Further, the Constitution expressly references the goal of "promot[ing] the efficient development of aquaculture in the State," and protecting Alaska's economy from outside interests:[17]

> No exclusive right or special privilege of fishery shall be created or authorized in the natural waters of the State. This section does not restrict the power of the State to limit entry into any fishery for purposes of resource conservation, to prevent economic distress among fishermen and those dependent upon them for a livelihood ***and to promote the efficient development of aquaculture in the State.***

By the early 1970s, salmon runs were in steep decline throughout Alaska. In Prince William Sound, seining did not open at all in 1972 and 1974 due to dangerously

[14] ALASKA CONST. art. VIII, § 2.

[15] ALASKA CONST. art. VIII, § 3.

[16] ALASKA CONST. art. VIII, § 4.

[17] ALASKA CONST. art. VIII, § 15. The Constitution has since been amended to provide for the limited entry permit system now in place, *See infra* n. 7, but the reference to promoting the "efficient development of aquaculture" remains unchanged.

low wild stock returns. In response, the State of Alaska resolved to restore the salmon fisheries. A constitutional amendment provided the basis for limited entry legislation for commercial fisheries,[18] and the state hatchery program was initiated through the creation of the Fisheries Rehabilitation & Enhancement Division (FRED).[19]

Under AS 16.05.020, the Commissioner must "manage, protect, maintain, *improve, and extend* the fish, game ... of the state in the interest of the economy and general well-being of the State." The Department is further required to: "develop and continually maintain a comprehensive, coordinated state plan for the orderly present and long-range rehabilitation, *enhancement*, and development of all aspects of the state's fisheries for the perpetual use, benefit, and enjoyment of all citizens" and "through rehabilitation, *enhancement*, and development programs do all things necessary to ensure perpetual *and*

[18] AS 16.43.400 *et seq.* Alaska's limited entry fishery essentially provides that only permit holders may engage in commercial fishing. The granting of these permits, and the management of the commercial fisheries, are tightly regulated by numerous state agencies including the State Commercial Fisheries Entry Commission (CFEC), the Alaska Department of Fish & Game (ADF&G), and the Board of Fisheries (BOF). *See generally Johns v. CFEC*, 758 P.2d 1256, 1263 (Alaska 1988) ("The Limited Entry Act has two purposes: enabling fishermen to receive adequate remuneration and conserving the fishery.").

[19] AS 16.05.092. As explained more fully below, FRED no longer exists as a distinct division within the Department. However, the operation of most or all of the original hatcheries owned and operated by FRED has been transferred to the regional aquaculture associations, under long-term professional services agreements. PWSAC, for example, currently operates the Cannery Creek, Main Bay, and Gulkana Hatcheries, all of which were constructed and initially operated as FRED hatcheries in the early 1970s.

increasing production and use of the food resources of state waters and continental shelf areas."[20] Similarly, the Department is required generally to "manage, protect, maintain, *improve, and extend* the fish, game and aquatic plant resources of the state in the interest of the economy and the general well-being of the state."[21] The Department is also generally charged to do everything possible to assist with hatchery operations.[22]

In addition, the legislature created the Fisheries Enhancement Revolving Loan Fund to promote the enhancement of Alaska's fisheries by, among other things, providing long-term, low-interest loans for hatchery planning, construction, and operation.[23] PWSAC has received significant support from this program over the years, particularly for capital investments.

In 1974, the FRED state-owned and managed hatchery program was expanded to include private ownership of salmon hatcheries with the passage of the Private Non-Profit (PNP) Hatchery Act.[24] The Act stated that its purpose was to "authorize the private ownership of salmon hatcheries by qualified non-profit corporations for the purposes of

[20] AS 16.05.092(3) (emphasis added).

[21] AS 16.05.020(2) (emphasis added).

[22] AS 16.10.443.

[23] AS 16.10.500-.560; *see generally* Alaska Division of Investments, "Fisheries Enhancement Revolving Loan Fund Program Overview," April 2007 at http://www.commerce.state.ak.us/investments/pdf/FEover07.pdf.

[24] These provisions are now codified at AS 16.10.375 *et seq.*

contributing, by artificial means, to the rehabilitation of the State's depleted and depressed salmon fishery." Further, as noted above, a separate fisheries enhancement loan program was created in 1976 to provide state financing for nonprofit hatcheries.[25]

Over time, the State has transferred operation of some of the FRED hatcheries to other entities, including the nonprofit hatcheries operated by the regional aquaculture associations, concluding that it would be more cost-effective for these hatcheries to be operated by the regional associations. The legislature specifically authorized the sub-contracting of state hatcheries in 1988,[26] acknowledging that after 17 years of the State planning, building and operating hatcheries, Alaska sought an even more efficient way of ensuring a healthy, robust, and sustainable salmon fishery.[27]

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[25] AS 16.10.500 *et seq.; see also State Commercial Fisheries Entry Comm'n v. Carlson*, 65 P.3d 851 (Alaska 2003) ("The state operates a revolving loan fund to support investments in developing and operating fish hatcheries and other fish enhancement projects.").

[26] AS 16.10.480.

[27] Alaska's partnership with the nonprofit hatcheries is unique. Almost all states operate hatcheries of some kind (salmon, trout, walleye, catfish, etc.), but no state operates a hatchery program like Alaska's, and no state works with private nonprofit entities to assist the state government in its hatchery programs. By way of example, California has 21 state hatcheries (http://www.dfg.ca.gov/fish/Hatcheries/HatList.asp), Oregon has 33 state hatcheries (http://www.dfw.state.or.us/fish/hatchery/), and Washington has 91 state hatcheries (http://wdfw.wa.gov/hat/facility.htm), and all of these hatcheries are operated by the government.

Alaska law provides that the hatcheries may only be non-profit.[28] By design, the hatcheries are allowed to recover operating and capital expenses, as well as costs for research and development and expansion of the production system, including wild stock rehabilitation work.[29] The system is designed to provide benefits to the common property resource users. The nonprofit regional aquaculture associations have no stock-holders, owners, or members. Today, five regional aquaculture associations, from Southeast Alaska to Kodiak, including PWSAC, produce hatchery salmon for common property fisheries.

Thus, the Alaska Constitution, combined with numerous statutes, including those creating the Department of Fish and Game,[30] the Limited Entry Act,[31] the Private Non-Profit Hatcheries Act,[32] and the Fisheries Enhancement Revolving Loan Fund,[33] together

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[28] AS 16.10.380.

[29] AS 16.10.455.

[30] AS 16.05.010, *et.seq.*; *see also* 5 AAC 40.100-.990.

[31] AS 16.43.400 *et seq.* Alaska's limited entry fishery essentially provides that only permit holders may engage in commercial fishing. The granting of these permits, and the management of the commercial fisheries, are tightly regulated by numerous state agencies including the State Commercial Fisheries Entry Commission, the Alaska Department of Fish & Game (ADF&G), and the Board of Fisheries (BOF). *See generally Johns v. CFEC*, 758 P.2d 1256, 1263 (Alaska 1988) ("The Limited Entry Act has two purposes: enabling fishermen to receive adequate remuneration and conserving the fishery.").

[32] AS 16.10.375-480.

[33] AS 16.10.500-.560.

demonstrate a strong and long-standing state policy in Alaska of promoting hatchery development for the purpose of enhancing and ensuring the long-term vitality of Alaska's fisheries.

2. The Department Strictly Regulates All Aspects of Hatchery Creation, Operation, and Production

The Alaska Department of Fish and Game has been charged by the Alaska legislature with final authority over how many fish hatchery operations are allowed to incubate and release each year,[34] and to regulate all other details of hatchery operation.[35]

Pursuant to AS 16.10.375, the Commissioner must designate regions of the state for salmon production and develop a comprehensive salmon plan for each region through teams consisting of Department personnel and nonprofit regional associations of user groups. The Commissioner also has the task of classifying an anadromous fish stream as suitable for enhancement purposes before issuing a permit for a hatchery on that stream. As 16.10.400(f).

Of particular relevance to the issue presently before the Board, AS 16.10.400(g) requires a determination by the Commissioner that a hatchery would result in substantial public benefits and would not jeopardize natural stocks. The statutes also require the

[34] AS 16.10.445; 5 AAC 40.300; 5 AAC 40.340; 5 AAC 40.840.
[35] AS 16.10.400-.470; 5 AAC 40.005-.990.

Department to conduct public hearings near the proposed hatcheries, and to consider comments offered by the public at the hearings before issuance of a permit.[36]

All state hatcheries are operated pursuant to a permit issued by the Department.[37] Standard permit conditions include: (1) provisions that eggs used for broodstock come from a source approved by the Department;[38] (2) no placement of salmon eggs or resulting fry into waters of the state except as designated in the permit; (3) restrictions on the sale of eggs or resulting fry; (4) no release of salmon before department inspection and approval; (5) destruction of diseased salmon; (6) departmental control over where salmon are harvested by hatchery operators; and (7) hatchery location to prevent commingling with wild stocks. [39]

Further, there is an intricate system of basic and annual hatchery plans that are reviewed annually by the Department and provide for performance reviews, and in

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[36] AS 16.10.410.

[37] AS 16.10.400; 16.40.100-.199; 5 AAC 40.110-.240.

[38] AS 16.10.445. This requirement is related to regulations regarding fish transport permitting. *See* 5 AAC 41.001-.100. These regulations provide that no person may transport, possess, export from the state, or release not the waters of the state any live fish unless that person holds a fish transport permit issued by the Commissioner.

[39] *See generally* McGee, *Salmon Hatcheries in Alaska – Plans, Permits, and Policies Designed to Provide Protection for Wild Stocks,* Published for 2004 American Fisheries Society Symposium, at 327.

appropriate cases, permit alterations.[40] The basic management plans include a complete description of the facility, including the special harvest area, broodstock development schedules, and description of broodstock and hatchery stock management.[41]

Year-to-year hatchery production is regulated through the annual management plans (AMPs) approved and adopted by the Department. For example, each year, PWSAC and the other PNPs across the state work with the Department, which ultimately formulates an AMP for each hatchery. That plan, among other things, determines the number of eggs the hatchery will collect, how the eggs will be collected, the number of fish it will incubate, and how many fish will be released from the hatchery. [42] The AMP also addresses how PNPs will conduct their cost recovery harvest at each hatchery and addresses other specifics of hatchery operation.[43]

3. The Board's Proper Role is to Allocate Harvest, Not to Override the Department's Permitting and Production Decisions

[40] 5 AAC 40.800-990. As noted above, there is also an extensive Regional Comprehensive Planning Program established under AS 16.10.375 and 5 AAC 40.300-.370, with full public participation. This process creates Regional Planning Teams who are charged to "prepare a regional comprehensive salmon plan . . . to rehabilitate natural stocks and supplement natural production . . . ." 5 AAC 40.340.

[41] *See generally* McGee, at 329.

[42] 5 AAC 40.840.

[43] McGee, at 329.

The Board of Fisheries is established by AS 16.05.221, "for purposes of the conservation and development of the fishery resources of the state."[44] In general terms, the Board's duties complement those performed by the Department. While it has broad statutory authority, the Board has historically focused on allocation of fisheries resources between and among the various user groups and gear types. For example, under AS 16.05.251(a) the Board has the power to set time, area, and methods and means limitations on the taking of fish. Under AS 16.05.251(a)(3), the Board also establishes quotas, bag limits, and harvest levels. To the best of our knowledge, however, the Board has always deferred to the Department's expertise and experience with respect to the detailed management of hatchery permitting and production levels.

B. The Board Cannot Override Annual Hatchery Production Permits Issued by the Department

Petitioners contend that AS 16.10.440(b) grants the Board the authority to upend the Department's carefully constructed regulatory framework governing hatchery

[44] AS 16.05.221.

production.[45] This interpretation of the statute reads it out of context and is inconsistent with its historical origins. Under Alaska law, this statutory provision must be construed in light of the overall statutory scheme governing Alaska's salmon hatcheries,[46] its legislative history and intent,[47] and over 40 years of consistent administrative interpretation and practice, during which the Board (to our knowledge) has never

[45] AS 16.10.440 provides: (a) Fish released into the natural waters of the state by a hatchery operated under AS 16.10.400 - 16.10.470 are available to the people for common use and are subject to regulation under applicable law in the same way as fish occurring in their natural state until they return to the specific location designated by the department for harvest by the hatchery operator. (b) The Board of Fisheries may, after the issuance of a permit by the commissioner, amend by regulation adopted in accordance with AS 44.62 (Administrative Procedure Act), the terms of the permit relating to the source and number of salmon eggs, the harvest of fish by hatchery operators, and the specific locations designated by the department for harvest. The Board of Fisheries may not adopt any regulations or take any action regarding the issuance or denial of any permits required in AS 16.10.400 - 16.10.470.

[46] *See, e.g. Monzulla v. Voorhees* Concrete Cutting, 254 P.3d 341, 345 (Alaska 2011), *citing In re Hutchinson's Estate*, 577 P.2d 1074, 1075 (Alaska 1978), where the Supreme Court articulated the doctrine of *in pari materia*: the "established principle of statutory construction that all sections of an act are to be construed together so that all have meaning and no section conflicts with another."

[47] *See, e.g. Native Village of Elim v. State* 990 P.2d 1, 5 (Alaska 1999), *Kochutin v. State,* 739 P.2d 170, 171 (Alaska 1987) *citing Hammond v. Hoffbeck*, 627 P.2d 1052, 1056 & n. 7 (Alaska 1981).

attempted to use this statute as the basis for usurping the Department's traditional control over hatchery production.[48]

At the time Section 440(b) was enacted in 1979, the hatchery system was in its infancy. Most hatchery egg take was from wild stocks, not returning hatchery fish, which is how egg take is conducted today. The thinking at the time was that salmon eggs harvested from wild stocks were still a "public resource" while the fish were swimming out in the ocean, and the harvest of wild fish for egg take had allocation implications that could potentially fall within the Board's purview. In contrast, today's egg take procedures are conducted almost exclusively from returning hatchery broodstock that are captured in the special harvest areas directly in front of the hatcheries. At that point, the hatchery salmon cease to be a public resource and their capture and the collection of their eggs have very limited allocative implications. Further, as the Commissioner noted in his January 14, 2018 Memorandum to the Board on the subject of the current Petition, "the

[48] *See e.g. Marathon Oil Co. v. State, Dep't of Nat. Res.*, 254 P.3d 1078, 1082 (Alaska 2011), *Premera Blue Cross v. State, Dep't of Commerce, Cmty. & Econ. Dev., Div. of Ins.*, 171 P.3d 1110, 1119 (Alaska 2007), and *Bullock v. State, Dep't of Cmty. & Reg'l Affairs*, 19 P.3d 1209, 1219 (Alaska 2001), where the Alaska Supreme Court held that agency decisions based on "longstanding, consistent and widely known" interpretations of agency expertise should be given "great weight."

Board's authority over the possession, transport and release of live fish had not been delegated to the department when AS 16.10.440(b) was amended."[49]

Moreover, the legislative history of Section 440(b) indicates that it was never intended to be used by the Board as back door means of overriding the Department's permitting authority or limiting hatchery production. The Resources Committee's letter of intent on HB 359, which included the language in question, states as follows:

> There are three other major changes made by the bill:
>
> (1) Section 2 of the bill amends AS 16.10.440(a)(b). The amendment clarifies the role of the Board of Fisheries. The role of the Board of Fisheries as envisioned by the original legislation was to regulate the *harvest* of salmon returning to the waters of the state. That role extends to regulating those fish which are returning as a result of releases from natural systems and also from hatchery releases. There are provisions in other specific locations for the harvest of salmon by the hatchery operator for sale, and use of the money from that sale, for the specific purposes as stated in AS 16.10.450. The added language clarifies that the Board of Fisheries may adopt regulations relating to the *harvest* of the fish by hatchery operators at the specifically designated locations. The Board of Fisheries in the past year or two has enacted regulations relating to those harvests for several of the private nonprofit hatcheries in the state.[50]

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[49] Memorandum from Sam Cotton, Commissioner, to John Jensen, Chair, dated January 14, 2018, Re: Emergency Petition to the Alaska Board of Fisheries requesting the Board to reverse a department decision to allow a 20 million increase in the number of pink salmon eggs to be harvested by VFDA in 2018.

[50] House Journal, March 15, 1979, pp. 601-602 (emphasis added).

The exclusive reference to regulation of harvest, and the absence of any mention of production controls, corroborates the conclusion that the legislature never intended to authorize the Board to limit hatchery production.

The Board's traditional function has always been to allocate harvests among competing user groups, not to regulate production of fish. This legislative history, with its emphasis on "harvest," is also consistent with PWSAC's long-held belief (apparently shared by the Department) that Section 440(b) was intended to cover egg take from wild salmon streams, not to apply to egg take from returning hatchery fish.

Further corroboration of this conclusion is found in AS 16.10.445(a), which unambiguously requires the Department, not the Board, to "approve the source and number of salmon eggs taken under AS 16.10.400-16.10.470." Additional evidence that the Department, not the Board, is responsible for regulating hatchery egg take can be found in 5 AAC 41.001, *et. seq.* For example, 5ACC 41.005 prohibits the release of hatchery fish without a permit issued by the Commissioner. Regulation of egg take and release of the resulting salmon fry are obviously two sides of the same coin. The regulatory scheme clearly and consistently assigns exclusive responsibility for regulating those two closely related hatchery activities to the Commissioner.

ASHBURN & MASON P.C.

Given the legislative history, the 30-plus year pattern of administrative interpretation, the anomalous language in Section 440(b) regarding regulations to "amend...the terms of a permit," and the mandate of Section 445(b), it is quite clear that the Board has little or no role in regulating hatchery production, including but not limited to egg take permit restrictions.

Moreover, regulation of hatchery production by the Board would overlap and almost certainly conflict with the comprehensive and detailed hatchery regulations that are currently in place and operating effectively. As noted above, the Department has a rigorous permitting process for new hatcheries, 5 AAC 40.100-.240. There is an extensive Regional Comprehensive Planning program established under AS 16.10.375 and 5 AAC 40.300-.370, with full public participation. By regulation, the responsibility of the Regional Planning Teams is to "prepare a regional comprehensive salmon plan ... to rehabilitate natural stocks and *supplement* natural production . . ." 5 AAC 40.340 (emphasis added). As mentioned earlier, there is also an intricate system of basic and annual hatchery plans that are reviewed annually by the Department, performance reviews, and, in appropriate cases, permit alterations. 5 AAC 40.800-.900. Production levels are carefully monitored by the Department under these regulations and adjusted if necessary for economic or biological reasons. The Department's statutory authority for

this intense level of hatchery regulation is quite clear, and there seems to be little room for the Board to insert itself into a very public process that has been working well for many years.

CONCLUSION

Back in the early 1970s, Prince William Sound experienced recurring wild salmon run failures, which caused serious financial distress throughout the region. In response, the framers of the Constitution and the Alaska Legislature took active and far-sighted steps to first establish a state run hatchery system and, shortly thereafter, the private non-profit and regional hatchery regime that has consistently stabilized the runs and enhanced salmon harvests throughout the state since 1976. Overall, Alaska's hatcheries have been a remarkable success and have helped the state's salmon resources to thrive and expand over the past 40 years, creating millions of dollars of positive economic impact, without any demonstrable harm to wild salmon stocks.

From the very beginning, every aspect of Alaska's hatcheries' creation, operation, and production have been closely supervised and regulated by the Department, with harvest area and allocation decisions made by the Board. This division of responsibility has served Alaska well for many years and there is no good reason to abandon it now.

For these reasons, the Board should deny the Petition.

ASHBURN & MASON P.C.

ASHBURN & MASON, P.C.

Matthew T. Findley

for:

A. William Saupe

Laura C. Dulic

PSVOA
PURSE SEINE VESSEL OWNERS' ASSOCIATION
1900 W Nickerson St., Ste. 320 ■ Seattle, WA 98119 ■ Tel: (206) 283-7733 ■ Fax: (206) 283-7795 ■ www.psvoa.org

October 2, 2018

VIA E-MAIL

John Jensen, Chair
Alaska Board of Fisheries
P.O. Box 115826
Juneau, AK 99811

Re: Oppose ACR 1 & 2 Reductions to Salmon Enhancement Programs
Oppose ACR 10 Closure of the Sitka Sound Commercial Sac Roe Fishery

Dear Chair Jensen Board of Fisheries Members:

The Purse Seine Vessel Owners Association ("PSVOA") respectfully submits the following comments in opposition to ACR 1, 2, and 10. PSVOA represents purse seine vessel owners throughout Alaska and the Northwest, including seiners who participate in the Southeast Alaska and Prince William salmon seine fisheries, and the Sitka Sound commercial sac roe fishery.

ACR 1 – This proposal was submitted previously in a similar form as an "emergency petition" on two separate occasions. The Board denied the petition each time. As an ACR, this proposal should be rejected as well because it fails to satisfy the criteria for an out of cycle proposal.

Alaska's hatcheries, including the hatchery which is the purported subject of this ACR, are managed through a collaborative and public process involving ADF&G, the Regional Planning Team, and the Valdez Fishermen's Development Association. This process involves input from interested stakeholders. Any action taken by the Board in response to this ACR will only serve to undermine the collaborative efforts of these organizations and the individuals they represent.

Moreover, the science underlying the theory that Alaska's salmon hatcheries are somehow responsible for the recently observed decline in some salmon species in certain regions of Alaska is speculative, at best. In contrast, the tremendous economic benefits Alaska's salmon hatcheries provide commercial fishing families and Alaska's coastal communities are well-documented.

For the reasons stated above, PSVOA respectfully requests that the Board deny ACR 1. At best, ACR 1 is premature. The Board has asked for information during the October 15-16 Work Session. ADF&G will present numerous documents and summarize the best available science, which will debunk the unproven theories and misinformation which underly ACR 1.

ACR 2 – This draconian proposal is completely unfounded, and, like ACR 1, it is premature. The current Board has determined that it wants to undertake a review of the state's salmon enhancement program at the October 2018 work session. PSVOA applauds the Board's decision to

undertake such a review. During the review, the Board will learn about the salmon enhancement program, and review the science upon which the enhancement program is based. In addition, the Board will be given a presentation on the most recent data collected in ADF&G's ongoing Hatchery Wild Interaction Research study and the North Pacific Anadromous Fish Commission's ocean carrying capacity science.

PSVOA respectfully requests the Board reject ACRs 1 & 2, which would unnecessarily rescind ADF&G's NPA for 20 million VFDA pink salmon eggs. Even considering these ACRs before receiving a briefing on the science referenced above and other relevant information would be premature and a disservice to those who rely on Alaska's enhancement program for commercial and recreational harvest.

ACR 10 – A nearly identical proposal to eliminate the commercial Sitka Sound herring sac roe fishery was rejected by this Board in January 2018. The author of the proposal has not come forward with any new information since the Board's decision in January. Accordingly, ACR 10 does not satisfy the criteria for acceptance as an ACR. ADF&G's ASA herring model has been successful in sustaining the Sitka Sound herring stock for many years while providing opportunities for commercial harvest, which is closely monitored. To its credit, ADF&G has initiated outside peer review of the ASA model by leading researchers at the University of Alaska and University of Washington. In addition, ADF&G is presently conducting research to determine the maturity at age composition of the Pacific herring in Sitka Sound. PSVOA respectfully requests the Board deny this ACR.

PSVOA appreciates the opportunity to comment on these ACRs, and thanks the Board for its consideration of the same.

Very truly yours,

/s/ Robert Kehoe

Robert Kehoe, Executive Director
Purse Seine Vessel Owner's Ass'n

Raymond M May, F/V Sitkinak

Po Box 8985

Kodiak, Alaska 99615

Board of Fisheries

October 15-16 Work Session

Anchorage, Alaska

October 3, 2018

RE: Agenda change requests ACR 1,2 and 10

Dear Chairman Jensen and Board of Fish Members:

I was born and raised on Kodiak Island. I'm an Alaska Native fisherman that is enrolled in two tribes (Native Village of Port Lions & Native Village of Afognak), along with being a shareholder of three Native Corporations (Leisnoi Inc., Afognak Native Corp., & Koniag Inc.). I've been a subsistence, sport, & commercial fisherman in Alaska for 39 years. I don't believe ACR 1,2 and 10 should be taken up out of cycle.

Why would the board decide to take up ACR 1 and 2 on salmon hatchery egg take after two board members called a special meeting in May and July on the same issues? We just went thru the ACR 10 herring issue January 2018 in Sitka. Is there really new information on any of these issues? I personally saw plenty of herring biomass to warrant enough fish for a subsistence harvest in the Sitka Sound sac roe fishery all of the last four years. Permit holders have taken a conservative effort to ensure a healthy future in this fishery.

As a commercial fisherman I have a business plan to execute & pay for this permit I purchased 4 years ago. I do not see any biological reason to reduce harvest rate or strategy. Alaska has the best managed fisheries in the world. I have only seen the ADF&G conservatively manage Sitka herring sac roe fishery as the overall biomass of herring around Sitka Sound has increased over the past 40 years. There is plenty of data already presented to you this year to support my stance on these ACR's. Thank you for your time & consideration.

Sincerely,

Raymond May

Owner, F/V Sitkinak

Submitted By
Richard Dane Eckley
Submitted On
10/3/2018 12:33:39 PM
Affiliation
fisherman

Date: 10/3/2018
Fisherman: Richard D Eckley
Vessel: F/V Ariel
Homeport: Cordova, Alaska

To: Alaska Board of Fisheries

RE: Comments on Hatchery Related ACRs

Dear Chairman Jensen and Board of Fisheries Members,

I am a commercial fisherman from Prince William Sound. I oppose the acceptance of ACR 1 and ACR 2.

ADFG Staff comments regarding these ACRs found no purpose or reason for a conservation concern. The ACRs do not correct an error in regulation. The ACR does not address an effect of a regulation on a fishery that was unforeseen when that regulation was adopted.

For these reasons, ACR1 and ACR2 do not meet the criteria for the Board of Fisheries to accept these Agenda Change Requests.

Additionally, Alaska's salmon hatchery program is integral to the economic sustenance of rural communities. Hatcheries support sport, personal use, susbsistence, charter, and commercial fisheries throughout the state, and provide tax revenues for local and state governments.

The hatchery programs are heavily science-based and decisions regarding hatchery production rely heavily on current data. There are no stocks of concern where most hatchery production occurs and historically, hatchery production has alleviated pressure on wild stocks.

Hatcheries should continue to be overseen by the Regional Planning Teams and ADFG biologists, who know and understand the history of salmon enhancement in Alaska.

Thank you for your consideration.

Signed, Richard D Eckley

Submitted By
Rob Nelson
Submitted On
10/3/2018 11:35:34 AM
Affiliation

Chairman Jensen and members of the board,

My name is Rob Nelson, I am a lifelong Alaskan, commercial fisherman and sportsfishing enthusiast.I grew up on the southern Kenai peninsula before and during the development of our hatchery system. I have seen first hand the benefits of enhancement efforts throughout the state to all user groups.

There are three ACR's I'd like to comment on. First is ACR !, the proposal to destroy 20 million pink salmon fry at the Solomon Gulch hatchery. WOW! Who would have thought a group would petition to destroy salmon. The 20 million fry in question are a result of a long review and permitting process between VFDA and ADFG. Aside from the obvious benefits on the commercial side, I would you to personally observe the throngs of sportfishermen lining the beaches around the head of Port Valdez and see the steady stream of pink salmon coming thru the fish cleaning stations around the harbor. There is no biological reason to destroy these salmon that are destined to provide additional opportunities and the resulting benefits to commercial, sport, state and associated services.

ACR 2, Are we really trying to call up an alleged political promise from 18 years ago. Its kinda hard to even add to that. From my perspective, both these ACR's have roughly the same goal, and that is to cut hatchery production with the misguided thought that would result in increased Chinook returns. Of course it is ironic since a large portion of our Chinook sport harvest is of hatchery origin ie: Kasilof river, Ship creek, Homer spit etc. I would also like to address the pink salmon straying in Lower Cook Inlet that has caused such an uproar. First I'd like to note that some of the identified streams like Fritz Creek and Beluga Slough do not have established salmon runs. Occasionally fish appear in these creeks on a sporadic basis. Virtually every fish that does show up is a stray, hatchery origin or wild. It is in salmon DNA, part of their survival stratagy that has made the species so successful. There is plenty of documented examples and research on the straying habits of all salmon species.

ACR 10, This is just another attempt to become the sole allowable user group of this resource. A blatant disregard to sound science, research and state management. The Sitka herring stock is viewed around the world as the gold standard in science based, responsible fishery management. This was just before the board just 9 months ago. Once again there is no justification for this ACR. Thank you for your time, I'd be happy to discuss these issues further at your convenience.

Submitted By
Robert R Eckley
Submitted On
10/3/2018 12:13:55 PM
Affiliation
fisherman

Date: 10/3/2018
Fisherman: Robert R Eckley
Vessel: F/V Ariel and F/V Dreadnought
Homeport: Cordova, Alaska

To: Alaska Board of Fisheries

RE: Comments on Hatchery Related ACRs

Dear Chairman Jensen and Board of Fisheries Members,

I am a commercial fisherman from Prince William Sound. I oppose the acceptance of ACR 1 and ACR 2.

ADFG Staff comments regarding these ACRs found no purpose or reason for a conservation concern. The ACRs do not correct an error in regulation. The ACR does not address an effect of a regulation on a fishery that was unforeseen when that regulation was adopted.

For these reasons, ACR1 and ACR2 do not meet the criteria for the Board of Fisheries to accept these Agenda Change Requests.

Additionally, Alaska's salmon hatchery program is integral to the economic sustenance of rural communities. Hatcheries support sport, personal use, susbsistence, charter, and commercial fisheries throughout the state, and provide tax revenues for local and state governments.

The hatchery programs are heavily science-based and decisions regarding hatchery production rely heavily on current data. There are no stocks of concern where most hatchery production occurs and historically, hatchery production has alleviated pressure on wild stocks.

Hatcheries should continue to be overseen by the Regional Planning Teams and ADFG biologists, who know and understand the history of salmon enhancement in Alaska.

Thank you for your consideration.

Signed, Robert R Eckley and Family

Submitted By
Russell Cabana
Submitted On
9/27/2018 2:05:47 PM
Affiliation
PWS Permit holder

Concerning ACR 1.

First off this should not be brought up during a non-PWS cycle. I understand the concern for chinook and sockeye salmon returning to the Kenia river, but to blame it on the PWS Hatchery programs is wrong. I would very much like to see the scientific research studies and agency reports that document the adverse impacts on wild salmon and other wildlife from increased food competition in the North Pacific Ocean and what the Negative impacts are. Mainly because over the last ten years PWS has seen some of its largest natural runs on record. On the straying concern Pink salmon straying is natural accuring and has been going on well before the introduction of Hatchery stocks. As for the Increased food competition, from what I've read on the ADF&G website and seen first hard out in the ocean, Chinook and Pink salmon have completely different diets in the ocean. Pink salmon feed the most in their last few months before returning to spawn where they eat a large number of pink salmon fry leaving to the ocean. Based on the ADF&G website Chinooks main threats are overfishing, dams, habitat loss, habitat degradation, and climate change. Most of which occurs within the river which returning to. So unless there is some hard evidence of direct coralation between the two, I do not understand why this is on the up coming 10/3 Work Session.

Submitted By
Russell Cabana
Submitted On
10/2/2018 11:39:05 AM
Affiliation
PWS seiner

Concerning the ACR 1 and 2, hatcherys have always been a huge part of Alaska's fisheries and create a great source of taxable income for the state and its communities. Cutting back on hatchery programs would not only hurt Alaska's economy, but hard working Alaskan's as well. The issue stated in ACR 1 needs to be solved in the Kenia Rivier itself and not from Hatchery's around the state!!

Submitted By
Sharon Tuttle
Submitted On
10/3/2018 3:24:57 PM
Affiliation
None

Phone
907 488-7678
Email
tutfam@ptialaska.net
Address
3520 Wildwood Dr
North Pole, Alaska 99705

I oppose any limitations to Alaska's hatcheries and the production of salmon. A significant sector of Alaska's population depends on fishing and its supporting industries for their income and livelihood. Our state and its citizens already face budgetary challenges and repercussions as the State faces more and more budgetary reductions in funding and available resources. Approving hatchery limitations would do nothing to move our state forward and out of its current fiscal situation.

I would respectfully ask the Board not to support hatchery limitations, but rather, work with industry experts, statewide commercial fisherman, and the public to explore innovative options and efficiencies to expand this valuable state resource, rather than limit it.

Thank you for the opportunity to comment and your time for considering all the input provided.

Silver Bay SEAFOODS
Sitka ✦ Craig ✦ Valdez ✦ Naknek ✦ Metlakatla
P.O. Box 1741 Cordova, AK 99
Phone: (907) 738-7202

October 3, 2018

Chairman John Jensen
Alaska Board of Fisheries
Boards Support Section
PO Box 115526
Juneau, AK 99811
Submitted via email: dfg.bof.comments@alaska.gov

RE: Comments on hatchery-related Agenda Change Requests

Dear Chairman Jensen and Alaska Board of Fisheries Members:

Silver Bay Seafoods, LLC (Silver Bay, or SBS) is opposed to Agenda Change Requests (ACRs) 1 and 2 currently under consideration by the Alaska Board of Fisheries (BOF, or board) at its October 15 and 16 Work Session in Anchorage. Silver Bay recommends that the Alaska Board of Fisheries confirms Alaska Department of Fish and Game's (ADF&G) assessment of ACRs 1 and 2, including: a) there is not a fishery conservation purpose or concern, b) the agenda change request does not correct an error in regulation, and c) the agenda change request does not address an effect of regulation on a fishery that was unforeseen when the regulation was adopted. Apart from consideration of the many technical arguments which will be heard refuting the proposers' claims, Silver Bay does not believe that these ACRs meet the criteria for being heard outside of their regular cycle.

Silver Bay Seafoods is a vertically integrated, primarily fishermen-owned processor of frozen salmon, herring, and other seafoods products for both domestic and export markets. Silver Bay began in 2007 as a single salmon processing facility in Sitka, Alaska, and has since grown into one of the largest seafoods companies in Alaska. Silver Bay has state of the art, high volume processing and freezing facilities throughout Alaska, currently operating in Sitka, Craig, Valdez, Naknek and Metlakatla. The Company is also active in the California Loligo squid fishery.

Silver Bay Seafoods opposes the Kenai River Sportfishing Association's (KRSA) petition for an ACR (ACR 1) and their requests to prohibit the Valdez Fisheries Development Association (VFDA) from incubating, rearing, and releasing pink salmon resulting from additional egg take capacity permitted in 2018, and to cap VFDA's Solomon Gulch Hatchery (SGH) egg take capacity at the level permitted in 2017. **Silver Bay Seafoods recommends that the BOF confirms Alaska Department of Fish and Game's (ADF&G) and the board's previous findings for a lack of emergency with regards to similar iterations of this proposal, denies KRSA's request for an ACR, and further recommends that the board take no action to reduce the permitted pink salmon egg take capacity at SGH.**

Silver Bay began participating in the Prince William Sound (PWS) commercial salmon fishery in 2010, maintains a significant market share in the fishery, and is interested in ensuring its long-term sustainability and viability. Following the record-setting season of 2015 in which the PWS management area's salmon

harvests and estimated ex-vessel values were among the best in the state for the third time in a handful of years (2010, 2013, and 2015), Silver Bay embarked on an expansion of its operations in Valdez. Hundreds of Alaskan electricians, fabricators, general contractors, and other skilled trades workers constructed a 65,000-square foot processing facility with a daily capacity to process 2.7 million round pounds of salmon per day. Complete with an ikura processing mezzanine and salmon oil plant, the company also constructed an adjacent 17,000 square foot 206-bed bunkhouse, thereby increasing its capacity to house a 450-person workforce to operate the facility. Altogether, Silver Bay invested many tens of millions of dollars in its new facilities in Valdez. As part of this expansion, Silver Bay also grew its harvesting fleet to a total of 60 fishermen-owners who have invested in the company and their Valdez plant, and who share in the company's success. Silver Bay's fleets and their families are provided with an opt-in health insurance plan, and participate directly in the company's management decision-making processes.

Silver Bay Seafoods and its fishermen-owners pursued this expansion based in part on their shared experiences in the PWS salmon fishery, and a faith in ADF&G's and the BOF's consistent science-based management of the area's salmon fishery resource. Silver Bay and its fishermen-owners participate in many of the forums associated with this fishery, including service on boards of directors for the area's hatchery operators, and engagement with private-public collaborations which exist between commercial fishery participants and ADF&G. This includes participation in the local regional planning team process which, after thorough review of VFDA's Permit Alteration Request in 2014, approved a gradual and staggered increase in permitted pink salmon egg capacity, culminating with VFDA's 20-million egg increase at SGH in 2018.

Silver Bay is aware of ADF&G Lower Cook Inlet (LCI) stream sampling efforts in 2017, which resulted in the documentation of an estimated 214 PWS hatchery pink salmon being found in ten LCI streams with escapement goals. Although the proposers of ACR 1 assert that these fish represent an unacceptable level of pink salmon produced by PWS hatcheries, we note ADF&G Commissioner Cotten's June 14 Memo to the Alaska Board of Fisheries which states that not enough information is currently available to determine whether these fish present a threat to fish or game resources. What is known is that these sampling efforts were opportunistic and scientifically inconclusive by nature and design, and their findings of PWS hatchery fish represent a scant .1% (0.001) of these streams' midpoint Sustainable Escapement Goal (SEG) range as reported by Otis et al. (2016).

With regards to the proposers' reference to recent scientific publications which they argue cause great concern for the biological impacts associated with PWS hatchery production, we refer you to the Alaskan hatchery operators' critique of the proposers' previously cited publications submitted as PC003 for the July 17, 2018 Alaska Board of Fisheries Emergency Petition Meeting in Anchorage. It is our understanding that a more detailed review of these publications will be provided to the board at its October Work Session meetings. Many of the publications previously cited by KRSA are irrelevant to the discussion at hand, with some deserving of little credibility within the scientific community. Silver Bay recommends instead that the Alaska Board of Fisheries continues to familiarize itself with and supports the ongoing Alaska Hatchery Research Project (AHRP) which was designed and is conducted at great expense to explore potential interactions between hatchery and wild salmon in PWS. The AHRP may be found further described at:

http://www.adfg.alaska.gov/index.cfm?adfg=fishingHatcheriesResearch.current_research

The proposers of ACR 1 further assert that PWS pink salmon releases appear to be jeopardizing marine survival of wild stocks of sockeye and Chinook salmon throughout the North Gulf Coast of Alaska, although widely accepted peer reviewed data do not support this claim. For example, Ruggerone and Irvine (2018) report that total abundance (catch plus escapement) of natural-origin sockeye salmon returning to the South Peninsula, Kodiak, Cook Inlet, PWS, and Southeast Alaska regions has increased in recent years from an average of 2.2 million fish per year for the years 1952–2005, to an annual average of 3 million fish for the years 2006–2015. This increasing trend holds true for the entirety of natural-origin sockeye salmon stocks returning to Asia and North America, with total abundance averaging 85.2 million fish annually for the years 2006–2015, versus an average annual abundance of 65.4 million fish for the years 1952–2015. Wild pink and chum salmon have also experienced record production throughout the North Pacific Ocean in recent years, with Ruggerone and Irvine (2018) reporting total natural-origin pink salmon returns to Asia and North America as having increased from an annual average of 261 million fish for the years 1952–2005, to 406 million fish annually during the years 2006–2015. Finally, Ruggerone and Irvine (2018) report a total average annual abundance of natural-origin chum salmon in Asia and North America of 47.6 million fish for the years 1952–2005, increasing to 63.1 million fish annually in 2006–2015. None of these findings are supportive of the proposers' claims for harm to wild salmon stocks due to PWS hatchery pink salmon production.

Recent downturns in Chinook salmon abundance throughout Alaska have been well documented, although the cause for such declines is unknown. Using Kenai River Chinook salmon as an indicator for potential interactions with PWS pink salmon provides some results that counter ACR 1's claims. Total abundance estimates for Kenai River Chinook salmon do not have as long of a time series available as previously reported in Ruggerone and Irvine (2018), with Kenai River Chinook salmon abundance estimates available since the mid-1980s. However, it should be noted that Fleishman and Reimer (2017) report total Kenai River Chinook salmon abundance estimates in 2004 and 2005 which serve as the highwater marks for this stock for the years 1986–2015 – some 28 and 29 years following the first releases of hatchery pink salmon fry in PWS. Further, preliminary estimates from the 2018 season indicate upticks in productivity and escapements for Copper River Chinook salmon in Southcentral Alaska, and for Chilkat River, Unuk River, and some hatchery Chinook salmon stocks in Southeast Alaska as well.

It should also be noted that hatchery pink salmon production in PWS has been relatively stable for decades. Starting in 1991, SGH was permitted to take 230 million green pink salmon eggs annually and did so for the following 23 years. In this time, industry and fishery management successfully developed innovative and effective approaches to ensure that ADF&G's wild stock objectives have been met while maximizing the value of the available resource. This success allowed VFDA to diversify and expand its operations to benefit the area's sport fish user groups. For example, it is estimated that VFDA hatchery production accounts for 75% of all coho and 90% of all pink salmon caught by sport fish anglers in the Valdez area, and the total sport fish economic output for VFDA is estimated at $6.6 million annually. These programs are largely paid for through the cost recovery harvest of hatchery pink salmon, the revenue from which comprises an overwhelming proportion of VFDA's budget. Thus, any decrease in pink salmon production as is recommended by ACR 1's proposers may reduce VFDA's capacity to support those hatchery programs which benefit noncommercial fishery participants the most.

Finally, it is estimated that salmon harvested in the VFDA pink salmon fishery represents 30–40% of the seafood product produced annually at the SBS Valdez plant. If the proposals discussed in this letter were to be acted on by the board during its 2018/2019 cycle, individuals and entities associated with Silver Bay Seafoods' Valdez plant operations – including 60 seine vessel captains; 210 seine crew members; 25 tender operators and their 100 crew members; over 400 seafood processors; local shipping companies, such as Alaska Marine Lines and Samson Tug and Barge, and their employees; 6 spotter pilots; local restaurants, coffee shops, grocery stores, bars, hotels, gear stores, fuel docks, rental cars and taxi companies – would be harmed. Further, the City of Valdez would see significant reductions in revenues to their electrical and harbor departments and declines in revenues from raw fish taxes and sales taxes as well. Altogether, VFDA estimates that a 20-million green egg reduction at SGH would result in a loss of over $1.7 million annually to PWS common property fisheries.

Likewise, Silver Bay Seafoods is opposed to ACR 2, which seeks to reduce the statewide private non-profit salmon hatchery egg take capacity to 75% of permitted levels in 2000. If the board were to follow this ACR's recommendations, it would result in significant losses to commercial salmon fisheries in PWS and Southeast Alaska. For example, this would reduce PWS pink salmon production by approximately 291 million eggs relative to 2018 production, chum salmon by another 70 million eggs, sockeye salmon by 5.26 million eggs, and coho salmon by just under 800,000 eggs. Using some basic assumptions, this would result in a loss of up to $50 million annually to common property fisheries in PWS, with similarly catastrophic impacts for regional communities, processors, and supporting industries. Much of the same could be expected for Southeast Alaska as well, despite little justification having been provided in support of ACR 2 by its proposer.

Again, Silver Bay Seafoods recommends that the BOF confirms Alaska Department of Fish and Game's (ADF&G) and the board's previous findings for a lack of emergency with regards to a similar iteration of ACR 1, denies KRSA's request for an ACR, and further recommends that the board take no action to reduce the permitted pink salmon egg take capacity at SGH. Similarly, Silver Bay recommends that the board takes no action on ACR 2, and likewise denies its inclusion on the agenda for the board's Statewide Finfish Meeting in March 2019. Instead, Silver Bay urges the board to continue with its previous plans to convene an informative meeting at its October Work Session in Anchorage, followed by a systematic review of hatchery production in each of the State's management areas during regularly scheduled board cycle meetings over the next several years.

We hope that the points raised in these comments provide you with additional information to aid you in your final determinations regarding ACRs 1 and 2. Thank you for your service to this valuable resource and the communities that depend on it.

Sincerely,

Tommy Sheridan
External Affairs
Silver Bay Seafoods
tommy.sheridan@silverbayseafoods.com

References cited

Fleischman, S. J, and A. M. Reimer. 2017. Spawner-recruit analyses and escapement goal recommendations for Kenai River Chinook salmon. Alaska Department of Fish and Game, Fishery Manuscript Series No. 17-02, Anchorage.

Otis, E. O., J. W. Erickson, C. Kerkvliet, and T. McKinley. 2016. A review of escapement goals for salmon stocks in Lower Cook Inlet, Alaska, 2016. Alaska Department of Fish and Game, Fishery Manuscript Series No. 16-08, Anchorage.

Ruggerone, G. T., and J. R. Irvine. 2018. Numbers and biomass of natural- and hatchery-origin pink salmon, chum salmon, and sockeye salmon in the North Pacific Ocean, 1925–2015. Marine and Coastal Fisheries: Dynamics, Management, and Ecosystem Science (10): 152–168.

Silver Bay SEAFOODS
Sitka ✦ Craig ✦ Valdez ✦ Naknek ✦ Metlakatla
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Phone: (907) 738-7202

October 3, 2018

Chairman John Jensen
Alaska Board of Fisheries
Boards Support Section
PO Box 115526
Juneau, AK 99811
Submitted via email: dfg.bof.comments@alaska.gov

RE: Comments on Agenda Change Request 10

Dear Chairman Jensen and Alaska Board of Fisheries Members:

Silver Bay Seafoods, LLC (Silver Bay, or SBS) is opposed to Agenda Change Request 10 currently under consideration by the Alaska Board of Fisheries (BOF, or board) for deliberation at its October 15 and 16 Work Session in Anchorage, and thanks the board for the opportunity to comment on this important issue. Silver Bay recommends that the Alaska Board of Fisheries confirms Alaska Department of Fish and Game's (ADF&G) assessment of ACR 10, including: a) there is not a fishery conservation purpose or concern, b) the agenda change request does not correct an error in regulation, and c) the agenda change request does not address an effect of regulation on a fishery that was unforeseen when the regulation was adopted. Apart from consideration of the many technical arguments which will be heard refuting the proposers' claims, Silver Bay does not believe that this ACR meets the criteria for being heard outside of its regular cycle.

Silver Bay Seafoods is a vertically integrated, primarily fishermen-owned processor of frozen salmon, herring, and other seafoods products for both domestic and export markets. Silver Bay began in 2007 as a single salmon processing facility in Sitka, Alaska, and has since grown into one of the largest seafoods companies in Alaska. Silver Bay has state of the art, high volume processing and freezing facilities throughout Alaska, currently operating in Sitka, Craig, Valdez, Naknek and Metlakatla. The Company is also active in the California Loligo squid fishery. Silver Bay began participating in the Sitka Sound commercial sac roe herring fishery in 2008, maintains a significant market share in the fishery, and has an interest in ensuring its long-term sustainability and viability.

Silver Bay opposes ACR 10, which seeks to close the Sitka Sound commercial sac roe herring fishery. Other fishery participants will undoubtedly provide technical arguments and supporting documentation in response to ACR 10. However, our comments will focus on the collaborative opportunities identified during the January 2018 Southeast and Yakutat Finfish and Shellfish meetings in Sitka. Namely, during that meeting, Southeast Herring Conservation Alliance (SHCA) submitted RC 379 for public consideration, which was received favorably by industry, representatives of Sitka Tribe of Alaska (STA), and BOF members:

http://www.adfg.alaska.gov/static/regulations/regprocess/fisheriesboard/pdfs/2017-2018/se/rcs/rc379_Southeast_Herring_Conservation_Alliance_Subsistence_Herring_Eggs.pdf

Similarly, RC 380 was also submitted to the board by Alaska Native Inter-Tribal Association (ANITA) and SHCA for consideration as a mechanism to protect the Sitka Sound herring fishery resource in perpetuity for all users including subsistence herring egg harvesters, commercial fishermen, and the community of Sitka:

http://www.adfg.alaska.gov/static/regulations/regprocess/fisheriesboard/pdfs/2017-2018/se/rcs/rc380_Southeast_Herring_Conservation_Alliance_Subsistence_Herring_Eggs.pdf

Silver Bay Seafoods expressed strong support of RCs 379 and 380 previously, and remains committed to these collaborative endeavors.

In response to these gestures, it is our understanding that STA expressed gratitude for industry's willingness to work with the Tribe in a cooperative and collaborative manner. It is our further understanding that SHCA and industry made good faith efforts to ensure that SHCA herring egg harvests were conducted in such a way as to reduce potential conflict between SHCA and subsistence harvesters. And though STA ultimately did not enter into a cooperative agreement with SHCA and ANITA, it is our understanding that the Tribe did agree to present this offer to a working group who will make a recommendation to the Tribal Council. Silver Bay Seafoods views this dialogue as a step in the right direction, and encourages all stakeholders to embrace the promise and possibilities that remain with RC 379 and RC 380.

For example, with regards to RC 379's "Workforce Development" component, ample opportunities remain in Sitka for collaboration between industry, STA, and others to better utilize local fisheries as educational platforms for local students. The University of Alaska Southeast Fisheries Technology Program in particular has a history of working with industry and Native organizations to promote fisheries education for high school students, and has recently been awarded a National Science Foundation (NSF) grant for a project called "Enhancing Aquaculture: education for underserved Alaskan communities to promote workforce development in fishing industries." The main goal of the grant is to develop a semester-long aquaculture intensive in Sitka, Alaska, in partnership with local hatchery programs operated by Northern Southeast Regional Aquaculture Association (NSRAA) and Sitka Sound Science Center (SSSC):

http://salmonculturesemester.alaska.edu/index.html

Further, a planned March 2019 Alaska Chapter American Fisheries Society (AFS) conference in Sitka presents an excellent opportunity to achieve RC 379's "Improved community relations through collaborative educational/social event" component. Silver Bay recommends that industry and STA work together to ensure that this event provides an educational opportunity for all parties to include scientific presentations, and social/community gathering(s) designed around the conference's format.

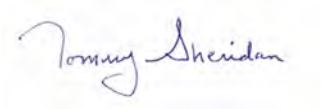
Finally, Silver Bay respectfully disagrees with ACR 10s assertions that the 2018 commercial fisheries' failure to harvest the season's Guideline Harvest Level (GHL) is indicative of biological concern for the fishery resource. Instead, it should be noted that 60% of the forecast biomass in 2018 was below industry's minimum size threshold to satisfy market requirements, thereby making shortfalls in commercial harvest likely during the 2018 season.

Although the preliminary estimates reported by ADF&G indicate lesser Sitka Sound total spawn mileage in 2018 relative to the previous 10-year average, initial indications are for spawn deposition extending nearly twice as far offshore in 2018 as was the case in 2017, and with higher egg density. Due to exceptional spawn observed along the Kruzof Island shoreline in particular, the 2018 herring spawning biomass was much higher than was apparent from the spawn mileage alone, according to ADF&G. Final results from ADF&G's 2018 herring stock assessment for Sitka Sound will be available in November 2018, although the department currently estimates that the Sitka Sound herring population size did not change appreciably between 2017 and 2018.

Again, Silver Bay Seafoods recommends that the BOF denies the proposers' request for the inclusion of ACR 10 on the agenda at the board's Statewide Finfish Meeting in March 2019. Instead, Silver Bay urges that Sitka Sound fishery resource stakeholders continue to make progress with regards to RC 379 and RC 380, including the creation of workforce development opportunities for local students, and an informational forum at the proposed AFS conference in Sitka this coming spring.

We hope that the points raised in these comments provide you with additional information to aid you in your final determinations regarding ACR 10. Thank you for your service to this valuable resource and the communities that depend on it.

Sincerely,



Tommy Sheridan
External Affairs
Silver Bay Seafoods
tommy.sheridan@silverbayseafoods.com

Submitted By
Sonja Nelson
Submitted On
9/24/2018 8:27:53 AM
Affiliation

Members of the Board of Fisheries, I am submitting comments in regard to ACR1 and ACR2, I am strongly OPPOSED to these politically driven, propaganda based proposals. I am a Lower Cook Inlet seine permit holder and recognize the contribution to statewide fisheries that hatcheries provide. The claims in the ACR's have no scientific basis and are purely speculative driven by personal bias. There is no legitimate reason for these proposals to be taken up out of cycle, no emergency exists. Thank you, Sonja Nelson

Southeast Alaska Fishermen's Alliance

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October 3, 2018

Board of Fish
Alaska Dept of Fish & Game
John Jensen, Chair
PO Box 115526
Juneau, AK 99811

Dear John Jensen, Chair and Board of Fish Members,

Southeast Alaska Fishermen's Alliance (SEAFA) is a mul -gear/mu -species non-profit organiz on represen ng our 330+ members involved in the salmon, crab, shrimp and longline fisheries of Southeast Alaska. Enclosed are our comments on the Agenda Change Requests being considered at the October work-session and add onal comments for conside on.

ACR 1 - Prohibit VFDA from incubating, rearing, and releasing pink salmon resulting from additional egg take capacity permitted in 2018 and cap egg take capacity (KRSA):
OPPOSE

SEAFA agrees with ADF&G's opinion in RC 2 staff comments evalua on that this proposal does not meet any of the three criteria for acceptance as an agenda change request and has been the subject of several emergency p ons. The underlying arguments of the previous pe ons was straying and ocean carrying capacity. Submi ed for this work-session is a paper by Alex Wertheimer and William Heard tled *High Ocean Biomass of Salmon and Trends in Alaska Salmon in a Changing Climate.* We agree with the conclusions of this work by Heard & Wertheimer. We also ended the North Pacific Anadromous Fish Commission (NPAFC) me oned in the paper with pa cip on from all the Pacific Rim Countries on ocean carrying capacity and came away from that m ng no longer concerned about ocean carrying capacity. For the issue of salmon straying, that is a fundamental aspect of salmon. Without straying

there would be no salmon in the inside waters of SE Alaska as they use to be covered by glaciers.

ACR 2 - Cap statewide private non-profit salmon hatchery egg take capacity (Virgil Umphenour): **OPPOSE**

SEAFA agrees with ADF&G's RC 2 evalua on that this proposal does not meet any of the three criteria for acceptance as an agenda change request. We agree with the comments submi ed by the Dept. According to ACR 2 it states that under AS 44.62 BOF has the authority to amend private non-profit hatchery egg takes for produc on. We are not sure how the Alaska Administ ve Procedures Act grants authority over hatchery egg takes. We have read ADF&G's comments in RC 2 as well as the Dept of Law comments from November 6, 1997 and believe that the Board of Fish does not have the authority to reduce hatchery egg take capacity to 75% of the 2000 level as requested in ACR 2. In par cular, page 6 of the Dept of Law memo points to a decision by the Alaska Supreme Court (Peninsula Marke ng Ass'n v. Rosier 890 P.2d 567, 573 Alaska 1995) that points out "to read the limited grant of authority to the Board over hatcheries set out in AS 16.10.440(b) to permit the Board to effec vely veto ***fundamental policy decisions by the department for which there is specific statutory authority***[1] would upset the balance of the statutory scheme chosen by the legislature."

HATCHERY COMMENTS IN GENERAL REGARDING BOTH ACR 1 & 2 AND ALASKA SALMON HATCHERY FORUM BEING HELD DURING THE WORKSESSION

SEAFA fully supports the State of Alaska hatchery program and regulatory process. If you understand and par cipate, the hatchery permitting process is very public and transparent. Hatchery permits go through a very rigorous review through ADF&G gene cs, pathology and management staff which is available for the Regional Planning Team to consider in their recommend on to the Commissioner of ADF&G.

The hatchery program was developed in response to the decline in abundance of salmon in the 1970 and was meant to supplement wild stocks and take pressure off wild stocks when necessary while modera ng the extreme fluctua ons in salmon abundance. The 2018 salmon season is a very good example of mee ng the intent of the hatchery program. Without enhanced salmon in Southeast Alaska it would have been a very poor season for all three gear groups. Seine fishing in Crawfish doubled some of their seasons, hatchery opportuni es helped the gillnet fleet with the restric on from stocks of concern ac on plans and provided chum and coho opportuni es to the troll fleet with the reduced Chinook alloca ons. The hatchery

[1] Emphasis added

fac es are providing you a report on the *Alaska Salmon Hatchery Contribution Estimates to Sport, Personal Use and Subsistence Harvests (1979-2017)* that is very info ve in the effect salmon enhancement has had on these fisheries in addi on to the commercial fisheries. While a good por on of the costs of enhancement comes from "cost recovery" the commercial fishermen also pay a self-assessment tax of up to 3% in many areas that also significantly contribute to the ability for a program to exist.

In the late 1990's early 2000's there were many m ngs between the Board of Fish, ADF&G and public discussing hatchery issues and what authority the Board of Fish has regarding the hatchery program. In the end, hatchery fac es agreed to amend their permits to the amount of fish actually being released at each site (i.e. dissolving latent capacity that existed in the program) and resulted in the Joint Protocol on Salmon Enhancement between the Board of Fish and ADF&G. (#2002-FB-215). SEAFA supports the idea of the Board of Fish holding hatchery forums as proposed in the Joint Protocol to be brought up to date on the hatchery programs and current research and to understand the hatchery releases for the Board cycle they will be ac ng upon that year. **Hatcheries are vital to the economical well-being of the commercial fisheries as well as sport, personal use and subsistence.**

ACR 9 - Align the Southeast Alaska King Salmon Management Plan with the Pacific Salmon Treaty annex (ADF&G): **SUPPORT**

SEAFA supports this ADF&G proposal that provides the mechanism to align spo ish regu ons with the new Pacific Salmon Treaty agreement that was not in place during last winters SE Board cycle. This proposal definitely meets the criteria for acceptance of an agenda change request under sec on (b) The board will, in its discre on, change its schedule for considera on of proposed regulatory changes as reasonably necessary for coordina on of state regulatory ac ons with federal fishery agencies, programs, or laws. Aligning the sport fish regula ons to the new ers in the treaty is important for the conserva on of Chinook Salmon that are at low levels of abundance at this me.

ACR 10 - Close Sitka Sound commercial sac roe herring fishery until regional herring stock status improves, additional research on herring is conducted, and the amount necessary for subsistence is met in at least three consecutive years (Louise Brady & Peter Bradley) : **OPPOSE**

SEAFA opposes this proposal as it does not meet any of the three criteria for acceptance as an ACR. The intent or effect of this proposal was considered and heard during last winter's SE Board of Fish cycle, the appropriate avenue for considera on. This proposal is very alloc ve in

nature and the proposers did not address what new compelling informa on is available for considera on that the Board did not have access to last winter. The herring fishery is intensely managed by ADF&G based on science and protec ng the sustainability of the resource for the future of the resource. Changes have been made to this fishery including at last winter's mee ng to address concerns brought forward by the public. Fishery resources are cyclical in nature and with herring don't always spawn in the exact same loc on. Natural fluctua ons in biomass and spawning behavior do not indicate a collapse in stocks.

ACR 11 - Align regulations for sport fishing services and sport fishing guide services (ADF&G) : **SUPPORT**

SEAFA supports this ADF&G proposal to align sport fishing services & sport fishing guide services regula ons with the change in the status of legisla on sunsetting January 1, 2019. This proposal meets the requirement for an agenda change request by correc ng an error in a regu on as well as (b) coordina ng current regu ons with statute. Maintaining a regist on system for marine waters for sport fishing services and sport fishing guide services is important p cularly for maintaining the commitments made and m ng federal law for the halibut fisheries.

MISC. BUSINESS AGENDA:

Last winter the Board of Fish passed Proposal #150 submi ed by NSRAA for establishing a SHA in Crawfish Inlet with the intent that all gear groups be allowed to par cipate in the area. This was supported by all gear groups (seine, troll & gillnet) during the commi ee of the whole even through there was acknowledgement that the intent for 2018 was for only troll and cost recovery to occur. In hindsight, there was confusion about this proposal and the Board's intent when the return came in substa ally higher and more fish returned then the troll fleet could and handle and more than was needed for cost recovery. A seine fishery was able to be prosecuted strictly because this is in a district that can be opened for harvest of salmon to the seine fishery. The gillnet fleet was not given an opportunity basically because there were confli ng opinions on what the board intent actually was.

In looking back, there were a couple of things that occurred, the public/fishermen were speaking to the proposal as if this was for the terminal harvest area (THA – common property opening) and not strictly a Special Harvest Area (SHA – cost recovery). These two terms get confused and used interchangeably at mes although there is a legal difference between the two. Within the proposal that the board passed the suggested regulatory language that was intended to include gillnet, seine and troll was wri en in bold, and brackets instead of bold and

underlined. The Board needs to clarify what they intended when they passed the proposal. It is our understanding that NSRAA will be submitting an emergency p on with regulatory language to clarify last year's proposal/inte on. **We request the Board to look at this issue and the confusion around it and clarify their intent in the appropriate fashion.**

We will not be at the Board of Fish mee ng but will be listening online to your delibe ons and hatchery discussion. If you have any ques ons regarding our comments above, please feel free to call at any me.

Sincerely,

Kathy Hansen
Execu ve Director

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October 3, 2018

Board of Fisheries
October 15-16, 2018
Work Session Anchorage, Alaska

Re: Oppose ACR 1, ACR 2 & ACR 10, location of the 2021 SE Finfish meeting

Dear Chairman Jensen and Board of Fish Members:

Southeast Alaska Seiners Association (SEAS) respectfully submit comments opposing ACR 1 submitted by KRSA, ACR 2 submitted by Mr. Umphenour, ACR 10 submitted by Louise and Peter Bradley, and gives comments and recommendations for the 2021 SE finfish meeting location.

ACR 1 – This proposal has been submitted by emergency petitions in much the same language, and was voted down twice this year already. As an ACR it fails to meet the necessary criteria for an out of cycle proposal.

- This issue has been voted down twice, the Board has ruled. Industry and the BOF should not be expected to continually answer the same question in the same year. If necessary the BOF should adopt a provision regarding how many times the same issue can be brought before them "out of cycle". This is undue time and expense expended by all the stakeholders, especially the valuable time of the BOF.
- The Board has received a plethora of information pertaining to the insignificance of this increase in production in regard to the scope of production in Alaska and more importantly in the global production that share the same "open grazing range". The research the proponent references in their submission has been thoroughly reviewed, commented on as to its scientific credibility, flaws in research design, and questions and

lenses the Board should consider in looking at these data sources. We believe it needs no further comment.

ACR 2 – How can this Board entertain a proposal that could bankrupt the fishing industry as a whole? We must assume there is a disconnect with the value and significance the hatchery component plays in maintaining financial stability to Alaska's commercial fisheries.

- Alaska's vast and well managed fisheries resources have been the **ONLY** long standing, stable economic engine for Alaska since statehood. When timber declined, **WE** were there, when oil declined **WE** were there, when tourism was in its infancy and it fell hard in the recessions, **WE** were there. We are still here, relevant, resilient, a lifeblood. **WE** are a top economic and employment engine whether any legislative body or governing party lends support, adds taxes, cuts fisheries funding, we survive; why? Because Alaska **IS** fisheries; look at our coastline, no other state or country has our vast coastline that provides sustainable fishery resources that are still not fully utilized.

  This proposal asks you to downsize a **MAJOR** economic engine of the state's economy by cutting their production to 75% of 2000 levels. It asks you to disregard the massive investment of the State and the Industry over the last 18 years. It asks you to forget about the business plans of the State's largest private employer as they have developed over the last 18 years.

  But instead of defending who we are and what we contribute, let's look at it from a similar example;

  - If some proposal would be levied on the tourism industry to cut the cruise ship industry to 75% of 2000 level because of perceived pollution or overtaxing some communities infrastructure, how would that look?

    Holy Smokes! They have built vessels (billions of dollars), communities have spent millions adding docks to accommodate those vessels, local businesses have tours they depend on for their livelihood, restaurants hotels, bars, etc…. you know the drill. Alaska had 1.9 million visitors in 2017 (McDowell). So like hatchery production, let's just single out the cruise ship "production". In 2017, 1.09 million tourists came to Alaska on cruise ships. There is no data available for 2000, but in 2001, 510,000 passengers came to Alaska on cruise ships (State of Alaska 2002). So maybe we think they are ruining our rearing habitat for out-migrating pink salmon and that is why the stocks are in decline, (You could find a better correlation between cruise ships expansion and local fish decline than anything we have seen in recent Board of Fish proposals). Outcome- Cut the cruise ships to **375,750 visitors a year**. That is the equivalent this proposal is suggesting on the fisheries investment that has been made in enhancement

since 2000. There is not a person in Alaska who would support this, and neither should this Board.

ACR 10 - This proposal seeks to take management of the Sitka herring fisheries out of the hands of Fish and Game and prescribe an unresponsive, predetermined, inflexible harvest strategy.

- The BOF, the Department, and the commercial herring harvesters have made significant changes to the fishery in order to address concerns raised by subsistence users.
- Fisheries and all their business partners rely on science based decisions to sustain a positive business model.
- There are 48 permit holders for this fishery, 78% of which are Alaska residents.
- This proposal re-allocates all herring to one user group.
- There is a long history of adjustments to area and guideline harvest levels to respond to changing herring structure dynamics.

We believe the States fisheries biologists should remain in control of setting the harvest levels for this fishery using the best science available and emerging data.

Please consider holding the 2021 BOF finfish meeting in Ketchikan. It is my understanding that The Ted Ferry Civic Center is holding the dates of January 2nd to the 17th available for the BOF meetings pending your confirmation at this work session. Ketchikan has not received the economic benefit of one of these meeting for several years, and its fishermen have had the added burden of travel and lodging expenses to address Board members and participate in the committee of the whole.

Respectfully,

Susan Doherty
Executive Director, Southeast Alaska Seiners Association

1. Alaska Visitor Volume Report Summer 2017 Prepared for: Alaska Department of Commerce, Community, and Economic Development Division of Economic Development July 2018 McDowell Group.

2. ALASKA VISITOR ARRIVALS AND PROFILE SUMMER 2001 Prepared for the State of Alaska Department of Community and Economic Development November 2002

Southern SE Regional Aquaculture Association
14 Borch Street, Ketchikan, AK 99901; Phone: 907-225-9605; FAX 907-225-1348

October 3, 2018

Alaska Board of Fisheries
Mr. John Jensen, Chair

By Electronic Copy Only: dfg.bof.comments@alaska.gov

Re: comments on 2018 Work Session ACR 1 and ACR 2

Dear Chairman Jensen and members of the Board of Fisheries,

Thank you for the opportunity to comment on the above-referenced Agenda Change Requests. The Board's response to these two ACRs is exceptionally critical to Alaskans - perhaps more than any of us even realizes or understands. We implore you to carefully consider the potential impact of these ACRs. The granting of them, in order to "be inclusive and hear more" is not innocuous. It encourages and amplifies the steady drumbeat of those in Alaska who continue to search for a target, with no regard for the robust body of science that is in evidence and is contrary to their assertions. Those who would dismantle Alaska's salmon hatchery system also ignore the best and most obvious evidence – that overall hatchery production levels have been steady for decades, a time period which encompasses many record-breaking returns of both hatchery and wild salmon.

Southern Southeast Regional Aquaculture Association (hereafter "SSRAA") is a regional non-profit salmon hatchery organization formed under state and federal law, and which was originally incorporated in 1976. SSRAA, along with the other regional hatchery associations in the State, along with the associated Private Non-Profit (hereafter "PNP") salmon hatcheries in Alaska, have a substantial interest in the outcome of these ACRs.

SSRAA opposes both ACR 1 and ACR 2. We do so for a host of reasons, which are only summarized here in these individual comments. We ask that you also take into consideration the comments by the other Alaska salmon hatchery organizations, the United Fishermen of Alaska, the seafood processors, the municipalities, the fishermen, and the gear groups that have commented and resolved against and in response to these ACRs. Together, we are Alaska's largest private sector employer. Together, we speak as one.

The subject of ACR 1 is, once again, an attempt to reduce the lawfully permitted capacity of the Solomon Gulch Hatchery operated by the Valdez Fisheries Development Association, Inc. SSRAA opposes this ACR and urges the Alaska Board of Fisheries to

take no action to place this on the agenda for the Statewide Finfish Meeting in March of 2019. This ACR is an issue that the Board has previously reviewed a number of times within the last several months. The Board is now weaware of the existence of a long-term scientific study examining the genetic makeup of pink and chum salmon in Alaska, along with the extent of their straying and the impact on productivity of wild pink and chum salmon due to the straying of hatchery reared salmon.

The outcome of this study will help the Board make decisions such as this… but it is not yet complete. It is critical to allow the management of fisheries to be based on accurate science and to wait for these conclusions, which is exactly how the RFM and MSC sustainability organizations are addressing the certification of salmon hatchery fisheries. To do otherwise is to lessen the distinguished standing of Alaska's fisheries management structure and practice.

In the realm of science as well, the Board has the Department's determination that there is NOT a fishery conservation purpose or reason for either ACR 1 or 2. The Department has determined that these ACRs do NOT correct errors in regulation. Finally, the Department's experts have determined that neither ACR addresses the effect of a regulation on a fishery that was unforeseen when that regulation was adopted. SSRAA respectfully requests that the Board use the information that its experts have provided, and not take up ACR 1 or ACR 2.

ACR 2, which is a bold challenge to the Board's open and democratic process, is quite frankly a disaster. This request should not be taken seriously for any number of reasons, but the damage that this ACR would cause if granted is truly astonishing. Among the damage: aquaculture associations have taken out infrastructure and operating loans from the Department of Commerce as well as from commercial lenders… loans that were contingent upon utilization of the permitted capacity for each organization. If the ability to produce over 37% these fish evaporates with the stroke of a pen, a catastrophic chain of events would cascade upon hatchery organizations and Alaska's commercial fishing industry. And then down upon fishermen, their families and their employees and suppliers.

To highlight the economic output of SSRAA, which of course is only one of the statewide group of hatchery associations, please note the following:

- Annual harvests of SSRAA salmon in common property fisheries in the period 2013 to 2017 averaged 22 million pounds, with an ex-vessel value of $16.8 million. SSRAA's total economic impact in 2017 was estimated at 680 jobs and $32 million in labor income tied to direct impacts in commercial fishing, seafood processing, nonresident sportfishing and SSRAA's own spending and employment.

- SSRAA's relative contribution to harvest values is influenced by year-to-year variations in the abundance of wild pink salmon. SSRAA's peak contributions - more than 40 percent of harvest value in 2017, for example - occur in years with

low pink salmon abundance. In 2013, a year with near-record pink salmon abundance, SSRAA contributed 13 percent of regional salmon harvest value.

- Total economic output associated with SSRAA and the salmon it produces was about $70 million in 2017. Output is a measure of total economic activity, including all labor income, spending on supplies and services, and related multiplier effects.

These are all newly-generated figures from the respected economists at the McDowell Group, work which has also been compiled on a statewide basis and has been submitted by others as comments to the Board for this meeting. For our individual part, SSRAA is also submitting the entire *Economic Impacts of the Southern Southeast Regional Aquaculture Association* report which is included for your reference as an appendix to these on-time comments.

In addition to SSRAA's importance to Southeast Alaska's commercial fisheries, sport harvest of SSRAA salmon has a significant impact on the region's economy. Resident anglers who target SSRAA fish spend money on boats, fishing gear, fuel, and supplies, while non-resident anglers often hire local charter fishing companies that source many supplies locally and provide jobs to local residents.

SSRAA's current estimates for sport fishing is a harvest of 15,865 Chinook and 140,684 coho salmon produced between 2013 and 2017. The average annual Chinook and coho harvest was approximately 3,150 and 28,150 fish, respectively, during this time period.

Again, there have been statewide sport/charter/subsistence/personal use figures generated and included in the submitted PNP paper *Alaska Salmon Hatchery Contribution Estimates to Sport, Personal Use and Subsistence Harvests (1977-2017).* SSRAA urges the Board to review this data and truly understand what a massive impact it would be for the economy and culture of Alaska to have a hatchery programs dismantled.

Thank you for your attention to these issues.

Again, SSRAA vigorously opposes ACR 1 and ACR 2.

Sincerely,

/s /

David Landis
SSRAA General Manager

Enc. *Economic Impacts of the Southern Southeast Regional Aquaculture Association*

Economic Impacts of the Southern Southeast Regional Aquaculture Association

PREPARED FOR SSRAA

August 2018






PREPARED BY McDowell GROUP

Economic Impacts of the Southern Southeast Regional Aquaculture Association (SSRAA)

Prepared for:

SSRAA

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August 2018

Table of Contents

Executive Summary

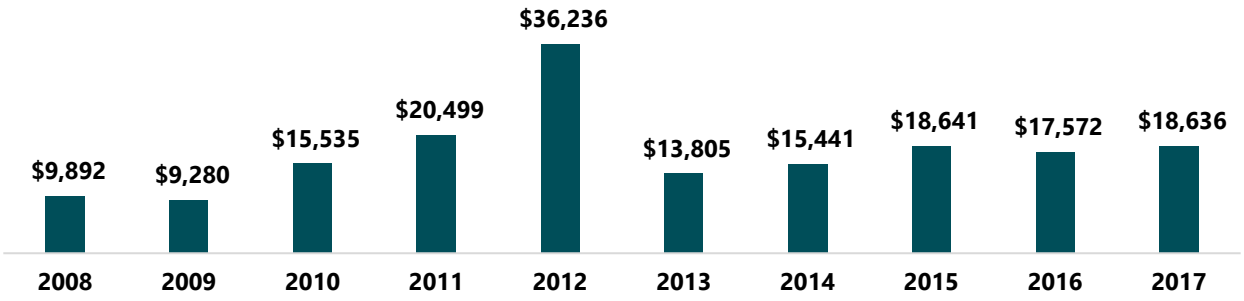
The Southern Southeast Regional Aquaculture Association (SSRAA) is a non-profit corporation headquartered in Ketchikan, Alaska working to enhance the salmon stocks in Southern Southeast Alaska (SSE). This study estimates and describes SSRAA's economic impacts on SSE's commercial fishing, seafood processing, and sportfishing industries. Unless stated otherwise, numbers presented reflect 2013 to 2017 averages.

SSRAA operates seven hatcheries and seven additional release sites throughout SSE, producing and releasing around 170 million salmon smolts annually. SSRAA's operations are primarily funded through cost recovery harvests and a three percent ex-vessel tax on landed salmon in SSE. Between sport harvests, commercial fisheries, and cost recovery activities, about 3.2 million SSRAA salmon are harvested annually.

Commercial Harvest

During the study period, annual harvests of SSRAA salmon in common property fisheries averaged 22 million pounds with an average ex-vessel value of $16.8 million. Chum salmon accounted for 89 percent of the volume and 75 percent of the value of SSRAA's contribution to commercial fisheries during this period. Coho and Chinook production are also important to the region's troll, seine, and gillnet fleets.

SSRAA Salmon Harvest Value, Common Property Fisheries ($000s), 2008-2017



	2013	2014	2015	2016	2017	2013 2017 Average	2013 2017 Percent of Total
Chum	$8,971	8,917	15,940	13,010	15,887	$12,545	75
Coho	3,025	4,714	1,135	3,360	1,547	2,756	16
Chinook	1,792	1,808	1,567	1,202	1,202	1,514	9
Total	**$13,805**	**15,441**	**18,641**	**17,572**	**18,636**	**$16,819**	

As a portion of the overall catch in SSE commercial salmon fisheries, SSRAA is responsible for over half of chum harvests (57 percent from 2008 through 2017), 39 percent of Chinook harvests, and 31 percent of coho harvests.

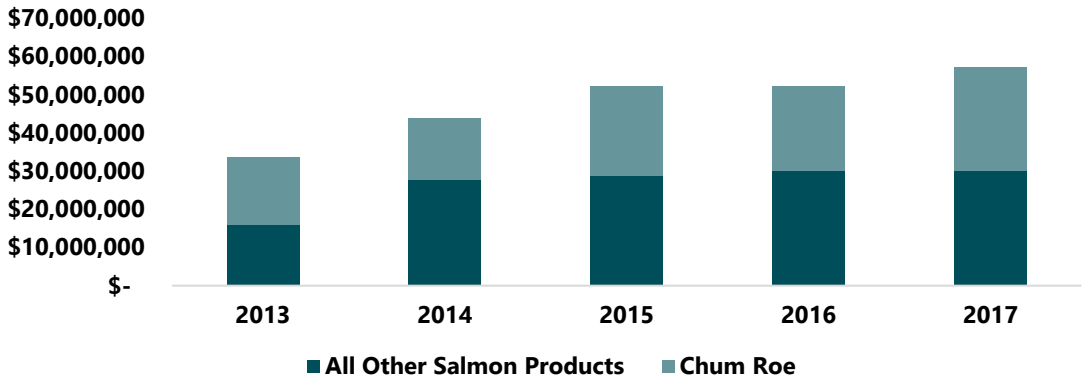
Seafood Processing

From 2013 to 2017, the cumulative wholesale value of SSRAA salmon was $239 million, including $49 million derived from sales of cost recovery salmon and $190 million from common property salmon. Annually, first wholesale value averaged $48 million during the study period.

By species, chum accounted for more than three-fourths (79 percent) of the wholesale value of SSRAA fish, followed by Chinook (14 percent) and coho (7 percent).

Chum roe is a major driver of the value of SSRAA production, typically representing just under half of SSRAA-generated wholesale value (see chart below).

First Wholesale Value of SSRAA Salmon, Chum Roe versus all other Products, 2013-2017



Sportfishing

Based on data provided by SSRAA, sport fishermen in SSE harvested 3,150 Chinook and 28,150 coho salmon, on average, in recent years. While chum are harvested by area sport fishermen, SSRAA's contributions to sport chum harvests are not tracked or estimated.

Southern Southeast Sport Harvest of SSRAA Salmon (number of fish), 2013-2017

	2013	2014	2015	2016	2017	2013 2017 Average
Chinook	2,080	1,750	4,612	2,732	4,691	3,150
Coho	19,970	50,567	38,798	9,742	21,607	28,150

SSRAA's contribution to the overall SSE sport harvest averaged 11 percent of Chinook and 20 percent of coho harvests from 2013-2016. In 2014 (the most recent year for which data is available), more than half (58 percent) of the region's Chinook and coho sport harvest was caught by guided anglers.

SSRAA's role in the sport sector is especially prominent in the Ketchikan area. ADF&G creel survey data indicates that roughly a third of the Chinook salmon caught in the Ketchikan area are typically SSRAA-produced fish, along with about 13 percent of the sport coho harvest. In May and June, Ketchikan's full-day and half-day charter fleet (primarily serving cruise visitors) is largely dependent on SSRAA Chinook returning to nearby release sites including Whitman Lake and Neets Bay.

SSRAA Operations

In 2017, SSRAA employed an average of 60 workers who earned a total of $3.3 million in wages. Additionally, the organization purchased supplies and services for its operations in Ketchikan (and at its various hatcheries and release sites) which contributed to the local economy. In state expenditures totaled $3.6 million for 2017.

Multiplier effects result from subsequent spending by SSRAA's employees and operational spending with vendors in the region. Including these multiplier effects, economic impacts resulting from SSRAA's operations totaled 80 jobs and $4.1 million in labor income in 2017.

Combined Economic Impact of SSRAA Production and Operations

SSRAA's total economic impact in 2017 is estimated at 680 jobs and $32 million in labor income, including impacts related to commercial fishing, seafood processing, nonresident sportfishing, and from SSRAA's own spending and employment.

Output is a measure of total economic activity, including all labor income, spending on supplies and services, and all related multiplier effects. Economic output associated with SSRAA and the salmon it produces totaled approximately $70 million in 2017.

Economic Impact of SSRAA Production and Operations, 2017

	Direct Impacts	Indirect & Induced Impacts	Total Economic Impacts
Commercial Fishing			
Employment	140	90	230
Labor Income	$10.1 million	$3.6 million	$13.7 million
Seafood Processing			
Employment	200	110	310
Labor Income	$7.4 million	$4.2 million	$11.6 million
Non-resident Sportfishing			
Employment	45	15	60
Labor Income	$1.6 million	$0.6 million	$2.2 million
SSRAA Operations			
Employment	60	20	80
Labor Income	$3.3 million	$0.8 million	$4.1 million
Total Economic Impact			
Employment	**445**	**235**	**680**
Labor Income ($millions)	**$22.4 million**	**$9.2 million**	**$32 million**
Economic Output (labor income, spending, and multiplier effects)			**$70 million**

Note: Totals may not sum due to rounding.
Source: McDowell Group estimates using IMPLAN, ADF&G, DOLWD, and SSRAA data.

Purpose and Methodology

Purpose and Scope

This study estimates and describes the economic impacts of the Southern Southeast Regional Aquaculture Association (SSRAA), with a focus on the five-year period from 2013 to 2017. This is an update of earlier economic impact reports produced by McDowell Group in 2001 and 2008. The report concentrates on five primary subjects:

1. ***Commercial Harvest*** – The overall economic benefits of commercially caught (common property) SSRAA salmon are presented using ex-vessel income – the gross value paid to fishermen for their catch. The geographic distribution of earnings from SSRAA salmon commercial harvest is also reported.

2. ***Seafood Processing*** – The overall economic impact resulting from processing SSRAA salmon (including common property and cost recovery harvests) is estimated using first wholesale value data from ADF&G. First wholesale value represents the first sale of fish by a processor to a buyer outside their affiliate network.

3. ***Sport Harvest*** – Contributions of SSRAA fish to the regional sport harvest are addressed, including impacts resulting from guided and unguided non-resident harvests.

4. ***Economic Impacts*** – This section summarizes the total economic impacts of SSRAA fish on the various sectors described above, along with the economic impacts resulting from SSRAA operations.

5. ***Tax Revenue*** –SSRAA fish support a variety of economic activities that are taxed, providing revenue to local governments throughout the SSE region.

For purposes of this report, Southern Southeast Alaska (SSE) is defined as the Ketchikan Gateway Borough, Prince of Wales (POW) Island-Hyder Census Area, City and Borough of Wrangell, and the Petersburg Borough. In terms of commercial fishing districts, SSE is defined as districts 1 through 8.

Methodology

The data used in this report comes from a variety of sources, including SSRAA, Alaska Commercial Fisheries Entry Commission (CFEC), Alaska Department of Fish and Game (ADF&G), Alaska Department of Labor and Workforce Development (DOLWD), and Alaska Department of Revenue (DOR). In addition, interviews were conducted with SSRAA staff, ADF&G employees, and other experts.

Estimates provided in this report are based on the best available data. SSRAA provided estimates of their contributions to common property, sport, and cost recovery fisheries in terms of number of fish. Average weights per fish and prices per pound were applied (based on ADF&G data for Southeast Alaska) to estimate the volume and value of SSRAA returns.

Several reports and other sources provided important sources of sportfishing data and related information, including the following:

- McDowell Group, 2010. *Impacts of Nonresident Sportfishing on the Ketchikan Economy.* Prepared for the Ketchikan Visitors Bureau.
- McDowell Group, 2008. *Economic Impacts of the Southern Southeast Regional Aquaculture Association.* Prepared for SSRAA.
- ADF&G, 2016. *Participation, Effort, and Harvest in the Sport Fish Business/Guide Licensing and Logbook Programs, 2014.* Fishery Data Series No. 16-02.
- Alaska Sport Fishing Survey database. 1996–2017. ADF&G, Division of Sport Fish (accessed May 2018): http://www.adfg.alaska.gov/sf/sportfishingsurvey/
- ADF&G, 2009. *An Evaluation of Estimates of Sport Fish Harvest from the Alaska Statewide Harvest Survey, 1996-2006.* Special Publication No. 09-12.

Economic Impact Modeling

McDowell Group developed an economic model to estimate the economic impacts related to SSRAA production and operations. The model linked ex-vessel volume and value data, DOWLD employment and payroll data, first wholesale value data, and other information to generate estimates of annual employment, income, and total economic output related to SSRAA salmon. Multipliers were drawn from IMPLAN, a widely used input-output model useful in measuring the direct, indirect, and induced economic impact of industry and infrastructure development. Along with experience from previous analyses, the study team used the model to estimate the economic impacts related to harvesting, processing, sportfishing, and to SSRAA operations in SSE.

In most cases, economic impact numbers presented in this report reflect 2013-2017 averages to smooth out year-to-year variations in salmon returns. The exception is impacts related to SSRAA's operations, which are based on 2017 data alone. For simplicity, total economic impacts are reported as representing 2017.

Introduction

The Southern Southeast Regional Aquaculture Association (SSRAA) is a non-profit corporation headquartered in Ketchikan, Alaska. Incorporated in 1976, the organization works to enhance the salmon stocks in Southern Southeast Alaska (SSE) from Dixon Entrance to Frederick Sound. SSRAA is guided by a 21-member Board of Directors representing a diverse group from the commercial, subsistence, sport, and fish processing sectors, as well as representatives from Native corporations, municipalities, the business community, and the general public. SSRAA employed an annual average of 61 staff in 2017 and a peak of 68 workers during the summer months.

SSRAA is primarily funded through a combination of revenues from a 3 percent ex-vessel tax on landed salmon within its operating area, and cost recovery of adult salmon returns. After nearly two decades running its own cost recovery program, SSRAA transitioned to a more typical royalty model starting in 2014. Among other smaller revenue sources, SSRAA also receives funding from ADF&G's Division of Sport Fish to provide releases of Chinook salmon for Ketchikan, Wrangell, and Petersburg area fisheries.

Facilities and Production

SSRAA operates seven hatcheries and seven additional remote release sites throughout SSE (see map on following page). SSRAA's longest-running hatcheries are located at Whitman Lake in Ketchikan; in Neets Bay, roughly 40 miles north of Ketchikan; Burnett Inlet, 25 miles south of Wrangell; and Crystal Lake, 20 miles south of Petersburg. These facilities raise Chinook, coho, and chum salmon for on-site releases, as well as for transfer to remote release sites in Kendrick Bay/McLean Arm, Nakat Inlet, Anita Bay, City Creek, and Neck Lake.

SSRRA has absorbed additional hatcheries and release sites run by other organizations in recent years. In 2014, SSRAA took over the Deer Mountain Hatchery in Ketchikan formerly run by the Ketchikan Tribal Hatchery Corporation. Chinook salmon reared at Deer Mountain are released at a remote Carroll Inlet release site and in Ketchikan Creek near downtown Ketchikan. In 2016, SSRAA took over operations of the Klawock River and Port Saint Nicholas hatcheries previously run by the Prince of Wales Hatchery Association (POWHA). POWHA's system included a release site at Port Asumcion that SSRAA now operates and is targeting for additional releases.

As shown in Table 1 below, Neets Bay accounts for 50 percent of all SSRAA releases, and the largest releases of chum, Chinook, and coho. After Neets Bay, the most important release sites are Kendrick Bay/McLean Arm, Anita Bay, Nakat Inlet, and Burnett Inlet. Other release sites account for less than 5 percent of total releases.

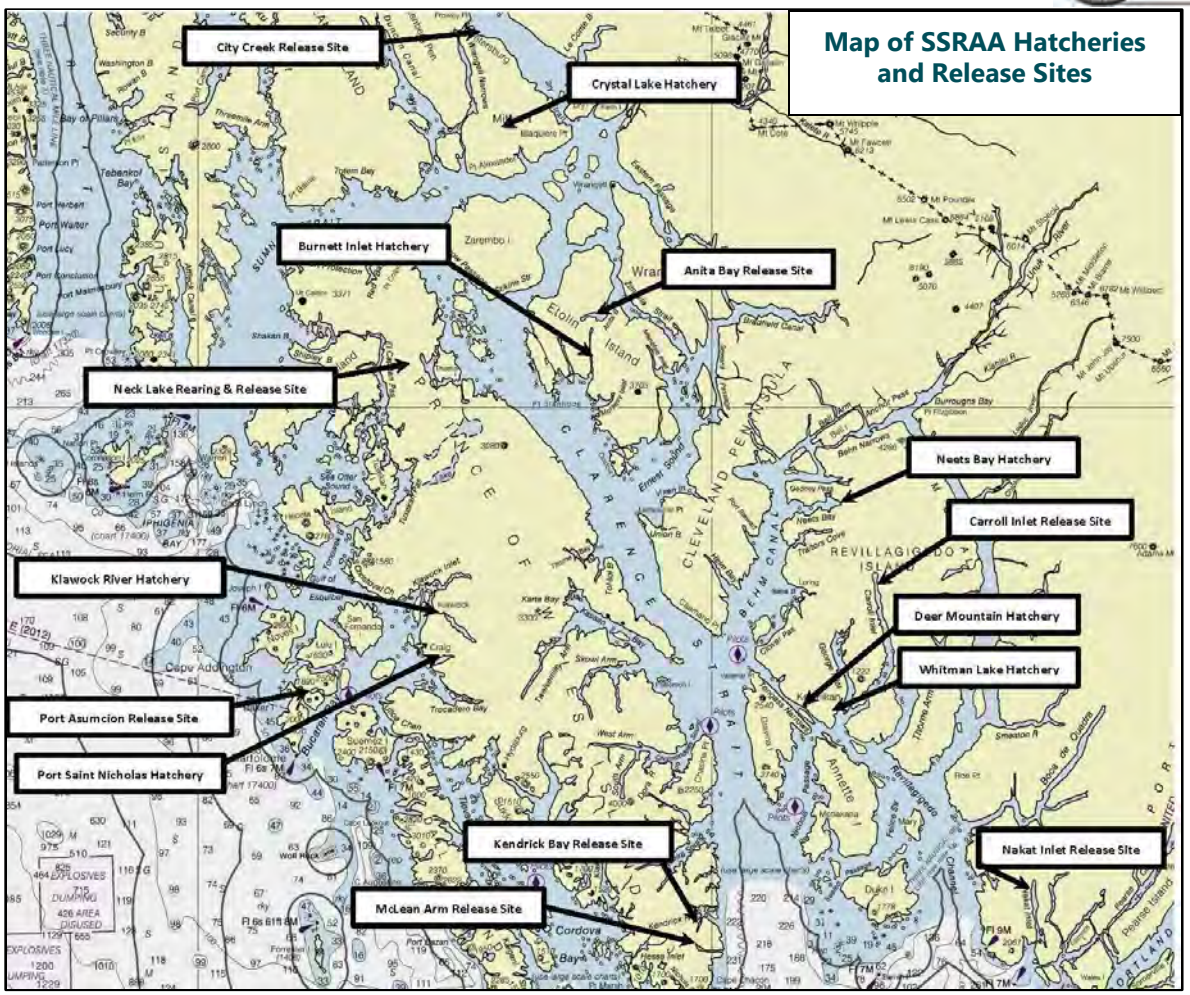


Table 1. Number of Smolts Released, by Release Site and Species, 2013-2017 Averages

Release Site	Chinook	Chum	Coho	Total	% of Total
Neets Bay	728,760	79,251,800	3,995,340	83,975,900	50%
Kendrick Bay/McLean Arm		29,300,800		29,300,800	17%
Anita Bay	454,460	22,263,600	504,300	23,222,360	14%
Nakat Inlet		14,336,600	525,000	14,861,600	9%
Burnett Inlet		9,690,000	185,420	9,875,420	6%
Klawock			4,480,000	4,480,000	3%
Neck Lake			1,763,600	1,763,600	1%
Whitman Lake	638,200		352,500	990,700	1%
Crystal Lake	635,830		131,820	767,650	0%
Carroll Inlet	365,000			365,000	0%
City Creek	98,000			98,000	0%
Deer Mountain	70,000			70,000	0%
Port St. Nicholas	89,000			89,000	0%
Total	**3,079,250**	**154,842,800**	**11,937,980**	**169,860,030**	

Source: SSRAA. Note: Releases from the Klawock and Port St. Nicholas hatcheries (new to SSRAA) reflect 2017 production. In addition, releases for newer programs from Deer Mountain/Carroll Inlet and City Creek reflect 2017 production.

Species Produced

Chum salmon constitute SSRAA's largest production effort and expected return. Chum fry are produced at the Whitman Lake, Burnett Inlet, and Neets Bay facilities. Chum are released on-site at the Neets Bay and Burnett Inlet hatcheries and at remote sites in Kendrick Bay/McLean Arm, Nakat Inlet, Anita Bay, and Port Asumcion (first release in 2018). Chum are primarily targeted by drift gillnet and purse seine fisheries in Clarence and Sumner Straits. A total of 169 million chum smolts were released by SSRRA in 2017.

Since 2013, SSRAA contributions to common property commercial chum harvests have ranged from 1.4 million fish in 2014 to 3.3 million fish in 2015, with a 2013-2017 average harvest of 2.1 million fish.

Coho salmon are produced primarily at the Whitman Lake hatchery, as well as at the Neets Bay and Klawock River hatcheries. In addition to hatchery releases, coho are released remotely from Anita Bay, Nakat Inlet, a large enhancement project at Neck Lake, and other sites. Coho are primarily targeted by trollers region-wide, and by drift gillnetters and sport fishermen in Sumner and Clarence Straits and the Ketchikan area. A total of 12.4 million coho smolts were released by SSRAA in 2017.

Recent commercial harvest of SSRAA coho has ranged from 190,000 fish in 2017 to 477,000 fish in 2014, with a 2013-2017 annual average of 304,600 fish.

Chinook salmon are mainly produced at SSRAA's Crystal Lake hatchery under contract with the ADF&G Sport Fish Division, as well as at the Whitman Lake, Neets Bay, and Port Saint Nicholas facilities. The fish are released on-site at the three facilities, from Neets Bay, and remotely from various sites. SSRAA Chinook are primarily targeted by troll and sport fleets near Ketchikan. A total of 2.9 million Chinook smolts were released in 2017.

Since 2013, SSRAA contributions to Chinook commercial harvests ranged from 22,700 fish in 2017 to 48,000 fish in 2015, with a 2013-2017 average harvest of 35,400.

SSRAA's **sockeye** salmon programs (primarily in support of restoration projects) have been phased out and the last SSRAA sockeye returns were seen in 2013 and 2014.

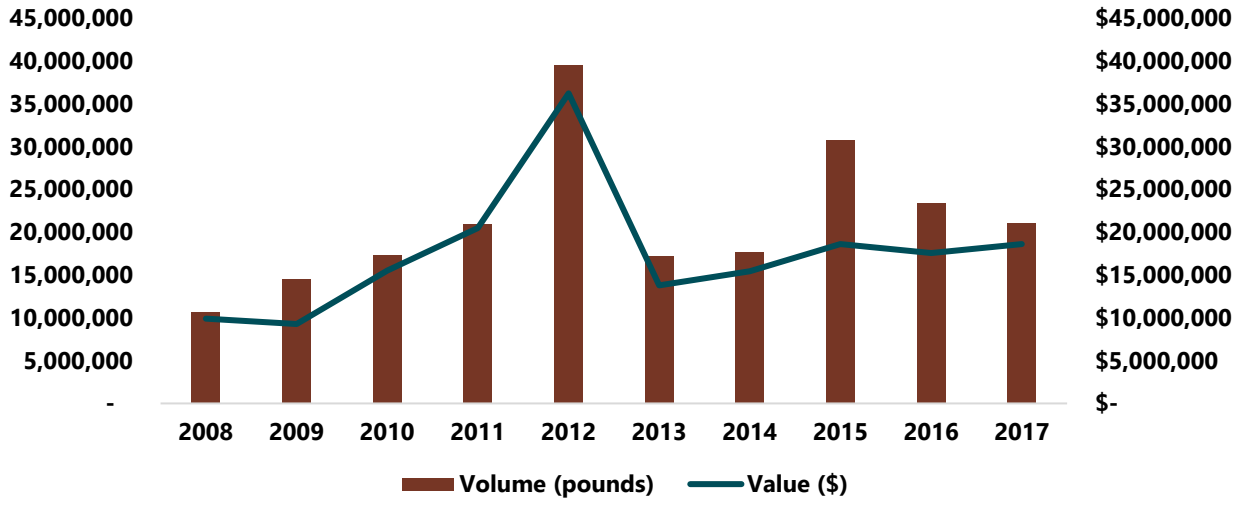
SSRAA Salmon in Commercial Fisheries

This section includes an overview of SSRAA's contributions to commercial salmon harvests in SSE, including harvest volume and harvest value. SSRAA-produced salmon that are caught outside of districts 1 through 8 are not included in these estimates. SSRAA fish are harvested outside of the SSRAA region, including other parts of Alaska and in British Columbia waters to the south, but not in sufficient numbers to warrant the additional sampling efforts that would be required to estimate SSRAA's contributions to harvests in these areas. The estimates presented below should be considered conservative.

Commercial Harvest of SSRAA Salmon

SSRAA-produced salmon contribute significantly to the commercial harvest of salmon in SSE. Since 2008, SSRAA contributed over 210 million pounds of salmon worth an ex-vessel value of $175 million to common property fisheries. During the record year of 2012, SSRAA contributed nearly 40 million pounds in ex-vessel volume.

Figure 1. SSRAA Salmon Harvest Volume and Value, Common Property Fisheries, 2008-2017



Source: McDowell Group estimates. Data from ADF&G and SSRAA.

Between 2013 and 2017, SSRAA contributed an average of 22 million pounds annually and a total of 110 million pounds of salmon to common property fisheries. On average, chum made up 89 percent of the volume during this five-year period, averaging 19.5 million pounds per year.

Table 2. SSRAA Salmon Common Property Harvest Volume (000s of pounds), 2013-2017

Species	2013	2014	2015	2016	2017	2013 2017 Average	2013 2017 Percent of Total
Chum	14,695	13,627	28,833	20,728	19,826	19,542	89%
Coho	2,044	3,530	1,379	2,343	993	2,058	9%
Chinook	527	550	567	330	280	451	2%
Total	**17,266**	**17,708**	**30,779**	**23,400**	**21,098**	**22,050**	

Source: McDowell Group estimates based on data from SSRAA and ADF&G.

The value of SSRAA salmon to the region's commercial fisheries has trended up over the last decade, due to higher prices – particularly for chum roe – and increased production and returns. Between 2013 and 2017, earnings of commercial fishermen attributable to SSRAA fish totaled $84 million for an annual average of $16.8 million. The high during this period was $18.6 million in 2015 and 2017 and the low was $13.8 million in 2013.

As mentioned previously, chum is the leading SSRAA-produced salmon. In 2017, chum salmon accounted for $15.9 million in ex-vessel value, followed by coho ($1.5 million), and Chinook ($1.2 million).

By gear type, SSRAA salmon harvest value is typically dominated by the seine fleet. During the 2013-2017 period, an estimated 46 percent of the value of commercially-harvested SSRAA fish went to seiners, 32 percent to gillnetters, and 21 percent to trollers.

Table 3. Commercial Ex-Vessel Value of SSRAA Salmon ($000s), 2013-2017

	2013	2014	2015	2016	2017	2013 2017 Average	2013 2017 Percent of Total
By Species							
Chum	8,971	8,917	15,940	13,010	15,887	12,545	75
Coho	3,025	4,714	1,135	3,360	1,547	2,756	16
Chinook	1,792	1,808	1,567	1,202	1,202	1,514	9
By Gear Type							
Purse Seine	5,498	5,859	10,206	8,567	8,886	7,803	46
Gillnet	4,703	5,367	6,176	5,089	5,882	5,443	32
Troll	3,604	4,215	2,260	3,917	3,868	3,573	21
Total	**13,805**	**15,441**	**18,641**	**17,572**	**18,636**	**16,819**	

Source: McDowell Group estimates based on data from SSRAA and ADF&G.
Note: 2013 and 2014 totals include a small amount of sockeye returns that are not specifically broken out. In addition, totals may not sum due to rounding.

SSRAA Harvest Value in Relation to Overall Southern Southeast Harvests

Over the last 10 years, SSRAA has contributed 19 percent of the volume and 28 percent of the value of SSE common property salmon harvests. SSRAA's relatively strong value role is attributed to the production focus on relatively low-volume, mid-value chum salmon, and on high-value Chinook and coho.

SSRAA's relative contribution is influenced by year to year variations in wild pink salmon abundance. Peak contributions – over 40 percent of the harvest value in 2017, for instance – occur in years with low pink salmon abundance. In years with near record pink salmon abundance, such as 2013, SSRAA contributed 13 percent of regional salmon harvest value.

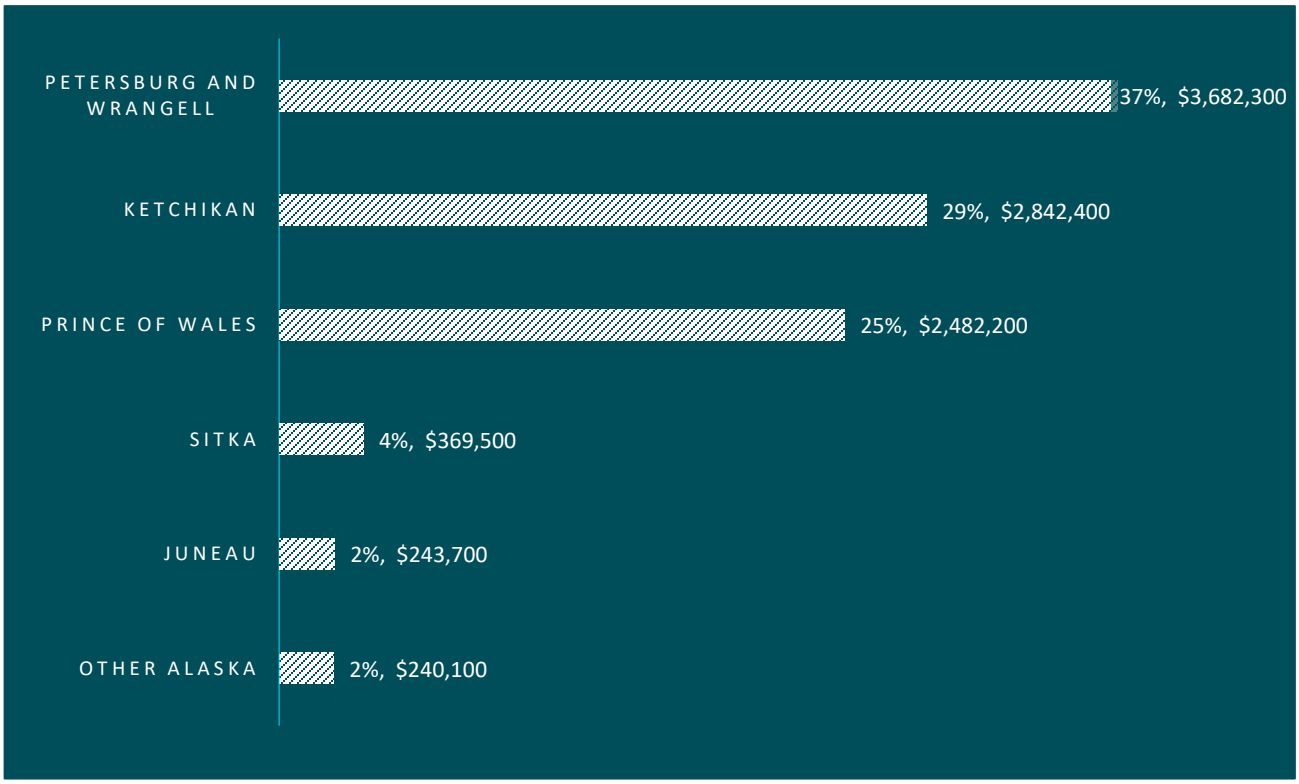
By gear group, SSRRA's relative contribution is greatest for the SSE gillnet and troll fleets (43 percent of harvest value from 2008 through 2017), followed by the seine fleet (20 percent). By species, SSRAA is responsible for over half of chum harvests (57 percent from 2008 through 2017), 39 percent of Chinook harvests, and 31 percent of coho harvests.

Geographic Distribution of Commercial Harvest Value

Among commercial fishermen, Alaska residents are the primary beneficiaries of SSRAA-produced salmon, earning three-fifths ($9.9 million) of the average annual ex-vessel value from 2013 through 2017.

Among Alaskans, ex-vessel benefits of SSRAA salmon are concentrated in SSE. Permit holders residing in the Petersburg-Wrangell area earned $3.7 million in ex-vessel value from SSRAA fish, accounting for 37 percentage of ex-vessel value to Alaska residents. They were followed by Ketchikan Gateway Borough residents, with 29 percent ($2.9 million); Prince of Wales residents at 25 percent ($2.5 million); Sitka area residents at 4 percent; and other Alaska residents, with approximately 4 percent of the total resident harvest value.

Figure 2. Geographic Distribution of SSRAA Ex-Vessel Value to Alaska Residents, 2013-2017 Average



Source: McDowell Group calculations based on data from CFEC and SSRAA. Note: Chart only shows income to Alaska residents.

SSRAA Salmon and the Processing Sector

The commercial harvest of SSRAA salmon generates significant benefits for Southeast Alaska's seafood processing industry, as indicated by its first wholesale value. First wholesale value is the most complete measure of economic activity associated with the salmon industry in Southeast Alaska. It is defined as the price received at sale of product by a processor to a buyer outside their affiliate network.

First wholesale value includes payments to commercial fishermen (ex-vessel value) and reflects the full spectrum of processor expenditures on goods and services associated with converting whole fish to a salable food product. This includes processing labor, local utilities, packaging and warehousing, and an array of support-sector activity associated with processing, such as tender vessel operations, expediting, maintenance and mechanical services, and processors' profit.

Estimates of the first wholesale value derived from SSRAA salmon in 2017 are based on preliminary data.

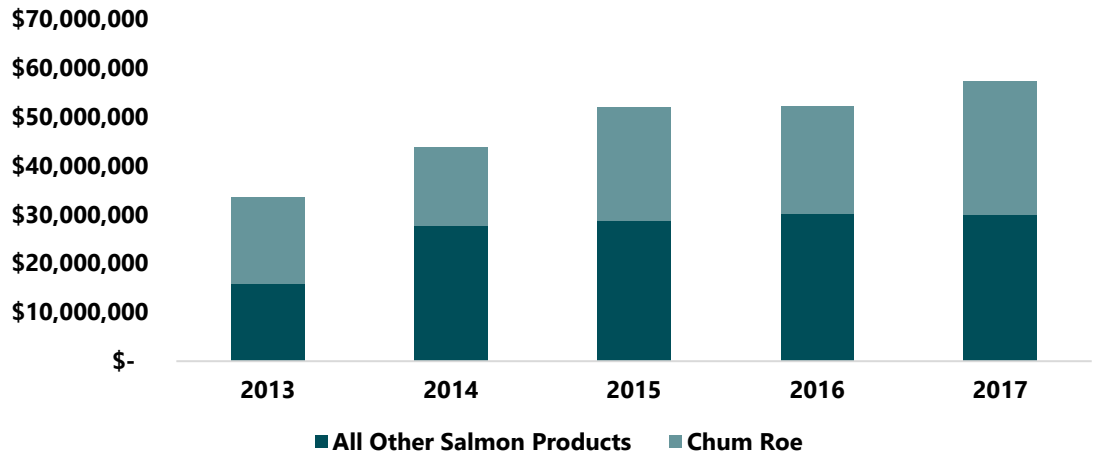
Role of SSRAA Fish in Seafood Processing Sector

A key benefit of SSRAA fish is providing stable chum returns to processors to balance out volatility in other species, especially pink salmon. Together, chum and pink salmon account for over half of the first wholesale value of all seafood species caught and processed in Southeast Alaska (which species is most important varies from year to year). While wild-stock pink salmon returns fluctuate significantly from year to year, hatchery-bred chum salmon provide a stable source of income for processors and harvesters.

From 2013 to 2017, the cumulative wholesale value of SSRAA salmon was $239 million, including $49 million derived from sales of cost recovery salmon and $190 million from common property salmon. Annually, first wholesale value averaged $48 million during the study period. By species, chum accounted for more than three-fourths (79 percent) of the wholesale value of SSRAA fish, followed by Chinook (14 percent), and coho (7 percent).

Less the cost of fish, processors earned an estimated gross margin of $134 million on SSRAA fish during the five-year study period. This amount reflects the total value added to SSRAA salmon by regional seafood processors.

Figure 3. First Wholesale Value of SSRAA Salmon, Chum Roe versus all other Products, 2013-2017



Source: McDowell Group estimates based on data from SSRAA, ADF&G, and DOR.

As evidenced by the data in Figure 3, chum roe is a major driver of the value of SSRAA production. Chum roe products represented close to half (45 percent) of the SSRAA-generated wholesale value between 2013 and 2017. More information on market trends for chum roe and other key products is provided in the last section of this report.

SSRAA Salmon in Sport Fisheries

In addition to SSRAA's importance to SSE commercial fisheries, sport harvest of SSRAA salmon has a significant impact on the region's economy. Resident anglers who target SSRAA fish spend money on boats, fishing gear, fuel, and supplies, while non-resident anglers often hire local charter fishing companies that source many supplies locally and provide jobs to local residents.

Based on data provided by SSRAA, sport fishermen harvested an estimated 15,865 Chinook and 140,684 coho salmon produced by the aquaculture association between 2013 and 2017. The average annual Chinook and coho harvest was approximately 3,150 and 28,150 fish, respectively, during this time period.

Table 4. Southern Southeast Sport Harvest of SSRAA Salmon (number of fish), by Species, 2013-2017

	2013	2014	2015	2016	2017	2013 2017 Average
Chinook	2,080	1,750	4,612	2,732	4,691	3,150
Coho	19,970	50,567	38,798	9,742	21,607	28,150

Source: SSRAA estimates. Note: Averages rounded to the nearest 50.

Data from ADF&G's annual Statewide Harvest Survey for areas A (Ketchikan), B (POW), and C (Petersburg/ Wrangell/Kake) indicate overall catches in the region averaged 28,300 Chinook and 144,200 coho annually from 2013-2016. Data for 2017 was not available at the time of this report.

Table 5. Total Chinook and Coho Salmon Sportfish Harvest by Statewide Harvest Survey Area, 2013-2016 Averages

Area	Chinook	Coho
Ketchikan (A)	10,200	50,850
Prince of Wales Island (B)	12,900	80,100
Petersburg, Wrangell & Kake (C)	5,200	13,250
Southern Southeast (A, B & C)	28,300	144,200

Source: ADF&G 2014 Statewide Harvest Survey.

SSRAA's contribution to the overall SSE sport harvest averaged 11 percent of Chinook and 20 percent of coho harvests, based on 2013-2016 data. As shown in Table 6, there is substantial variation year to year.

Table 6. SSRAA Salmon, as a Percent of Total Southern Southeast Sport Harvest, 2013-2016

	2013	2014	2015	2016	2013 2016 Average
Chinook	9	5	15	10	11
Coho	12	33	25	10	20

Source: ADF&G and SSRAA.

SSRAA's role in the sportfishing sector is especially prominent in the Ketchikan area. ADF&G's creel survey data indicates that roughly a third of the Chinook salmon caught in the Ketchikan area are typically SSRAA-produced fish, along with about 13 percent of the sport coho harvest.[1]

Similar data for the Petersburg/Wrangell/Kake area indicate roughly a quarter and a tenth of the sport harvest of Chinook and coho, respectively, near those communities was SSRAA fish. For the west coast of Prince of Wales Island (POW), creel data indicates roughly 2 to 5 percent of Chinook and coho harvests were SSRAA fish. These numbers were provided by ADF&G staff but are not regularly published and are presented as reference points to understand the relative importance of SSRAA fish in sport harvests throughout the region.[2]

Charter Fleet Harvest of SSRAA Salmon

ADF&G charter vessel logbook data indicates that approximately 324 charter vessels offloaded in SSE ports in 2014 (the most recent data available). Of these, 146 offloaded in the Ketchikan area, 145 in POW ports, 26 in Petersburg, and 7 in Wrangell.[3] Vessels may operate out of multiple ports, and totals reflect an unknown, but likely minor, amount of double counting.

Table 7. Southern Southeast Charter Vessels, by Port of Offloading, 2014

SWHS Area	Port of Offloading	# of Vessels
A	Ketchikan	146
B	Prince of Wales Island	145
C	Petersburg	26
C	Wrangell	7
Total SSE		**324**

Source: ADF&G Saltwater Log Books, 2014 Note: Total may include some double counting.

Combined, charter vessels in SSE completed a total of 14,994 trips and supported 59,680 angler-days in 2014. Over 96 percent of angler days reflect non-residents. These fishermen harvested over 18,000 Chinook and 88,000 coho in 2014, representing 57 and 58 percent respectively, of the overall SSE sport harvest of these species that year.

The primary impact of SSRAA salmon for the Ketchikan charter industry occurs in the early Chinook season (May and June) and during the late coho run (late August through September). In May and June, the full-day and half-day charter fleet (primarily serving cruise visitors) is largely dependent on SSRAA Chinook returning to nearby release sites including Whitman Lake and Neets Bay. This is especially true in Summer 2018 due to low wild Chinook returns.

[1] The ADFG creel survey is based on a stratified random sampling at fishery landing locations. Not all times of day and landing locations are sampled each day. Surveys end in mid-September.
[2] Personal communication with Mike Jaenicke, ADF&G.
[3] ADF&G, 2016. *Participation, Effort, and Harvest in the Sport Fish Business/Guide Licensing and Logbook Programs, 2014.* Fishery Data Series No. 16-02.

Economic Impacts of SSRAA Production and Operations

SSRAA has a wide array of economic impacts in Southeast Alaska through its contributions to commercial fishing, seafood processing, sportfishing, and its own operations. Commercial fishermen earn income from the harvest of SSRAA-produced fish and purchase fuel, food, gear, and many other supplies in support of their fishing efforts. Seafood processing companies employ hundreds of workers and purchase goods and services as they add value to SSRAA salmon. SSRAA operations directly generate additional economic impacts through wages for its own employees and through purchases of goods and services in Ketchikan and other SSE communities. This spending cycles through the regional and local economies, creating indirect and induced economic "multiplier" effects.

As described in more detail below, SSRAA's 2017 production and operations spurred economic output in Southeast Alaska totaling $65 million, an economic footprint that included 640 jobs and $30 million in labor income, including all multiplier effects. Specific contributions from commercial fishing, seafood processing, sportfishing, and SSRAA operations are outlined in this chapter.

Commercial Fishing Economic Impacts

Over the 2013 to 2017 period, commercial fishermen harvested SSRAA salmon with an annual average ex-vessel value of $16.8 million. A portion of this total ex-vessel value becomes pay for permit holders and crew, with the rest spent on the goods and services necessary to conduct commercial fishing operations. Both of these components of ex-vessel value fuel economic activity in the region's support sector.

Commercial fishing-related labor income: Based on McDowell Group estimates, about 50 to 60 percent (depending on gear type) of commercial salmon fishing ex-vessel value becomes labor income or net pay for permit holders and crew. Based on these and other estimates, SSRAA-related labor income earned by skippers and crew averaged $10.1 million over the 2013 to 2017 period.

As commercial fishermen spend their income in support of their households, "induced" employment and wages are generated.

Additional employment and labor income is created in the region as fishermen make purchases in support of their fishing business. An estimated $3.8 million in in-region purchases are made annually in support of commercial fishing targeting SSRAA salmon, assuming roughly 60 percent of spending is in-region. Jobs and wages created by this spending are termed "indirect" economic impacts. This estimate factors in non-resident participation in the commercial harvest of SSRAA salmon.

McDowell Group modeling of indirect and induced effects indicates that commercial fishing for SSRAA salmon produced $13.7 million in labor income, including direct, indirect, and induced impacts. This includes commercial fishing income earned in Southeast Alaska, and related multiplier effects in the regional economy.

Commercial fishing related employment: Measuring commercial salmon fishing employment in terms of full-time equivalents or monthly averages is difficult due to the highly seasonal nature of the fishery. However, it is useful to do so to provide a measure of relative importance. While several hundred skippers and crew harvest SSRAA-produced salmon, a measure of annual average equivalency places employment at 140 jobs. As described above, spending by fishermen in support of their fishing activity and households has multiplier effects, creating additional jobs and income. Including those multiplier effects, commercial harvest of SSRAA salmon accounted for an average of 230 jobs (including 140 direct jobs and 90 support sector jobs).

Table 8. Economic Impact of Commercial Harvest of SSRAA-Produced Salmon

	Direct	Indirect/Induced	Total
Employment	140	90	230
Labor Income	$10.1 million	$3.6 million	$13.7 million

Source: McDowell Group estimates

Seafood Processing Economic Impacts

Over the 2013 to 2017 period, the total first wholesale value of all SSRAA salmon averaged $47.9 million, including the value of cost recovery production. Components of that total value include $24.6 million in payments to fishermen for their catch and payments to SSRAA for cost recovery fish, an estimated $7.4 million in wages paid to processing employees, and $5.6 million in local purchases of goods and services in support of processing operations.

Direct employment related to processing of SSRAA salmon is estimated at 200 jobs in the SSE region. This is an annualized figure. The number of individual workers who earn some income from processing SSRAA salmon is much higher. Processing employment data for Ketchikan illustrates the relationship between annualized employment and peak employment. In 2016, for example, seafood processing accounted for 341 jobs in Ketchikan, averaged over all 12 months of the year. Peak employment (in August) totaled 968 jobs.

Similar to commercial fishing, there are indirect and induced (multiplier) effects associated with processor spending and employee spending in the local economy. The analysis of multiplier effects requires adjustments for non-resident participation in the seafood processing workforce. Non-resident workers spend less in the local economy than their resident co-workers and therefore have a lower multiplier impact. In the SSE region, non-residents account for about 70 percent of the jobs and 65 percent of the wages in seafood processing.

Based on McDowell Group modeling, a total of 310 jobs and $11.6 million in annual labor income are linked to processing of SSRAA salmon, including all direct, indirect, and induced effects.

Table 9. Economic Impact of Processing of SSRAA-Produced Salmon

	Direct	Indirect/Induced	Total
Employment	200	110	310
Labor Income	$7.4 million	$4.2 million	$11.6 million

Source: McDowell Group estimates

Sportfishing Economic Impacts

Sport fish harvests of SSRAA Chinook and coho salmon also contribute significantly to the SSE economy. Direct economic impacts from the SSRAA sport fishery include non-resident spending in the region on guided fishing tours, boat rentals, fishing gear, bait, food, lodging, and transportation. Economic impacts resulting from resident sportfishing is not quantified for this report, as discussed in more detail below.

Based on the findings of previous McDowell Group studies and data from ADF&G and SSRAA, the study team estimated annual non-resident spending on sportfishing in the SSE region. SSRAA's percentage of the sport harvest, along with other data, was used to translate overall spending to spending attributable to SSRAA-produced salmon – estimated at $3.3 million in 2014. That figure, adjusted for inflation, is assumed to be a reasonable estimate for 2017.

In 2017, the regional economic impact of non-resident sport harvest of SSRAA salmon included 60 annual equivalent jobs and $2.2 million in labor income, including all direct and multiplier effects.

Resident sportfishing has a significant impact on the region's economy. Millions of dollars are spent each year on boats, fishing gear, fuel, bait, tackle, repairs and maintenance services, and harbor and ramp fees. Unfortunately, no reliable data is available on resident spending on sportfishing and an analysis of impacts resulting from resident sportfishing is outside the scope of this project.

Economic Impacts of SSRAA Operations

In 2017, SSRAA employed an average of 60 workers who earned a total of $3.3 million in wages. Additionally, the organization purchased supplies and services for its operations in Ketchikan (and its various hatcheries and release sites) which contributed to the regional economy. In state expenditures totaled $3.6 million for 2017. The indirect and induced economic impact of employee spending and SSRAA spending on supplies and services is estimated at 20 jobs and $800,000 in labor income. Based on those estimates, SSRAA operations impact totaled 81 jobs and $4.1 million in labor income, including direct, indirect, and induced impacts.

Table 10. Economic Impact of SSRAA Operations

	Direct	Indirect/Induced	Total
Employment	60	20	80
Labor Income	$3.3 million	$0.8 million	$4.1 million

Source: McDowell Group estimates

Summary of Economic Impacts

The total economic impact of SSRAA, including jobs and income related to commercial fishing, seafood processing, non-resident sportfishing, and from SSRAA's own spending and employment, is estimated at 680 jobs and $32 million in labor income.

Table 11. Economic Impact of SSRAA, Including Direct, Indirect, and Induced Impacts, 2017

	Commercial Fishing	Seafood Processing	Nonresident Sportfishing	SSRAA Operations	Total Impacts
Employment	230	310	60	80	680
Labor Income	$13.7 million	$11.6 million	$2.2 million	$4.1 million	$32 million

Source: McDowell Group estimates

Output is a measure of total economic activity, including all labor income, spending on supplies and services, and all related multiplier effects. Economic output associated with SSRAA and the salmon it produces totaled approximately $70 million in 2017.

Realized and Expected Production Increases

The economic impact analysis presented in this report is based on average SSRAA salmon returns (and resulting harvest volumes and values) over the 2013 to 2017 period. These returns are the result of releases three to six years earlier, depending on the species.

SSRAA has seen increased releases in the last few years due to increased chum production and the incorporation of the Klawock River Hatchery previously operated by the Prince of Wales Hatchery Association. These recent additional releases have not yet translated into increased harvests and are not reflected in the ex-vessel value and first wholesale value numbers presented in this report. (On the other hand, the operating expenses associated with running these additional programs *are* included in the economic impact calculations in this report, as the SSRAA operations analysis is based on 2017 financial statements and vendor data.)

In addition to recent increases, additional production has been planned and permitted and can be expected to be realized by 2020. Compared to the production years that resulted in the 2017 harvests, the following increases are expected by 2020:[4]

- 30 percent increase in summer chum production
- 16 percent increase in fall chum production
- 45 percent increase in fall coho production
- 12 percent increase in Chinook production.

[4] Based on data provided by SSRAA.

To put these increases in perspective, summer chum is anticipated to constitute 79 percent of total releases in 2020, followed by fall chum (14 percent), fall coho (4 percent), summer coho (1 percent), and Chinook (1 percent).

Translating increased production into increased economic impacts is challenging due a variety of factors. A point of reference can be calculated based on assuming a conservative 25 percent increase in overall releases and a similar increase in average ex-vessel volumes and values by 2025. A roughly 25 percent increase over 2013-2017 averages would result in ex-vessel values to commercial fishermen of $21 million by 2025 (an additional $4.2 million). The economic output resulting from these additional increases would likely not increase at the same rate, but an increase of 20 percent would bring the total economic output associated with SSRAA to $84 million.

Tax Revenue Associated with SSRAA Salmon

Fisheries Business Tax

All salmon commercially harvested and processed in Southeast Alaska, including SSRAA-produced common property and cost recovery fish, are subject to a 3 percent Fisheries Business Tax paid by commercial seafood processors. Revenue from the Fisheries Business Tax is shared equally between the State of Alaska and the city or borough where the fish were landed.

From 2013 through 2017, the estimated Fisheries Business tax receipts derived from SSRAA salmon totaled $3 million, with an annual average of $507,000. Half of these receipts are shared with local governments where the fish was landed. In SSE, most of the local government revenue impacts of the Fisheries Business Tax will be felt in Ketchikan, Wrangell, and Petersburg due to the location of major salmon processing plants.

Local Taxes

Regional spending resulting from SSRAA production and operations also leads to substantial tax revenue to local governments, including sales, property, and bed tax revenue. These revenues occur as a result of spending in all sectors directly and indirectly impacted by SSRAA. Estimating these local tax impacts is beyond the scope of this study.

Chum Market Trends

Market trends have significant implications for SSRAA and the commercial fleet harvesting SSRAA-sourced fish. Changes to the value of chum are particularly relevant as the species is the primary focus of the hatchery association and the species usually accounts for about 80 percent of the average first wholesale value of products made with SSRAA salmon.

Southeast Alaska chum salmon prices to fishermen averaged $0.74 per pound from 2008 through 2017 – more than double the average over the preceding decade. Prices peaked at close to a dollar per pound in 2011, after which they dropped to $0.59 a pound in 2015 and then rebounded to $0.86 by 2017. Preliminary 2018 prices appear to be comparable or higher than 2017.

Roe value is a key driver of chum prices, generally contributing close to 50 percent or more of the total wholesale value of the species to processors. Prices reported to DOR and published in the department's Alaska Salmon Price Reports include all types of chum roe combined. Based on this dataset, chum roe prices in Southeast Alaska peaked at over $20 a pound in Fall 2012. More recently, chum roe has been selling at wholesale prices in the $15 to $17 range.

Prices paid to Southeast Alaska processors for frozen headed and gutted (H&G) chum have also risen steadily – from around $0.59 in 2004 to $1.69 in 2017. Similar to chum roe, frozen H&G prices peaked in 2012 at $2.01 a pound.

After frozen H&G and roe products – which each provide comparable total revenues to Southeast processors – the next most import product form is frozen fillets. In 2015 (the year with the most complete data), frozen fillets made up 7 percent of total chum product sales reported by Southeast processors. Prices reported for frozen fillets followed similar trends to other chum products, with a 2017 price of $3.55.

Prices in 2018 are expected to be favorable due to lower than average production in Japan (a leading chum producer), relatively high farmed salmon prices, and lower run forecasts for 2018.

Coho Market Trends

Average Southeast Alaska coho salmon prices to fishermen rose above $1 a pound starting in 2006, only dropping below that milestone in one subsequent year (2015 saw an average price of $0.91 a pound). Over the last ten years, the ex-vessel price averaged $1.34 a pound and has been as high as $1.64 (2008). In 2017, Southeast Alaska fishermen received an average price of $1.55 a pound, the second highest on record.

First wholesale prices also hit near record highs in 2017, continuing a steady trend of increasing prices. Frozen H&G coho prices hit $3.45 a pound in 2017, the second highest on record (2013 saw prices of $3.60 a pound).

Frozen Southeast Alaska coho fillets went for as much as $6.39 a pound last year, also the second highest on record and up from $3.58 in 2004.

Based on production data reported to the Alaska Department of Revenue (Alaska Salmon Price Reports), frozen H&G products made up 44 percent of revenue from coho salmon, followed by frozen fillets (27 percent), and fresh H&G (24 percent). Roe made up only 4 percent.

Chinook Market Trends

Chinook salmon ex-vessel prices to Southeast Alaska fishermen have climbed steadily over the last decade. Previously averaging around $2 a pound (from 1984 through 2007), the last decade saw average ex-vessel prices of $4.82. In 2017 – a year with low harvest volumes – fishermen received an all-time high of $7.44 a pound. Due to strong demand and limited supply, preliminary 2018 ex-vessel prices are even higher than 2017.

Wholesale prices also hit peaks in 2017. Frozen filet prices averaged $14.94 a pound in 2017, up from $11.73 the previous year and $8.45 in 2015. Fresh H&G Chinook prices averaged $9.70 a pound in 2017, up 50 percent over 2016 prices and 25 percent over 2008. Roughly half of Chinook wholesale value derives from sales of frozen fillets (49 percent in 2017), followed by fresh H&G (28 percent), and frozen H&G (22 percent).

Submitted By
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Submitted On
10/3/2018 3:25:50 PM
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I ask that the Board reject ACR 1, and ACR2 because they fail to meet the criteria for review as emergency matters. This is the finding of the assessment done by ADF&G. The authors of these proposals should be reminded to bring these subjects to the Board of Fish in it's normal cycle.

I am a commercial fisherman operating a seine boat in Prince William Sound. My fishing business depends substantially on hatchery fish. I believe it is fair to say that without hatchery fish there would not be a seine fishery for salmon in PWS. Concerns about the straying of hatchery salmon are not without merit. In Prince William Sound there is research being conducted in a scope greater than has ever been before. The results of this study should be helpful in consideration of proposals such as these in the future.

Submitted By
Thomas Nelson
Submitted On
9/24/2018 10:54:35 AM
Affiliation

Member of the Board of Fisheries, I am writing to express my strong OPPOSITION to ACR 1 and ACR 2 regarding limiting hatchery production. I am a PWS salmon seine permit holder and the hatchery programs around the state are a vital component to salmon fisheries and processors. The justification for these ACR's are pure propoganda with NO legitimate science supporting them. All data submitted is purely hypothetical and extemely biased. Papers and research designed to produce a specific result to serve a specific purpose while ignoring or omitting any data or suppositions that would be counter to their purpose. An example would be the characterization of pink salmon as a horde of predators overwhelming the food supply, pink salmon represent a micro % of YOY fish in the ocean. You couldnt even represent the amount of pink salmon in the gulf versus other fish in a pie chart, the graphic would be so small you couldnt see it with the naked eye, yet proponents asert they are responsible for the demise of any species suffering a downtrend. Pure propoganda and pure politics. These ACR's are in no way a emergency and have no place being taken up out of cycle. Thank you Tom Nelson

Submitted By
Timothy J Moore
Submitted On
10/3/2018 3:00:19 PM
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Alaska Board of Fisheries

John Jensen, Chair

Via email: dfg.bof.comments@alaska.gov

Dear Chairman Jensen,

My name is Timothy Moore and I reside in Homer, Alaska. My family and I have sport and commercially fished in Alaska as a resident since 1984. I have sport and commercially fished in many areas around the State and presently salmon seine in Prince William Sound (PWS) providing my family's livelihood. I have attended and participated in Board of Fish meetings since the late 1980's. I am presently serving as Chairman of the Prince William Sound Aquaculture (PWSAC) Board. I also serve on the PWS/CR regional planning team as a PWSAC representative.

The following comments will be in response to ACR #1 and ACR#2 being discussed in the Board Work-session in Anchorage on October 15 and 16.

ACR 1 Prohibit Valdez Fisheries Development Association from incubating, rearing, and releasing pink salmon resulting from additional egg take capacity permitted in 2018 and cap egg take capacity at the level permitted in 2017 (5 AAC 24.366).

In essence, this ACR request duplicates the emergency petition requested by the same group and taken up this summer by the BOF. This is a redundant effort to revisit a perceived problem that has already been rejected as unwarranted. The BOF has received much information showing ADF&G's due diligence to evaluate and manage approved hatchery production plans. Potential production changes must go through ADFG's scientists' evaluations, be approved by the Regional Planning Teams with public comment and then finally pass approval by the ADF&G Commissioner. I respectfully, reference **5AAC 39.999. Policy for changing Board Agenda** and **RC2** staff comment recommendations to the BOF on this matter. Department comments indicate that this ACR does not meet criteria needed to place this on this winter's BOF meeting schedule. Currently, the scientists charged with managing the State Hatcheries are saying there are no conservation concerns or compelling reasons to accept this ACR. Additionally, considerable in-depth hatchery management information will be provided to the BOF at its October work session. The Prince William Sound regular cycled meeting occurred this past winter and there is no justification for the BOF to consider these unmerited ACR's out of the regular meeting cycle.

ACR 2 Cap statewide private non-profit salmon hatchery egg take capacity at 75% of the level permitted in 2000 (5 AAC 40.XXX).

This ACR request asks to dramatically decrease production of the Alaska salmon hatchery program which has been the work of many years of prudent cooperative management processes between the State's scientific management resources, Regional Hatchery Associations and all stakeholders. Again, I respectfully cite **RC2** which indicates that the ADFG staff reports state that ACR 2 does not meet any of the criteria required to be considered out of the regular cycle.

Furthermore, if the hatchery production decrease requested by ACR 2 were to be enacted it would cause great harm to the State's available salmon resources and decrease salmon abundance which would affect many salmon stakeholders negatively.

The Department of Fish and Game needs to remain true to its mission "To protect, maintain, and improve the fish, game, and aquatic plant resources of the state, and manage their use and development in the best interest of the economy and the well-being of the people of the state, consistent with the sustained yield principle." As a participant in this great process I see an overwhelming success story that has resulted in record breaking wild and enhanced salmon returns to Prince William Sound in recent years. ADFG management to sustain

wild salmon populations while managing hatchery salmon has been successful. Through projects like the Alaska Hatchery-Wild Interaction Study we will continue to gather valuable information to facilitate sound scientific-based management decisions. I would contend that ACR 1 and ACR 2 being considered by the BOF are reactionary, political and ill-founded on poor science and emotion.

For these justifications I respectfully ask the BOF to reject these ACR requests.

Submitted by

Timothy J. Moore

PO Box 1646

Homer, AK. 99603

Submitted By
Timothy J Moore
Submitted On
10/3/2018 3:13:23 PM
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PO Box 1646
Homer, Alaska 99603-1646

Re: Joint Protocol on Salmon Enhancement #2002-FB-215 – Prohibitions

Dear Chairman Jensen and Board of Fish Members:

I respectfully submit additional comments opposing ACR 1 and ACR 2 based on the board's Joint Protocol on Salmon Enhancement #2002-FB-215. It states as follows in the Protocol subheading of the document, first paragraph, and fourth sentence:

"....These salmon enhancement meetings will not be open for regulatory actions and no hatchery-related petitions or agenda change requests (ACRs) will be considered as action items."

Submitted by Timothy J Moore

Submitted By
Tom Manos
Submitted On
10/3/2018 4:51:51 PM
Affiliation
Fisherman

Phone
907 830 5150
Email
manostom@gmail.com
Address
PO Box 749
Girdwood, Alaska 99587

Mr Chairman and Board of Fisheries Members

I encourage the Board to not take action that would reduce hatchery production .

I share a concern regarding the effect of hatchery production and ocean carrying capacity and I support the current work ADF&G to try and understand this issue. The hatcheries in Alaska are an important contribution for all fishers in the state and I believe this is more of an effort to eliminate commercial fishermen than to address what may be a global concern. This is not an Alaskan friendly motion and is largely funded by out of state money in the misguided perception that it will provide anglers more opprotunity.

I support and encourage the State of Alaska to continue to use the best science available to make these important decisions .

Tom Manos

Submitted By
Tom Meiners
Submitted On
10/3/2018 7:03:02 PM
Affiliation

Phone
7202532393
Email
thomasm.meiners@gmail.com
Address
805 Goldbelt Ave
Juneau, Alaska 9801

Chairmen Jensen and Members of the Board,

I would like to state my strong opposition to ACR 1, 2, and 10.

ACR 1 by the Kenai River Sport Fish Association to deny VFDA its previously permitted release of pink salmon, forcing VFDA to terminate live fish that have already been permitted for release. The permit process through the Dept of Fish and Game for new hatchery production is extensive, public, and overseen by the department. Allowing KRSA the ACR would circumvent and weaken that public process.

Furthermore, the 'threat to wild salmon' KRSA claims this release poses is imagined. Contrary to statements made by the petitioner, this release will have an immeasurably small effect on the carrying capacity of the pacific ocean for salmon and other species. Straying of pink salmon, both hatchery and wild, is a naturally occurring phenomenon and has not been proven to endanger the wild stock runs in neighboring systems. The straying rates quoted by the petitioner were produced without following proper sampling guidelines and are exaggerated. There is a multi year scientific study underway in PWS to study this naturally occurring phenomenon with the hopes of answering some of the questions that still remain about how hatchery and wild salmon interact. There is no imminent threat posed by VFDA's proposed pink salmon release, and therefore no action is necessary by the board. This ACR is simply an attack by a sport fishing group with an anti commercial fishing agenda on hatchery production and by extension on commercial salmon fishing and salmon fishermen.

ACR 2

ACR 2 is an attempt to put commercial fishermen across the state out of business, period. Speaking as a young SE seiner who recently entered the business, hatchery salmon are imperative to the success of new fishermen in every gear group in my region. Without hatchery fish, the boom and bust reality of mother nature's amazing wild stock runs would put fishermen and processors out of business. Hatcheries remove a small amount of the uncertainty and wrath that mother nature can bring onto our wild stock runs by allowing humans to oversee salmon at their most vulnerable and fragile moments of development. Hatchery returns, like all salmon, are still a gamble, but the hatchery process evens the spread between the booms and massive busts of purely wild fisheries and allow fishermen a surer to keep their business moving when wild runs fail due to any number of natural or unnatural issues.

While hatchery production is imperative to the success of commercial fishermen, it is not just commercial fishermen who benefit from hatcheries. Hatcheries provide strong jobs and exciting careers in hands on hard science for local residence, provide fish to the plant for shore based processing facilities in coastal communities, create sport opportunities for local residence, and provide educational opportunities for school children and tourists alike. In times like these, when wild stock king salmon stocks are not doing well, hatcheries maintain sport opportunities for local residents by releasing kings and cohos.

ACR 10

The board of fisheries heard extensively on this subject during the last board of fish cycle in January of this year. The Alaska Dept of Fish and Game has many safeguards in place to prevent the overharvest of herring and to protect the resource in times of low abundance. I support ADF&G's current management practices in the Sitka Sac Roe fishery, and feel that this ACR simply attempting to rehash the same conversations the board recently ruled on, with no new information present. I support strong science based management of the Sitka sac roe fishery by the Alaska Dept of Fish and Game and believe ADF&G to be excellent stewards of the resource.

Thankyou

Tom Meiners

F/V Admiral

SE Seiner

NSRAA board member

SEAS board member

805 Goldbelt Juneau AK 99801

Submitted By
Trae Lohse
Submitted On
10/3/2018 10:46:19 AM
Affiliation

Date: 10/3/18
Fisherman: Trae Lohse
Vessel: F/V Catalyst
Homeport: Cordova

To: Alaska Board of Fisheries

RE: Comments on Hatchery Related ACRs

Dear Chairman Jensen and Board of Fisheries Members,

I am a commercial fisherman from Prince William Sound. I oppose the acceptance of ACR 1 and ACR 2.

ADFG Staff comments regarding these ACRs found no purpose or reason for a conservation concern. The ACRs do not correct an error in regulation. The ACR does not address an effect of a regulation on a fishery that was unforeseen when that regulation was adopted.

For these reasons, ACR1 and ACR2 do not meet the criteria for the Board of Fisheries to accept these Agenda Change Requests.

Additionally, Alaska's salmon hatchery program is integral to the economic sustenance of rural communities. Hatcheries support sport, personal use, susbsistence, charter, and commercial fisheries throughout the state, and provide tax revenues for local and state governments.

The hatchery programs are heavily science-based and decisions regarding hatchery production rely heavily on current data. There are no stocks of concern where most hatchery production occurs and historically, hatchery production has alleviated pressure on wild stocks. During the last decade Prince William Sound and the Copper River have seen record breaking runs for the areas of both wild Pink Salmon and wild Sockeye salmon respectively, despite hatchery release numbers being largely unchanged from what they are today.

Hatcheries should continue to be overseen by the Regional Planning Teams and ADFG biologists, who know and understand the history of salmon enhancement in Alaska.

Thank you for your consideration.

Signed,

Trae Lohse

5303 Shilshole Ave. NW, Seattle, WA 98107-4000
(206) 783-3818 • Fax: (206) 782-7195

October 2, 2018

Alaska Board of Fisheries
John Jensen, Chair
Via email dfg.bof.comments@alaska.gov

RE: Comment on ACR 1 and 2 regarding hatchery permits

Chairman Jensen and Board Members:

Thank you for the opportunity to comment on ACRs 1 and 2 before the Alaska Board of Fisheries (Board) at the October work session. **Trident opposes both petitions and requests that the board not approve the agenda change requests.**

Trident is heavily invested in the sustainability of Alaska's wild salmon. We operate eleven facilities that process salmon throughout Alaska and employ more than 3,000 in salmon processing labor. We buy and process all five species of Pacific salmon and have made significant investments in our facilities to ensure that we remain competitive to the independent fishermen that we purchase from and in global markets where we sell Alaska salmon. Hatchery-origin pink and chum salmon provides important stability that allows us to maintain operations, support our independent fishermen and communities where we operate, and expand markets through investing in new product development and sales strategies, all of which benefits the State of Alaska.

The Precautionary Principle Should Not Be Abused

Since its inception, the hatchery program has been built upon science-based management, a transparent public process, and a regulatory framework that prioritizes protection of wild salmon populations.[1] Most importantly, the precautionary principle is embedded throughout the hatchery management framework. Adherence to this principle is a key factor in the program's success over the past forty years. This principle is only valuable, however, if it is part of a robust decision-making framework that can effectively evaluate risk and uncertainty regarding the best available science. Issues relating to ocean carrying capacity and hatchery/wild interactions are complex and require a more thorough analysis than what has been presented by the petitioners of ACRs 1 and 2. The petitioners make no conclusive,

[1] Key aspects of hatchery management in Alaska include: prioritization of wild salmon stocks; vigorous habitat protection; mitigation of pressure on wild stocks; annual review of all hatchery plans by ADF&G; comprehensive regional planning; conservative fish culture practices; a robust hatchery permitting process that includes genetics, pathology, and fishery management reviews; statewide genetics policy to protect wild stocks; regulations protecting against disease outbreaks; careful siting of hatchery locations; broodstock diversity and localization practices; mass otolith thermal marking in Prince William Sound and Southeast; and annual public reporting requirements.

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science-based claims that a reduction of twenty million eggs, or a twenty-five percent decrease in total hatchery production, will have a positive impact on Alaska wild salmon returns. Simply, they are exploiting the precautionary principle to achieve a desired policy outcome.

ACRs 1 and 2 Undermine the Existing Process

ACRs 1 and 2 further undermine the existing process by asking the Board to override ADF&G's expertise and experience with respect to the management of hatchery permitting and production levels. This precedent would create great uncertainty in the permitting process, as it effectively replaces the existing regulatory process with *ad hoc*, politicized management. It would also likely lead to the Board engaging in annual management of hatcheries throughout the state, which will reduce Board capacity and negatively affect the ability of the Board and ADF&G to carry out their respective missions. Moreover, the process already provides multiple avenues for public input and concern. Stakeholders that seek to alter existing permits have opportunity to participate in the existing process and should not be given opportunity to circumvent that process in hopes of getting a different result.

Comprehensive Research is Underway

The North Pacific Anadromous Fish Commission (Commission) —an international body made up of the five nations[2] with significant Pacific salmon populations—has been studying ocean carrying capacity for over two decades, looking at information including, but not limited to, global and regional oceanic and atmospheric effects, stock identification and genetic stock structure of salmon forage fish species, ecosystem monitoring and retrospective growth studies of salmon, and laboratory experiments on the behavioral and physiological ecology of salmon. Next year, the Commission is planning a study focused on the Gulf of Alaska that aims to better understand the ocean phase of the salmon life cycle,[3] which will lead to improved understanding of salmon abundance and carrying capacity in the North Pacific. This work will help inform hatchery management in Alaska and can be utilized within existing process.

Similarly, ADF&G, in partnership with the Prince William Sound and Sitka Sound Science Centers, are in the process of completing an eleven-year study focused on evaluating the interactions of wild and hatchery chum and pink salmon in Prince William Sound and Southeast Alaska.[4] The study, which spans over multiple salmon life cycles, analyzes the degree of hatchery pink and chum straying, the genetic structure of pink and chum salmon, and the impact on wild salmon productivity. This type comprehensive and long-term scientific information has, and will continue to, inform the hatchery permitting process.

[2] Commission member nations are the United States, Canada, Russia, the Republic of Korea, and Japan.
[3] https://npafc.org/iys/
[4] http://www.adfg.alaska.gov/index.cfm?adfg=fishingHatcheriesResearch.main

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Conclusion

We appreciate the opportunity to comment and appreciate the Board's responsibility of maintaining our State's world-class fishery resources. To that end, we ask that the Board consider the robustness of the existing hatchery permitting framework, as well as the destabilizing effect that acceptance of ACRs 1 and 2 would have on that framework and our State's fisheries as a whole. With its reliance on the best available data and the expertise of fisheries scientists and managers, Alaska's iterative and comprehensive approach to hatchery management is the best process through which to evaluate scientific uncertainty. Accordingly, we ask that the Board deny ACRs 1 and 2 and reject any other action that undermines the hatchery management framework.

Sincerely,

Shannon Carroll
Associate Director of Public Policy
Trident Seafoods Corporation

Submitted By
UCIDA
Submitted On
10/3/2018 12:20:46 PM
Affiliation

Phone
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Email
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Address
43961 K-Beach Rd, Ste E
Soldotna, Alaska 99669

UCIDA does not support ACRs 1 or 2. ACRs 1 and 2 do not comply with the ACR criteria, nor do they have reliable scientific data to support the allegations.

UCIDA supports ACR 6 because it shares the conservation burden amongst all users. After the management decisions of 2018, it is obvious we need Board direction for ADF&G to implement the sharing of the conservation burden. This ACR is warranted to avoid a repeat of the 2018 Cook Inlet disaster in 2019.

UNITED FISHERMEN OF ALASKA

Mailing Address: PO Box 20229, Juneau AK 99802-0229
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October 3, 2018

Alaska Board of Fisheries
Alaska Department of Fish and Game, Boards Support Section
P.O. Box 115526
Juneau, Alaska 99811-5526

Dear Chairman Jensen and the Alaska Board of Fisheries,

United Fishermen of Alaska (UFA) is the statewide commercial fishing trade association, representing 36 commercial fishing organizations participating in fisheries throughout the state, and the federal fisheries off Alaska's coast.

In preparation for the upcoming Alaska Board of Fisheries Work Session October 15–16, 2018, UFA has comments on ACR 1, 2, 10, and 11.

ACRs 1 and 2 - OPPOSE

United Fishermen of Alaska is opposed to Agenda Change Requests (ACRs) 1 and 2 pertaining to hatchery production. We urge the board to reject these two ACRs because they do not meet the criteria for acceptance of an ACR.

The hatchery named in ACR 1 is managed through a collaborative, public process involving the Alaska Department of Fish and Game (ADF&G), the Regional Planning Team, and the Valdez Fishermen's Development Association; the rest of the state's hatcheries are managed similarly. This process is years in the making and undergoes strict scrutiny to determine hatchery production. The issue of ocean carrying capacity is not a statewide issue—it is an international issue which lacks scientifically tested empirical evidence.

The Alaska hatchery program is important to state, regional, and local economies; they help provide for stable communities by supporting sport fishing, tourism, personal use fishing, commercial fishing, seafood processing, along with other economic benefits that spread throughout the state.

We ask that the board follow its own *Joint Protocol on Salmon Enhancement* (Policy 2002-FB-215) which requests annual department/board meetings regarding hatcheries. "The hatchery meetings will provide an opportunity for the board and the public to receive reports from the department on hatcheries issues including: production trends, management issues, updates on hatchery planning efforts, wild hatchery stock interactions, biological considerations, and research."

By re-introducing the practice of these annual meetings, the board and public will be kept abreast of hatchery issues and we will not continue to be faced with repeated emergency petitions, ACRs, and proposals based on fear and misinformation.

Attached to this letter is UFA's Hatchery Resolution 2018-2, which was approved by the UFA board at its 2018 Annual Fall Meeting.

ACR 10 - OPPOSE

United Fishermen of Alaska opposes ACR 10, which seeks to close the Sitka Sound commercial sac roe herring fishery. ACR 10 does not meet the criteria for acceptance of ACRs. Similar proposals were just heard last year in the appropriate board cycle. UFA supports sustainable, science-based management of fisheries. Fishermen depend on ADF&G data analyses, sound management, and the ASA herring model for a healthy and sustainable herring stock in Sitka Sound. The department has initiated outside peer review of its ASA model by the University of Alaska and the leading University of Washington fishery modeler Andre Punt. UFA believes ADF&G's Sitka Sound herring stock assessment is based on fundamental scientific principles, good data, and peer review.

ADF&G's commitment to precise biomass estimates is further shown in its current research project to determine the maturity at age composition of the Pacific herring in Sitka Sound using scale samples. We ask the board to please put this issue to rest and vote no on ACR 10.

ACR 11 - SUPPORT

United Fishermen of Alaska supports ACR 11, which seeks to align regulations for sport fishing services and sport fishing guide services. ACR 11 is an ADF&G proposal that brings back the regulations previously in place before the legislature temporarily enacted legislation that superceded the regulations. It is essential for ADF&G to have a system of registration and communication with operators of fishing guide businesses in order to measure activity and harvest for effective fisheries management. Without such a system to accomplish the objectives regarding recreational fisheries in the Magnuson-Stevens Fishery Conservation and Management Act of 2005, it is our belief that the State of Alaska will be in jeopardy of losing management jurisdiction over marine fisheries to the federal government.

Thank you for this opportunity to comment on these matters that impact our members and thousands of Alaska commercial fishermen.

Matt Alward
President

Frances H. Leach
Executive Director

UNITED FISHERMEN OF ALASKA

Mailing Address: PO Box 20229, Juneau AK 99802-0229
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UFA Resolution 2018 – 02

A RESOLUTION IN SUPPORT OF THE ALASKA SALMON HATCHERY PROGRAM

WHEREAS, United Fishermen of Alaska (UFA) is the statewide commercial fishing trade association, representing 36 commercial fishing organizations participating in fisheries throughout the state, and the federal fisheries off Alaska's coast, with the mission "*To promote and protect the common interest of Alaska's commercial fishing industry, as a vital component of Alaska's social and economic well-being; and*

WHEREAS, the United Fishermen of Alaska benefits greatly from the State of Alaska Salmon Hatchery Program; and

WHEREAS, there has been a recent decline in some southeast Southeast Alaska Chinook stocks, there is no scientific literature suggesting the decline is due to hatchery chum or pink salmon production, and there have been many high Chinook abundance years in the past two decades with simultaneous record wild and enhanced pink salmon returns; and

WHEREAS, Pacific Rim hatchery programs from Japan, U.S., Russia, Korea, and Canada release approximately 5 billion fry annually, there is an estimated additional 20 billion wild salmon fry; of which the combined biomass represent only 3% of all nektonic feeders in the North Pacific Ocean. Squid alone represent another 4%; and

WHEREAS, Alaska's salmon hatchery program has operated for 45 years and supplements wild salmon harvests throughout the state; and

WHEREAS, Alaska's salmon hatchery program is an example of sustainable economic development that directly benefits subsistence fishermen, personal use fishermen, sport fishermen, charter fishermen, commercial fishermen, seafood processors, as well as state and local governments, which receive raw fish tax dollars; and

WHEREAS, Alaska's salmon hatchery program employs strong scientific methodology with rigorous critical review of hatchery-proposed operations including the genetics policy, origin of broodstock, scrutiny of rearing and release locations, and interactions with naturally occurring stocks with a priority on those natural stocks through the Regional Planning Team process; and

WHEREAS, Alaska's salmon hatchery program is built upon precautionary principles and sustainable fisheries policies to protect wild salmon populations; and

WHEREAS, the Alaska Department of Fish and Game regulates hatchery operations, production, and permitting through a transparent public process and multi-stakeholder development of annual management plans; and

WHEREAS, returns of hatchery and wild salmon stocks follow similar survival trends over time and the largest returns of both hatchery and wild salmon stocks have largely occurred since hatchery returns began in about 1980; and

WHEREAS, there are no Stocks of Concern where most hatchery production occurs, indicating that adequate escapements to wild stock systems are being met in these areas over time; and

WHEREAS, Alaska hatcheries contributed an annual average of nearly 67 million fish to Alaska's commercial fisheries in the past decade; and

WHEREAS, Alaska hatcheries accounted for 22% of the total common property commercial catch and 43% of the total ex-vessel value in the Southeast region in 2016; and

WHEREAS, Alaska's salmon hatchery program has proven to be significant and vital to Alaska's seafood and sportfish industries and the State of Alaska by creating employment and economic opportunities throughout the state and in particular, in rural coastal communities; and

WHEREAS, Alaska's salmon hatchery program is non-profit and self-funded through cost recovery and enhancement taxes on the resource and is a model partnership between private and public entities; and

WHEREAS, the State of Alaska has significantly invested in Alaska's salmon hatchery program and associated research to provide for stable salmon harvests and to bolster the economies of coastal communities while maintaining a wild stock escapement priority; and

WHEREAS, Alaska salmon fisheries, including the hatchery program, continue to be certified as sustainable by two separate programs, and

THEREFORE BE IT RESOLVED that the United Fishermen of Alaska affirms its support for Alaska's salmon hatchery programs; and

FURTHER BE IT RESOLVED that the United Fishermen of Alaska supports unbiased and scientific methods to assess the interaction of Alaska's salmon hatchery programs with natural salmon stocks, such as the Alaska Hatchery-Wild Salmon Interaction Study which began in 2011 and is scheduled to conclude in 2023; and

FURTHER BE IT RESOLVED that the United Fishermen of Alaska calls on the Alaska Board of Fisheries to work with the hatchery community, the Alaska Department of Fish and Game, and industry leaders to further its understanding of the importance of the Alaska salmon hatchery program to all Alaskans.

Approved and signed this the 2 day of Oct. 2018

By the UFA Board of Directors, September 27, 2018.

Matt Alward, President

Attest: Frances Leach
Executive Director

Submitted By
Jeff Stephan
Submitted On
10/3/2018 11:59:29 PM
Affiliation
United Fishermen's Marketing Association

Phone
907-350-2088
Email
jeff.stephan@me.com
Address
PO Box 2917
Kodiak, Alaska 99615

To: Members of the Alaska Board of Fisheries

From: Jeff Stephan, United Fishermen's Marketing Association

Date: October 3, 2018

Subject: Alaska Board of Fisheries Work Session; ACR 1 and ACR 2 (October 15 & 16, 2018)

The United Fishermen's Marketing Association (UFMA) respectfully requests that the Alaska Board of Fisheries (Board) reject further consideration of the following Agenda Change Requests (ACR):

ACR 1: Prohibit VFDA from incubating, rearing, and releasing pink salmon resulting from additional egg take capacity permitted in 2018 and cap egg take capacity (KRSA) (PDF 33 kB)

ACR 2: Cap statewide private non-profit salmon hatchery egg take capacity (Virgil Umphenour) (PDF 55 kB)

Neither ACR 1 nor ACR 2 conform to the criteria that the Board is required to utilize for considering an Agenda Change Request (i.e., 5 AAC 39.999).

The Board should not involve themselves in the manner and level of interference of hatchery operations that are requested in ACR 1 and ACR 2. This is especially true in light of the complexity of these operational procedures, that fact that they do not clearly fall within the authority and purview of the Board, and the important fact that the Alaska Department of Fish and Game (ADF&G) is given, and applies, the authority and responsibility to address the overall operation of hatchery operations, and, specifically, with respect to those that are suggested in ACR 1 and ACR 2.

We respectfully request that you reject ACR 1 and ACR 2, and take no further action to address these ACRs, or the concepts that they profess.

Thank you for your consideration of our comments with respect to your consideration of ACR 1 & ACR 2.

Sincerely,

Jeff Stephan

United Fishermen's Marketing Association

PO Box 2917

Kodiak, AK 99615

tel/mobile: 907-350-2088

email: jeff.stephan@me.com

VALDEZ FISHERIES DEVELOPMENT ASSOCIATION, INC.
SOLOMON GULCH HATCHERY

P.O. Box 125 Valdez, AK. 99686 1815 Mineral Creek Loop Road Valdez, AK 99686
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September 29, 2018

Alaska Dept. of Fish & Game
Alaska Board of Fisheries
PO Box 115526
1255 W. 8th Street
Juneau, AK 99811-5526 via email: dfg.bof.comments@alaska.gov

RE: ACR1-Prohibit Valdez Fisheries Development Association from incubating, rearing, and releasing pink salmon resulting from additional egg take capacity permitted in 2018 and cap egg take capacity at the level permitted in 2017(5 AAC 24.366)

RE: ACR2 – Cap statewide private non-profit hatchery egg take capacity at 75% of the level permitted in 2000 (5 AAC 40.XXX)

Chairman Jensen, Members of the Alaska Board of Fisheries:

Thank you for the opportunity to provide written comments on the Alaska Hatchery Program and the Agenda Change Requests submitted by the Kenai River Sportfishing Association and Mr. Virgil Umphenour for consideration by the Board of Fisheries. The Valdez Fisheries Development Assoc. Inc., provides the following comments on ACR 1&2, as they effect the production of the Solomon Gulch Hatchery operated by the VFDA specifically, and affect Alaska's salmon enhancement programs and those that depend on them as a whole.

ACR1 - Prohibit Valdez Fisheries Development Association from incubating, rearing, and releasing pink salmon resulting from additional egg take capacity permitted in 2018 and cap egg take capacity at the level permitted in 2017(5 AAC 24.366)

The history surrounding the basis of ACR1 is long and well documented before the Board of Fisheries. The proposers requested the BOF take action on their concerns through the emergency petition process beginning in January 2018 with the submittal of RC027 by Nancy Hillstrand. Later, on May 14th and again on July 17th, formal petitions for emergency finding were submitted. Each time the board found that the proposers concerns did not constitute an emergency under 5 AAC 96.625(f). The Commissioner of ADF&G concluded in letters submitted to the BOF on June 14th that the permitting of an additional 20 million pink salmon eggs at Solomon Gulch hatchery did not constitute an emergency because; *" it is not unforeseen that some level of straying occurs in pink salmon stocks and concerns over straying effects and potential fishery management complications arising from increased pink salmon production levels were discussed by the RPT and department when the 2014 SGH PAR was considered and approved*." In fact, the concerns of the proposers were considered by the department at the inception of Alaska's hatchery program, and policies and regulations were adopted to mitigate concerns associated with straying.

ACR1 is a further attempt to subvert ADF&G's regulatory process and authority, which is based on science and applies a precautionary principle in setting hatchery policy. It undermines the well-practiced and long standing authority given the Commissioner by the Alaska Legislature in 1979. The proposer of ACR1 continues to demand intervention in a settled matter. Even now after the fact, and having failed to participate in an open public permitting process, the proposers seek to interject themselves and reverse an approved and reasonable hatchery production increase which underwent a rigorous internal ADF&G and public review.

ACR1 makes several broad and unsubstantiated claims in its justification a fishery conservation purpose or reason exists for its request for hearing. The proposers also provide a contradictory statement that hatchery pink salmon are

causing adverse impacts on wild salmon through food competition, yet acknowledge there is record high salmon abundance in the North Pacific Ocean.

ACR1 tries to link the justification of a fishery conservation purpose or reason to "*an unacceptable level of straying of pink salmon produced by PWS hatcheries to areas outside of PWS, in particular Lower Cook Inlet*." These are the proposer's assertions, not the departments. ADF&G Central Regional Supervisor Bert Lewis, when questioned by member Payton on July 17th provided the following response, "*I don't believe we have a set stray rate, and you can find various references to numbers either in comprehensive management plans or the genetic policy, but there's not a set number in the hatchery policy I do not believe."* Although research on this topic continues, the state has not determined a rate of straying that is unacceptable. Until one is established through credible scientific analysis and with department consensus, taking regulatory action on the demands of a small group is premature. VFDA supports the research being conducted by the Hatchery/Wild Interaction Study to determine if, and to what extent, harm by hatchery strays pose to wild salmon stocks. VFDA has submitted relevant comments in July (PC178) which further challenge the petitioner's argument that hatchery strays are at an unacceptable level or cause harm to LCI wild stocks.

ACR1 states that *"The magnitude of releases of hatchery produced pink salmon in PWS poses a threat to wild stocks of salmon in the Gulf of Alaska."* The proposer's further state*, "Massive releases of pink salmon from hatcheries located in PWS appear to be jeopardizing marine survival of wild stocks of Sockeye and Chinook salmon bound for the rivers and streams flowing into the North Gulf Coast."* There is no empirical evidence that concludes that PWS hatchery production, which has been in existence for 40 years, poses a threat to wild stocks in the Gulf of Alaska or to any other species in the North Pacific marine environment. There is even less evidence to conclude that PWS hatchery production is directly linked to a decline in marine survival of Cook Inlet Sockeye and Chinook salmon, or has led to any decline of statewide salmon returns. These appearances were refuted by analysis of the proposers cited studies submitted in July (PC003) by the hatchery groups.

Claims that pink salmon catches for 2018 in LCI are above forecast due to PWS hatchery strays is supposition and may be caused by several factors, including increased returns to LCI hatcheries. Examining the ADFG Pink Salmon Otolith Sampling Summary 2017, show estimated PWS hatchery contributions to the LCI seine and set net fisheries were between 2-12% that year. This is not new information to support the petitioner's conservation purpose or reason, and both the BOF and ADF&G are aware of this fact.

This ACR is most certainly allocative and affects access to and the harvest of hatchery produced pink salmon in PWS. The proposers fail to address this sufficiently, nor provide any new information for the board to consider. The authors of ACR1 have no involvement in the salmon fisheries of PWS, yet seek to reduce production of one of the most successful fishery enhancement programs in Alaska. This summer, VFDA produced an estimated 42% of all PWS pink salmon catches and 21% of the pink salmon harvest of the entire state of Alaska. The ACR would clearly allocate the benefit of this production away from the commercial fishers of PWS. The sport, personal use, and subsistence fisherman of the sound may also feel these impacts.

To be clear, if ACR1 is passed the BOF would be approving the killing and waste of 19 million live salmon. VFDA completed its approved 20 million increased egg take goal in August. Denying our ability to incubate, rear, or release these additional fish is unacceptable and a radical departure from the responsible operation of Alaska's hatcheries. This request is unprecedented and we believe has never been required of a hatchery operator by the BOF or ADF&G in the history of the enhancement program. It will have far reaching consequences on the marketability of Alaska's salmon resources, creates financial uncertainty for fishermen and those that loan to them, and the hatchery operators. It sets precedence that long established tenets of Alaska's hatchery permitting process are now unreliable and subject to the whims and the politics of the Board of Fish. If approved the news headlines would certainly be a dark day for Alaska.

VFDA objects in the strongest possible manner to the board accepting Agenda Change Request 1 for hearing because it does not establish a credible fishery conservation purpose or reason and is predominantly allocative.

ACR2 - Cap statewide private non-profit hatchery egg take capacity at 75% of the level permitted in 2000 (5 AAC 40.XXX)

ACR2 fails to define any fishery conservation purpose or reason and simply relies on the unsubstantiated claims stated in ACR1. The ACR is allocative for reasons stated in ACR1 because it will eliminate opportunity to Alaska's fishermen and businesses who benefit from hatchery production. For these reasons ACR2 does not meet the guidelines required in 5 AAC 39.999. VFDA provides these examples of actual impacts to the common property harvesters of PWS resulting from the proposal:

- ACR2 will require the immediate reduction of 97.5 million pink salmon eggs (36%) from VFDA's current hatchery program. This will result in the loss of an average harvest of 6.8 million adult pink salmon worth an estimated ex vessel value of $8.7 million annually to the PWS seine fleet. In addition, millions in revenue will be lost to the seafood industry in first wholesale value and lost tax revenue to the state and its municipalities.

- ACR2 would require the reduction of 500,000 coho salmon eggs (25%) from VFDA's sport fish program. The loss of VFDA sport fish opportunity to Southcentral and Interior Alaska fisherman is estimated to be 24,000 fish per year, creating far reaching impacts to businesses in Valdez and elsewhere. On a statewide level it will be far more devastating, requiring the elimination of an estimated 37% of all hatchery produced species from current levels. The loss of prized sport fish such as Coho and Chinook salmon to the lodge and charter industries of coastal Alaska will be significant. Hatchery stock contributions to the Copper River dip net and subsistence fisheries may be reduced as well.

- ACR2 will force the BOF to reopen painstakingly crafted allocation plans between gear groups that rely heavily on the contributions of hatchery salmon.

- ACR2 will further increase pressure on natural stocks as users seek to find fishing opportunity from other sources due to lost hatchery production.

VFDA objects in the strongest possible manner to the board accepting Agenda Change Request 2 for hearing because it fails to qualify under the guidelines of 5 AAC 39.999.

The Board of Fisheries must consider requests to amend production or reduce Alaska's hatchery programs very carefully. Its actions have significant consequences to the state's fishermen, the hatcheries themselves, markets, and the public perception of resource sustainability. Taking any regulatory action is premature at this time given the status of ongoing research. In addition, ambiguity of board authority exists, that if acted upon as desired by the proposers may be found to be contrary to legislative intent which clearly separated the roles of the board and department years ago. This separation, which has been practiced by the board for the last four decades, has served the state well.

VFDA would suggest that the board take no action on ACR's 1 & 2 or any other request to amend hatchery production. VFDA supports re visiting the process outlined in the Joint Protocol on Salmon Enhancement #2002-215-FB, which the board has long ignored. The aquaculture groups have attended nearly all BOF meetings since the Protocol was adopted and are always available for discussion in the process. This October work session forum will provide opportunity for the board and the department to address the public's concerns and bring the scientific community together to assess potential impacts of hatchery production. The current process of ADF&G and BOF regulatory oversight was developed from a scientifically based set of protocols and policies. The system isn't broken, although ongoing research and knowledge should be considered before making changes to an important program to all Alaskans. Thank you for your consideration.

Sincerely

Mike H. Wells
Executive Director

October 2018

ECONOMIC IMPACT OF THE

Valdez Fisheries Development Association Inc.

VFDA

Prepared for
Valdez Fisheries Development Association Inc.

Prepared by
McDowell GROUP

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Summary of Key Findings

This report describes the economic impact of the Valdez Fisheries Development Association (VFDA) on the Alaska economy. VFDA is a nonprofit salmon hatchery located in Valdez. In addition to supporting significant commercial and sport harvest of salmon, the organization contributes to the development of Prince William Sound (PWS) fisheries through operation of a Fisheries Business Incubator. VFDA also processes and sells salmon products for retail and wholesale purchase. A summary of key findings are detailed below

Commercial Fishing

- VFDA salmon are harvested primarily by PWS seiners. Between 2012 and 2017, seiners harvested an annual average of 55 million pounds of VFDA-produced salmon worth $19 million annually. The VFDA-related salmon harvest had a cumulative six-year total volume of 329 million pounds worth $116 million.
- VFDA accounted for 33 percent of the total PWS seine common property harvest between 2012 and 2017. Over the six-year period seiners harvested an average of 166 million pounds of common property salmon, totaling 996 million pounds. This harvest had an annual average ex-vessel value of $58 million and total six-year value of $347 million.
- PWS seine permit holders earned an annual average of $265,000 over the 2012-2017 period. VFDA salmon accounted for about $88,000 per year for each permit holder, on average.
- The economic benefits of the PWS seine fisheries are broadly distributed. In 2017, 174 permit holders from 22 different Alaska communities harvested VFDA salmon.

Seafood Processing

- Over the 2012-2017 period, the first wholesale value of VFDA pink salmon — including both common property and cost recovery fish — averaged $63 million annually and totaled $375 million.

- VFDA salmon accounts for nearly a quarter (23 percent) of the total value of all seafood processed in PWS. Between 2012 and 2017, PWS processors sold an annual average of $272 million worth of seafood products, about $1.63 billion in the six-year period.
- According to Silver Bay Seafoods, large volumes of available VFDA-produced salmon is a primary factor underpinning its decision to invest more than $40 million into a new seafood processing plant in Valdez.
- VFDA salmon are processed into fresh, frozen, and canned salmon products, in addition to roe products.

Sport Harvest

- Salmon produced by VFDA are vital to Valdez-area sportfishing. Without VFDA salmon, the Valdez sportfishing sector would not be able to attract the annual influx of Alaska residents and non-residents who pursue coho and pink salmon on guided and unguided trips.

- More than 80 percent of all coho harvested in the Valdez Arm come from VFDA and nearly all pink salmon originated at the hatchery. Due to VFDA production, pink and coho salmon returns have increased significantly over the past decade.
- Valdez's annual salmon derbies rely on VFDA-produced salmon. These derbies attract participants from all over Alaska and the United States to harvest pink and coho salmon. The main Silver Salmon Derby sold more than 3,350 tickets in 2018. More than 500 individuals fished in a one-day women's event and more than 350 children participated in the Kid's Pink Salmon Derby.

- Many of the nearly 100,000 annual visitors (including residents and non-residents) to Valdez harvest salmon produced by VFDA. The opportunity to catch these fish is an important aspect in the quality of visitors' experience in Valdez, prompting visitors to return year-after-year.

Economic Impact

VFDA is credited with supporting an annual average of 760 jobs (including direct, indirect, and induced effects) between 2012 and 2017. VFDA's hatchery operations contributed 70 jobs to this total, along with employment in the seafood processing (345 jobs), commercial fishing (240 jobs), and sport fishing (100 jobs) sectors. Total labor income (wages and salaries) averaged nearly $34 million each year, including all multiplier effects. Total output of VFDA averaged $112 million annually, a 40 percent increase from a previous economic impact analysis of the organization. [1]

Table 1. Summary of Economic Impacts from VFDA, Annual Average 2012-2017

	Direct Impacts	Indirect and Induced Impacts	Total Impacts
Commercial Fishing			
Employment	165	75	240
Labor Income ($Million)	$11.0	$3.6	$14.5
Output ($Million)	$19.3	$12.5	$31.8
Seafood Processing			
Employment	200	145	345
Labor Income ($Million)	$7.9	$4.6	$12.6
Output ($Million)	$39.3	$26.9	$66.2
Sport Fishing			
Employment	75	25	100
Labor Income ($Million)	$2.8	$1.5	$4.3
Output ($Million)	$6.7	$2.3	$9.0
VFDA Operations			
Employment	40	30	70
Labor Income ($Million)	$1.5	$0.9	$2.5
Output ($Million)	$3.4	$1.5	$5.0
Total Impacts			
Employment	490	270	760
Labor Income ($Million)	$23.3	$10.7	$33.9
Output ($Million)	$72.2	$39.9	$112.0

Note: Figures have been rounded and may not add to total.
Source: McDowell Group estimates.

[1] Economic Impact of Valdez Fisheries Development Association, Prepared by McDowell Group, December 2013.

Purpose and Methodology

Valdez Fisheries Development Association, Inc. (VFDA) contracted with McDowell Group to quantify its economic impact on the Alaska economy. This report describes VFDA's impact throughout Alaska, including employment and wages in the commercial fishing, seafood processing, and sportfishing sectors. Additional indirect and induced (multiplier) effects are also considered. The study period for this report is 2012-2017.

Methodology

Data used and presented in this report come from a variety of sources, including VFDA, the Alaska Department of Fish and Game (ADF&G), Alaska Commercial Fisheries Entry Commission (CFEC), Alaska Department of Labor and Workforce Development (DOLWD), National Marine Fisheries Service (NMFS) and the Alaska Department of Revenue (DOR). Additionally, McDowell Group conducted interviews with key industry representatives.

McDowell Group used primary data, information from public sources, and a proprietary input-output model based on IMPLAN to estimate direct, indirect, and induced impacts of VFDA. Though IMPLAN is widely used for economic impact modeling in Alaska and elsewhere, it requires modification for analyses of some Alaska industries, including commercial fishing and seafood processing.

All photos in the report are from Franklyn Dunbar, Neil Gotschall, Jordan Nelson, the Alaska Seafood Marketing Institute, and McDowell Group.

Overview of VFDA Operations

VFDA is a non-profit organization incorporated in 1980 by a group of local residents. The organization's mission is to produce salmon for the benefit of all user groups and support development of local fisheries.

VFDA's board includes representatives of commercial fishing, sport fishing, and visitor industry sectors. The organization is not a regional aquaculture association and collects no tax revenues from local fishermen. VFDA's primary revenue source is sales of pink salmon to processors from cost recovery fisheries. To use all salmon returning to the hatchery, VFDA began processing and selling a portion of its annual cost recovery operations in 2000.

VFDA salmon are harvested primarily in the Valdez Arm by commercial seine vessels, sport anglers trolling from small vessels, and anglers fishing from shore.

Solomon Gulch Hatchery

The Solomon Gulch Hatchery was completed in 1982; VFDA's first release of smolt from the facility occurred the same year. The hatchery is located on Dayville Road south of Valdez.

ADF&G has permitted VFDA to collect and incubate 270 million pink salmon eggs, 2 million coho salmon eggs, and 300,000 Chinook eggs (the hatchery does not currently collect Chinook eggs). In 2017, VFDA released 242 million pink salmon smolt and 1.8 million coho smolt. In the same year, an estimated 14.7 million pink salmon from VFDA returned along with 72,000 coho salmon.

Between 2008 and 2017, the Solomon Gulch Hatchery supported returns of more than 160 million pink salmon and about a million coho salmon.

Salmon hatcheries require significant amounts of freshwater. VFDA receives discharge water from the nearby Solomon Gulch hydroelectric plant owned by the Copper Valley Electric Association. Water used by the hydroelectric plant comes from Solomon Lake which is not populated by salmon due to steep geography.

A portion of returning salmon come directly to the VFDA hatchery and are harvested in a raceway.

VFDA Fisheries Business Incubator

VFDA manages a small educational processing plant that was built in 2003 with funding from VFDA and a U.S. Department of Commerce Economic Development Administration grant. The primary goal of the facility is to assist direct marketers. Commercial fishermen can bring product to market without having to invest significant capital into their own facility.

The incubator can produce a wide variety of products including fresh, frozen, smoked, and cured seafood. The plant's processing equipment includes heading and gutting (H&G) equipment, fillet machines, a smoker, blast freezer, packaging equipment, and other items.

VFDA is the primary user of the facility, processing salmon for its Solomon Falls product line. Two direct marketers also currently use the facility to glaze and freeze spot prawns, among other periodic users.

Solomon Falls Seafood

VFDA produces smoked salmon and caviar products from surplus raceway coho and pink salmon at the Fisheries Business Incubator. These products have met with success. In 2009, VFDA's smoked pink salmon won the Symphony of Seafood Award for best smoked product. VFDA has developed techniques and markets for several value-added salmon products, including hot smoked coho, black pepper coho, teriyaki coho fillets, and ikura-style salmon caviar, among others. Solomon Falls products can be purchased online and in stores around Alaska.

VFDA Cold Storage Facility

VFDA maintains and operates a modular cold storage facility which can store about 300,000 pounds of product at temperatures to -10 degrees. Supported in part by funding from the U.S. Department of Commerce Economic Development Administration, the facility was completed in 2012.

The cold storage facility supplements the capacity and scope of VFDA's Fisheries Business Incubator. Space in the facility is leased by local businesses. Users include local seafood processors, non-profits, sportfish custom processors, shippers handling perishable packages, and local outfitters storing bait.

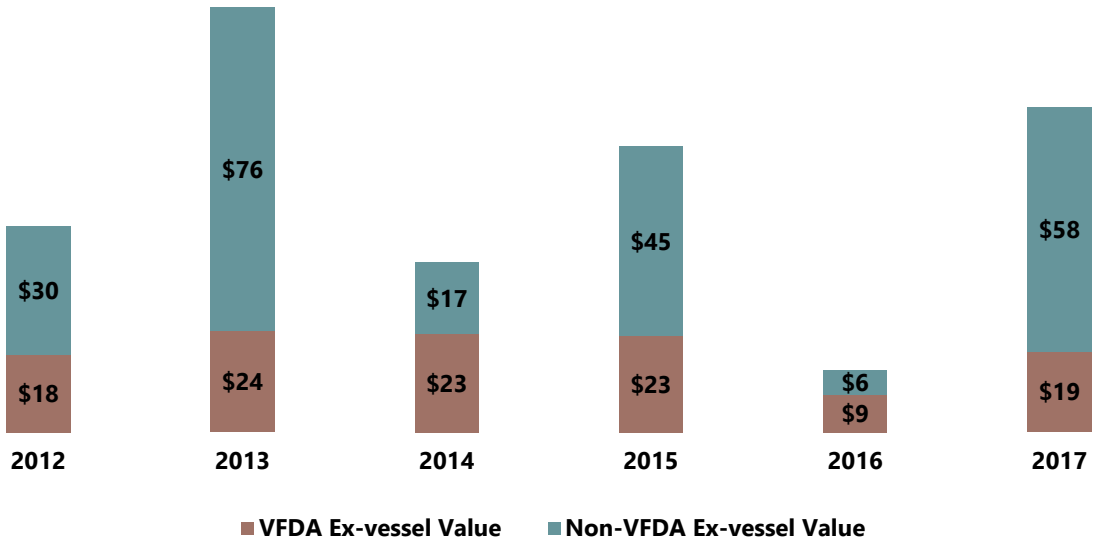
VFDA Administrative Offices

VFDA's administrative offices are located at 1815 Mineral Creek Loop Road in Valdez, in the same facility as the processing plant.

VFDA Salmon in Commercial Fisheries

VFDA salmon are harvested primarily by the Prince William Sound (PWS) seine fleet. Between 2012 and 2017, PWS seiners harvested 996 million pounds of common property salmon worth $347 million – an annual average of 166 million pounds worth $58 million. Of this total, VFDA salmon contributed an estimated $116 million in value or 33 percent of total earnings, averaging $19 million per year.

Figure 1. Value of Prince William Sound Common Property Salmon Harvest by Source ($Million), 2012-2017



Note: Non-VFDA sources include wild and hatchery salmon from Prince William Sound Aquaculture Association.
Source: ADF&G, McDowell Group estimates.

Throughout this period, the number of permits/vessels participating in the PWS seine fishery ranged from 210 in 2013 and 2016 to 230 in 2017, or between 79 and 86 percent of the 267 available permits. Participation has trended higher in recent years: in 2005, just 101 vessels participated.

A captain (often the permit holder) and three to four crew members work on the typical PWS seine vessel. The maximum length for a seine vessel in Alaska is 58 feet.

Earnings of PWS seine vessels totaled $1.6 million on average over the 2012-2017 period, or $265,000 annually. Harvest of VFDA salmon contributed 33 percent of this amount, totaling $529,000 over the period or about $88,000 per year.

PWS seine permit prices ranged from a high of $204,600 in 2014 to a low of $147,900 in 2016. Permit prices generally track the recent harvest value of the fishery, rising during or after a strong season and declining during or after a poor season.

Table 2. Prince William Seine Common Property Fishery, 2012-2017

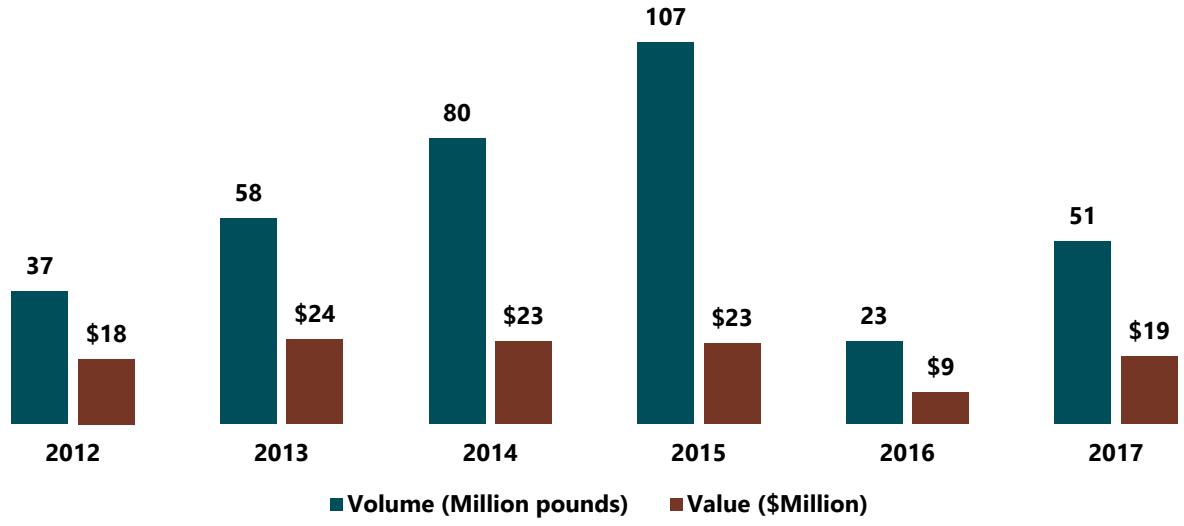
	2012	2013	2014	2015	2016	2017
Ex-vessel Value ($Million)	$48.6	$100.1	$40.0	$67.4	$14.5	$76.6
Ex-vessel Volume (millions of lbs.)	95.5	243.8	130.8	306.1	36.1	183.2
Permits Fished	224	210	222	216	210	230
Percent of Permits Fished	84%	79%	83%	81%	79%	86%
Average Earnings Per Permit	$216,742	$476,738	$179,982	$311,815	$69,272	$332,975
Percent of Ex-vessel Earnings from VFDA	38%	24%	58%	34%	61%	25%
Average Earnings per Permit from VFDA	$81,303	$113,281	$104,457	$104,723	$42,000	$82,744
Average Permit Prices	$168,700	$168,000	$204,600	$186,700	$147,900	$154,500

Note: Reflects data for S 01E fishery; 2017 data is preliminary.
Source ADF&G, CFEC, PWSAC, and McDowell Group estimates.

Commercial Harvest of VFDA Salmon

Between 2012 and 2017, an annual average of 59 million pounds of VFDA-produced pink and coho salmon were harvested in common property harvests. The largest annual return of VFDA salmon was 2015's 107-million-pound harvest; the most valuable harvest ($24 million) took place in 2013.

Figure 2. Ex-vessel Volume and Value of VFDA Common Property Harvest, 2012-2017



Source: ADF&G, McDowell Group estimates.

Pink Salmon

The PWS seine fleet is the sole gear type commercially targeting VFDA pink salmon. During the 2012-2017 period, 354 million pounds of VFDA-produced pink salmon were harvested in common property fisheries, worth $114 million. The annual VFDA pink salmon harvest averaged 59 million pounds worth $19 million. Seine-harvested pinks in PWS averaged 3.6 pounds over the study period; ex-vessel prices fluctuated between $0.20 and about $0.50 per pound.

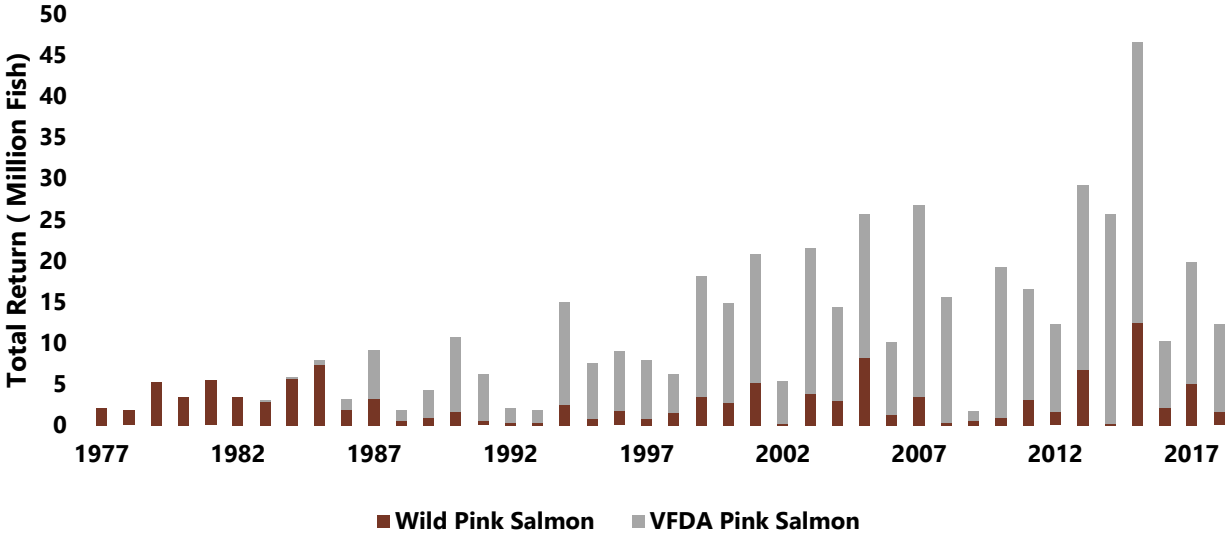
PWS typically produces about 40 percent of the annual Alaska pink salmon harvest. After PWS, Southeast usually produces about a third and Kodiak is the next largest contributor. Areas outside these three regions usually account for less than 10 percent of the annual pink production.

Alaska pink salmon have a two-year life-cycle with even-year populations and harvests generally smaller than those in odd years. This dynamic is observed statewide and is usually the case for VFDA pink salmon. However, the 2014 VFDA pink salmon harvest was about 17 percent larger than the prior, odd year.

VFDA hatchery operations have significantly increased the annual return of pink salmon to the Eastern District of PWS. Prior to VFDA production in the early 1980s, the annual return was generally less than 10 million fish; the 2008-2017 average return of pink salmon was nearly 18 million fish.

In 2015, more than 45 million pink salmon returned to the Eastern District, including a record-breaking 34 million VFDA salmon along with a record-breaking wild return of more than 12 million pinks.

Figure 3. Historical Pink Salmon Returns to PWS Eastern District, 1977-2017



Note: Data presented are best available information. Includes sport and commercial harvest, brood stock and other hatchery harvest, and stream escapements.
Source: ADF&G.

Coho Salmon

While VFDA produces coho primarily for sport harvest, a small commercial harvest occurs. Between 2012 and 2017, a cumulative total of 1.6 million pounds of VFDA-produced coho were harvested worth $1.6 million. The largest harvest occurred in 2013 when 1.2 million pounds of coho were harvested worth $1.2 million.

Geographic Distribution of Commercial Harvest

In 2017, 174 permit holders from 22 different Alaska communities harvested common property salmon worth $58 million in the PWS seine fishery. VFDA-sourced fish contributed about $19 million to this total, or 33 percent.

- Kenai Peninsula Borough residents harvested more than $22 million, including $7.4 million in VFDA salmon. Homer residents earned $16 million and Seward residents harvested $3.0 million worth of salmon. Ten permit holders from seven other Kenai Peninsula communities also generated earnings from the fishery.
- Residents of Cordova were the most active of any Alaska community, with 65 residents earning $18 million. Valdez residents earned $3.9 million. VFDA salmon harvested by residents of these two communities were valued at $7.3 million.
- Residents of the Municipality of Anchorage earned a total of $9.9 million, including an estimated $3.3 million from VFDA fish. Girdwood was represented by 10 residents who earned $6.2 million; nine Anchorage residents earned $2.4 million. Five residents of Chugiak and Eagle River also participated.

Table 3. Residency of PWS Salmon Seine Fleet with Ex-vessel Earnings, 2017

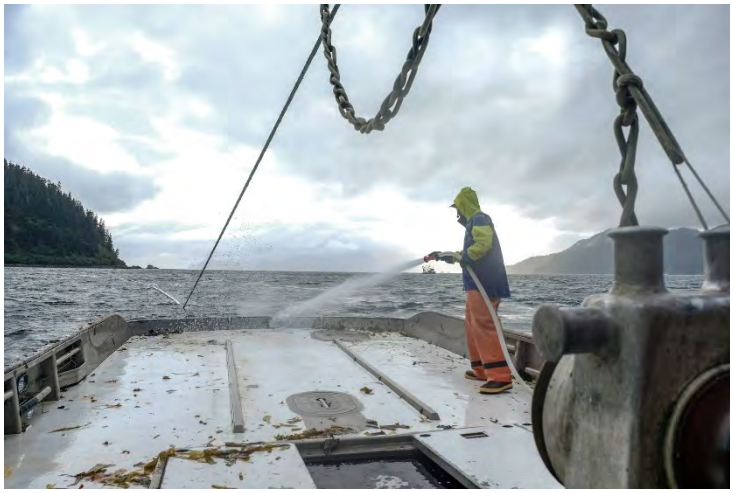
Location	Permits Fished	Total Common Property Earnings
Kenai Peninsula Borough	**55**	**$22,283,155**
Homer	36	$16,000,502
Seward	9	$2,960,571
Kasilof	3	-
Kenai	2	-
Anchor Point	1	-
Nikolaevsk	1	-
Ninilchik	1	-
Soldotna	1	-
Sterling	1	-
Valdez/Cordova Census Area	**78**	**$22,203,966**
Cordova	65	$18,310,197
Valdez	13	$3,893,769
Municipality of Anchorage	**24**	**$9,901,634**
Girdwood	10	$6,224,356
Anchorage	9	$2,394,606
Chugiak	3	-
Eagle River	2	-
Mat-Su	**5**	**$1,039,610**
Wasilla	4	-
Sutton	1	-
Other Alaska	**12**	**$1,964,499***
Kodiak	7	$1,964,499
Juneau	2	-
Dillingham	1	-
Hoonah	1	-
Petersburg	1	-
Alaska Resident Total	**174**	**$58,402,372**

*Subtotal excludes confidential values. (-) indicates values are withheld.
Note: Figures reflect S 01E PWS purse seine fishery.
Source: ADF&G.

- Five residents of the Matanuska-Susitna Borough earned slightly more than a million dollars.
- Residents from other Alaska communities generated earnings from the PWS seine fishery, including Kodiak (7 permit holders), Juneau (2), Dillingham (1), Hoonah (1), and Petersburg (1).

Residents of other states participate in the PWS seine fishery. Washington is home to the largest group of non-Alaska commercial fishermen: in 2017, 35 residents earned slightly more than $11 million. Nearly 20 residents from California, Oregon, and other states earned more than $5.0 million.

Fisheries Business Tax Revenue



VFDA salmon are subject to the State of Alaska Fisheries Business Tax — a 3.0 percent levy on the ex-vessel value of the fish. Half of revenue generated from this tax is retained by the State and the other half is shared with the community and/or borough where the salmon are landed.

Between 2012 and 2017, an estimated $3.5 million was generated from taxation of VFDA salmon. The state received $1.7 million and local government received an equal amount. Cordova, Valdez, and Whittier received most of the local component. VFDA salmon landed in Seward results in tax revenue to both the City of Seward and the Kenai Peninsula Borough.

Because Fisheries Business Tax revenue is based on ex-vessel value, tax receipts can fluctuate significantly year-to-year. VFDA-supported revenue totaled $678,000 in 2015; the following year it declined to $264,000 and rebounded to $570,000 in 2017.

Table 4. Estimated Fisheries Business Tax Revenue from VFDA Salmon by Component, 2012-2017

	2012	2013	2014	2015	2016	2017	Total	Average
State	$273,000	$357,000	$348,000	$339,000	$132,000	$285,000	$1,734,000	$289,000
Local	$273,000	$357,000	$348,000	$339,000	$132,000	$285,000	$1,734,000	$289,000
Total	**$546,000**	**$714,000**	**$696,000**	**$678,000**	**$264,000**	**$570,000**	**$3,468,000**	**$578,000**

Source: McDowell Group estimates based on ADF&G and DOR data and information.

VFDA Salmon in Seafood Processing

Salmon produced by VFDA and harvested commercially are processed into a variety of products. This processing activity adds significant value to VFDA salmon and supports additional employment and associated economic activity. Hatchery-produced salmon supplement wild-stock returns and helps stabilize the annual harvest. VFDA salmon are processed primarily in Valdez and Cordova; some volume is landed in Seward, Whittier, and other Alaska ports.

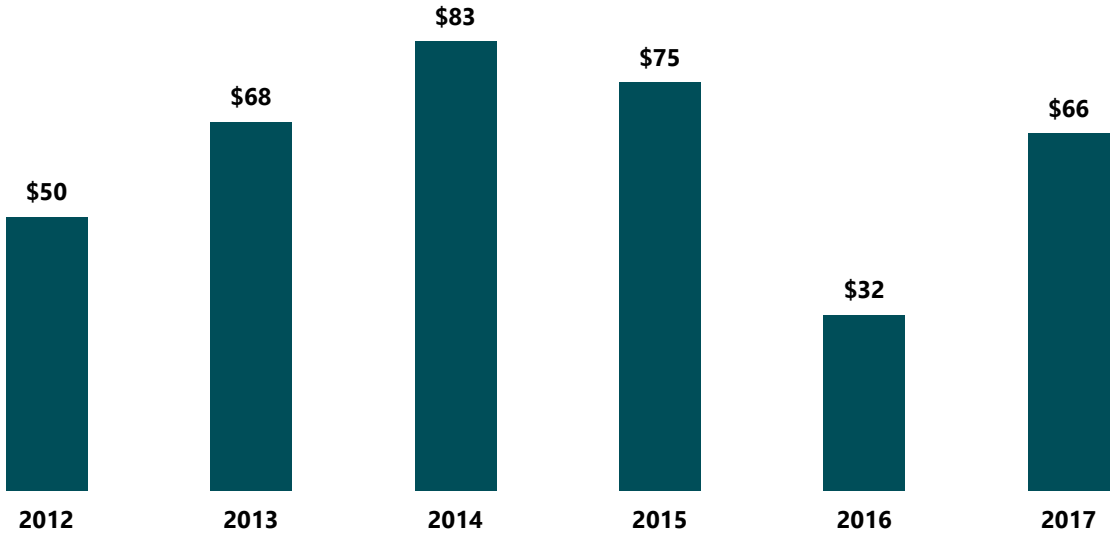
The primary product form for pink salmon is frozen headed and gutted (H&G), which is shipped out of Alaska to undergo additional reprocessing. A declining portion of pink salmon are canned. In 2012, about half of all Alaska pink salmon were canned; in 2017, this proportion had declined to about a quarter. Coho generally receive additional value-add processing such as filleting before being frozen for shipment. A material portion of Alaska's annual coho production goes to market in a fresh form.

Over the 2012-2017 period, the first wholesale value of VFDA pink salmon — including both common property and cost recovery fish — averaged $63 million annually and totaled $375 million. First wholesale value describes the value of seafood products after processing activity such as H&G, filleting, canning, or other processes. The highest value ($83 million) over this period was observed in 2014.

The first wholesale value of VFDA-produced coho totaled $5.9 million during this six-year period.

Another way to consider VFDA's contribution to the Alaska processing sector is to examine the gross margin provided by the organization's fish, or the value remaining after payment to fishermen. After paying harvesters $116 million for salmon, PWS processors earned an estimated gross margin of $265 million from VFDA salmon. This figure is not to be confused with profit margin as processors incur significant costs handling and producing salmon products.

Figure 4. First Wholesale Value of VFDA Pink Salmon Products ($Million), 2012-2017



Note: The cumulative first wholesale value of VFDA-produced coho products over this period was about $5.9 million. Figures include cost recovery volume. Values have been rounded.
Source: ADF&G, McDowell Group estimates.

Seafood Processing in Prince William Sound

PWS processors sold $1.63 billion worth of seafood products between 2012 and 2017. In addition to a relatively small amount of halibut, sablefish, Pacific cod, and other species, salmon was the largest component by far, contributing $1.58 billion or 97 percent of the total. VFDA-sourced salmon contributed an estimated 23 percent to the total PWS first wholesale valve over the study period.

Seward, Valdez, and Cordova have onshore private seafood processing facilities run by the following companies: Copper River Seafoods, Silver Bay Seafoods, Whittier Seafood, Ocean Beauty Seafoods, Peter Pan Seafoods, Prime Select Seafoods, Trident Seafoods, and Wild by Nature. These facilities produce fresh, frozen, and canned salmon products, in addition to roe products. Additionally, VFDA processes limited amounts of raceway surplus salmon for cost recovery, producing H&G and roe for its Solomon Falls label.

Due to the compressed season of salmon harvesting activity, most processing workers are seasonal. A significant number of these workers are not Alaska residents. However, local residents employed in the region's processing sector tend to be employed year-round and earn substantially more than seasonal workers.

Seafood processing plants also contribute to the property tax base in PWS communities. Silver Bay Seafoods and Peter Pan Seafoods are among the largest non-oil property tax payers in Valdez. Nearly $250,000 in Cordova property taxes were paid to the City of Cordova in 2018 by Trident Seafoods, Ocean Beauty Seafoods, and Copper River Seafoods.

Silver Bay Seafoods

VFDA salmon production contributed in-part to attracting Silver Bay Seafoods to PWS. In 2010, Silver Bay Seafoods purchased an aging seafood processing plant in Valdez. After significant investment in land, new buildings, and manufacturing machinery, the company now operates one of the most modern and capable seafood processing facilities in Alaska. The plant is valued at more than $40 million, can process 2.7 million pounds of salmon per day, and employs a peak workforce of 450 individuals. [2]

[2] Personal Communication, Tommy Sheridan, External Affairs Officer, Silver Bay Seafoods, 9/28/2018.

VFDA Salmon in Sport Fishing

Salmon produced by VFDA are vital to Valdez-area sportfishing. Without VFDA salmon, the Valdez sportfishing sector would not attract the annual influx of Alaska residents and non-residents who pursue coho and pink salmon on guided and unguided trips.

VFDA's sportfish program is funded by sales of pink salmon (through cost recovery harvest) and operations grants from the City of Valdez.

Sport fishing activity in Valdez supports many seasonal and year-round businesses. These businesses include hotels, outfitters, charter operators, fishing gear retailers, and boat rental companies. They also include businesses that process, pack, and ship sport-caught fish. Visiting anglers also support local restaurants, gift shops, coffee shops, grocery stores, accommodations, and gas stations.

During the summer of 2016, 71,000 non-Alaska resident visitors traveled to Valdez, according to the Alaska Visitors Statistics Program (AVSP).[3] AVSP indicates about 15 percent of these travelers sport fished while in Valdez. Of these 10,650 non-resident anglers, about half report engaging in a guided trip. Other research conducted by McDowell Group estimates that about 26,500 Alaska residents traveled to Valdez in the summer of 2016.[4] About two-thirds of these Alaska residents reported sport fishing; most did not use a guide.

North Gulf Coast/PWS Sport Salmon Fishery

Between 2012 and 2016 (data are not yet available for 2017), sport fishermen harvested an annual average of 123,000 coho and pink salmon in the North Gulf Coast/PWS (NGC/PWS) region which included Seward, Whittier, Valdez, Cordova, and other communities. The average annual coho harvest of 104,000 coho was the largest component; 18,000 pink salmon were harvested annually.

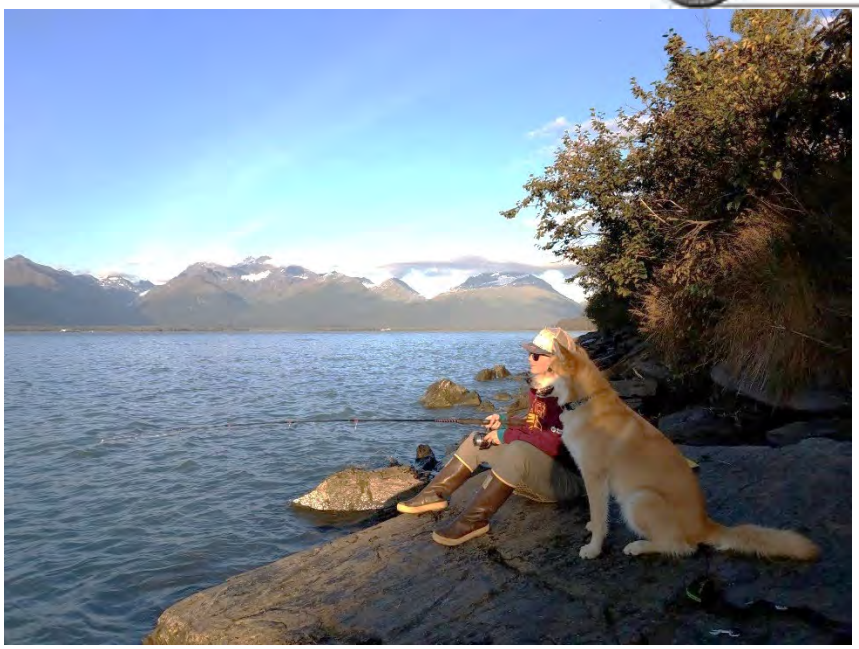
Table 5. Sport-caught Harvest in North Gulf Coast/PWS, 2012-2016

	Coho	Pink	Combined Total
2012	63,000	21,000	84,000
2013	157,000	15,000	172,000
2014	97,000	15,000	113,000
2015	164,000	22,000	186,000
2016	41,000	17,000	58,000
Annual Average	**104,000**	**18,000**	**123,000**
Total	**522,000**	**91,000**	**613,000**

Note: Values have been rounded and may not add to total.
Source: ADF&G.

[3] Alaska Visitor Statistics Program 7, prepared by McDowell Group for Alaska Department of Commerce, Community, & Economic Development, 2017; http://www.alaskatia.org/marketing/alaska-visitors-statistics-program-avsp-vii
[4] Valdez Visitor Market Profile, prepared for the City of Valdez by McDowell Group, 2017.

Salmon harvested in the NGC/PWS region include both hatchery and wild salmon. Between 2012 and 2016, it is estimated that VFDA salmon accounted for about one-in-four coho harvested in the region and nearly nine-of-ten pink salmon.



For sport fishermen harvesting fish in the Valdez Arm, including shoreside at Allison Point or in the City of Valdez and trolling in the area, VFDA salmon is the primary source of salmon.

Between 2012 and 2016, an annual average of 28,000 coho were caught within or near the Valdez Arm.[5] Assuming nearly all VFDA coho are harvested in the same area, more than 80 percent of these coho came from VFDA. Similarly, it is assumed that VFDA is the source for nearly all pink salmon harvested in this area.

Sport Harvest of VFDA Salmon

Over the 2012-2017 period, anglers harvested 240,500 coho and pink salmon produced by VFDA, or about 40,100 fish annually. Nearly all VFDA salmon harvested by the sportfishing sector occurs in the Valdez Arm.

Coho are the largest component of the annual VFDA-supported sport harvest. Over the study period, an annual average of 24,600 were harvested, or 147,700 total fish. Even-year returns in 2012, 2014, and 2016 were significantly below the long-term average.

Compared to other salmon species, coho are one of the largest, often weighing 8-12 pounds. VFDA pink salmon harvested by anglers totaled 92,800 fish between 2012 and 2017, or 15,500 fish annually. Pink salmon is the smallest salmon species, averaging about four pounds per salmon.

Table 6. Sport-caught VFDA Salmon, 2012-2017

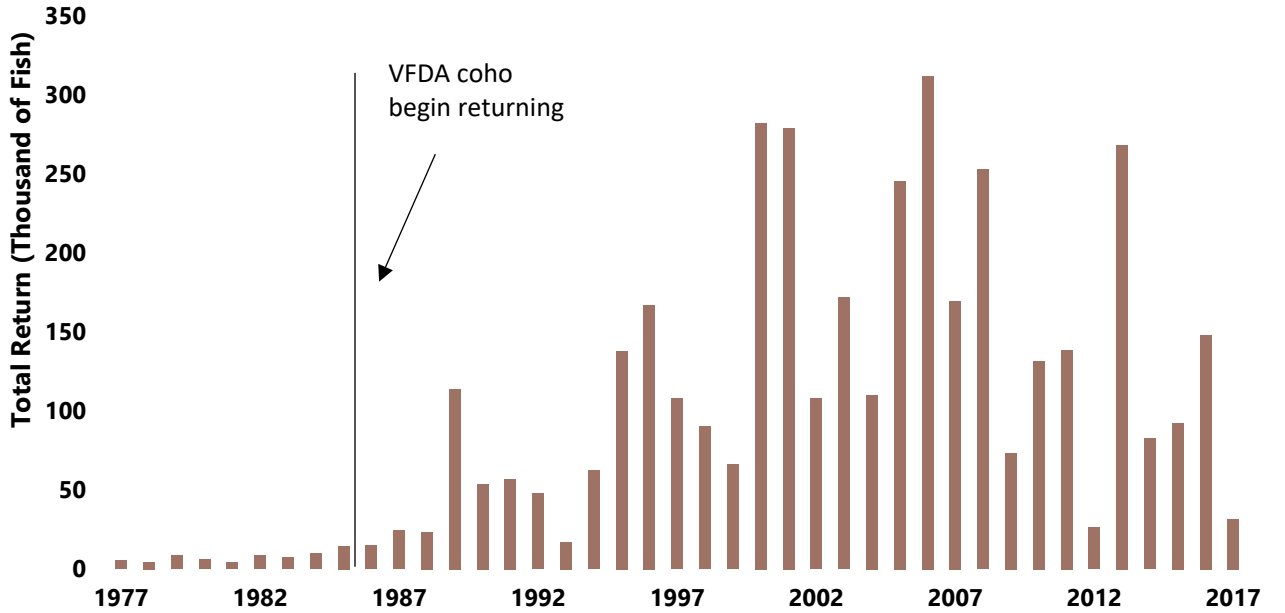
	Coho	Pink	Combined Total
Annual Average	24,600	15,500	40,100
Cumulative Total	147,700	92,800	240,500

Source: ADF&G.

[5] Alaska Sport Fishing Survey, Alaska department of Fish & Game, http://www.adfg.alaska.gov/sf/sportfishingsurvey/index.cfm?ADFG=area.home.

Prior to VFDA supplementing PWS wild coho production with hatchery fish, few returned to the area. While total coho returns totaled less than 10,000 fish before VFDA began releasing coho in the early 1980s, recent returns have regularly exceeded 100,000 fish.

Figure 5.Historical Coho Salmon Returns to PWS Eastern District, 1977-2017



Note: Data presented are best available information. Comprehensive data on coho returns to the Eastern District are not available. Includes sport and commercial harvest, brood stock and other hatchery harvest, and stream escapements
Source: ADF&G.

Charter Fleet Harvest of VFDA Salmon

Charter fishing is an important part of the Valdez visitor industry and VFDA is a key source of fish harvested by the fleet. In 2014 (the most recent data available), 27 charter businesses operated 31 vessels out of Valdez. These vessels made 732 trips with 4,060 anglers. Valdez charter fishing operators generally charge approximately $190-225 per client for a half-day (4-hour) trip, and $250-$400 for a full-day trip. Pricing does not include purchase of a fishing license, tips, or other charges. In addition to salmon, Valdez charter vessels target halibut, ling cod, and rockfish.

Limited and sporadic data prevent a robust understanding of the number of salmon harvested by charter boat vessels. In 2011, ADF&G logbook data show 10,850 coho were landed on charter vessels in Valdez.[6] The most recent data from 2014 show less than 1,000 coho were landed. However, Valdez charter operators report that there can be significant year-to-year variation for coho harvest. Additionally, operators report coho salmon — as a component of their business — has maintained its importance over the years. Some operators indicate the importance of salmon has increased as restrictions limit halibut harvest.

[6] Participation, Effort, and Harvest in the Sport Fish Business/Guide Licensing and Logbook Programs, 2014; Alaska Fish & Game; http://www.adfg.alaska.gov/FedAidPDFs/FDS16-02.pdf

Non-Alaska residents typically are the most valuable customer of the Valdez charter fishing fleet. In 2014, 55 percent of angler days for the fleet were credited to non-Alaska residents.

An estimated $1.8 million was spent annually to fish for salmon (primarily coho) from charter vessels in Valdez. This amount was spent primarily with charter operators, but also includes expenditures on meals, tips, gear, and other supplies. VFDA coho is credited with supporting 80 percent ($1.4 million) of this spending.

Valdez Salmon Derbies

After the VFDA hatchery was opened in 1982 and large numbers of salmon started returning to the waters around Valdez, city leaders saw an opportunity to market Valdez as a destination for world-class sport fishing.

Three salmon derbies are held annually in Valdez: the Silver Salmon Derby, the Kid's Pink Salmon Derby, and Women's Silver Salmon Derby. Anglers compete to catch the largest fish and prizes are awarded for catching the heaviest silver (coho) or pink salmon. Thousands of Alaskans and non-Alaska residents participate annually in these derbies.

The Valdez Silver Salmon Derby has occurred annually since 1952 and typically runs from late July to early September. In 2018, 3,355 tickets and 523 season passes were sold for the derby. Derby tickets are sold for $10 per day or $50 for the season per species. First prize was $10,000, with thousands of dollars in additional daily and other prizes awarded during the tournament.

The all-women, one-day Women's Silver Salmon Derby was added in 2005 and happens annually in August. In 2018, 501 women participated from all over Alaska and the nation—the winner was from Utah.

A Kids' Pink Salmon Derby was launched in 2008. It's a free one-day tournament for children ages 5 through 16. More than 350 kids participated in 2018.

The VFDA hatchery provides most of the salmon caught in these derbies and therefore, accounts for much of the economic activity generated by the derbies.

Shoreside harvest of VFDA Salmon

Many residents and non-residents come to Valdez to fish coho and pink salmon from the shore, including Allison Point and nearby shoreline, from the City Dock, and even at the harbor. The availability of salmon from VFDA helps maintain Valdez as a multi-activity destination for both Alaskans and other travelers. Anecdotal sources indicate these anglers spend money in Valdez with the visitor and hospitality industry, outfitters, and other businesses. Many shoreside anglers traveling to Valdez come each year; some bring motor homes for extended vacations in the area.

Economic Impact

VFDA has a broad economic impact in Alaska and the PWS region, supporting employment and wages in the commercial fishing, processing, and sport fishing sectors. Additional economic activity is supported when employees from these sectors, as well as businesses that supply VFDA, circulate money in the Alaska economy.

Many individuals and businesses are impacted by economic activity generated and supported by VFDA. For example, the mechanic hired to fix a commercial fishing vessel that harvests VFDA salmon is supported indirectly by VFDA. The city worker paid in part by tax revenue generated when VFDA salmon are landed in Valdez owes a portion of her employment to VFDA, and the waiter who serves breakfast to anglers on their way to catch VFDA salmon can be economically connected to the organization.

The economic impact estimates reported below reflect the total amount of employment and labor income related to VFDA — summing up direct impacts as well as indirect and induced jobs and labor income. It is important to note that the total number of workers earning some part of their income from VFDA salmon is far larger than the annualized employment figures shown in this section. Employment figures in this section are presented in fulltime equivalent (FTE) terms.

Commercial Fishing

Between 2012 and 2017, commercial fishermen generated average gross revenues (ex-vessel income) of $19 million per year harvesting VFDA salmon in common property fisheries. Labor income (gross revenues less expenses) for permit holders and crew derived from harvesting VFDA salmon is estimated to be $11.0 million per year. VFDA salmon directly generated the annual equivalent of 165 commercial fishing jobs for permit holders and crew, on average, per year during the six-year study period. Income earned from harvest of VFDA salmon was earned predominantly by Alaska residents living in Prince William Sound, the Kenai Peninsula, or the Anchorage/Mat-Su area.

In addition to this direct employment, an annual average of 75 jobs in the support sector are dependent on VFDA salmon. These jobs accounted for $3.6 million in annual wages.

Combining direct and indirect impacts, the harvest of VFDA salmon supported an annual average of 240 jobs with $14.5 million in wages between 2012 and 2017.

Table 7. Economic Impact on Alaska's Economy from Harvesting VFDA Salmon, Annual Average 2012-2017

	Direct	Indirect and Induced	Total
Employment	165	75	240
Wages ($Million)	$11.0	$3.6	$14.5

Note: Figures have been rounded.
Source: McDowell Group estimates.

Economic Impact from Processing VFDA Salmon

Between 2012 and 2017, regional processors earned estimated average gross margins of $44 million per year from the sale of VFDA salmon. For the purposes of this study, gross margin is equal to sales revenue (payments received for selling processed fish) less the cost of that fish (payments to fishermen for their catch or hatcheries for cost recovery fish).

Over the study period, processing of VFDA salmon helped directly accounted for 200 annual-average jobs with total wages of $7.9 million per year. Additional impacts occur when these wages are spent locally, and as processors purchase goods and services locally. These multiplier effects total an additional 145 jobs and $4.6 million in wages.

Combined, processing of VFDA salmon supported a total of 345 jobs with $12.6 million in annual wages.

Table 8. Economic Impact on Alaska's Economy from Processing VFDA Salmon, Annual Average 2012-2017

	Direct	Indirect and Induced	Total
Employment	200	145	345
Wages ($Million)	$7.9	$4.6	$12.6

Note: Figures have been rounded.
Source: McDowell Group estimates.

Economic Impact from Non-Resident Sport Fishing

Both quantitative and qualitative information show that VFDA supports significant sportfishing activity in Valdez. Of the nearly 100,000 Alaska resident and non-resident visitors to Valdez each year, about one-in-four go sport fishing; many of these anglers end up catching salmon from VFDA.

The total amount of sport fishing-related spending in Valdez is unknown; however, a reasonable estimate would place total spending by non-resident sport anglers at approximately $10 million. This includes spending on charters, lodging, fishing gear, food, fuel and other miscellaneous expenditures. VFDA is conservatively credited with about two-thirds of this spending activity as the organization provides significant amounts of fish harvested by these anglers.

Based on McDowell Group modeling, this spending supports approximately 100 jobs and $4.3 million in labor income annually, including direct, indirect and induced effects.

Table 9. Economic Impact on Alaska's Economy from Sport Harvest of VFDA Salmon, Annual Average 2012-2017

	Direct	Indirect and Induced	Total
Employment	75	25	100
Wages ($Million)	$2.8	$1.5	$4.3

Note: figures have been rounded.
Source: McDowell Group estimates.

Economic Impact of VFDA Business Operations

Significant economic impact is supported by VFDA operations. Each year, the organization employs about 50 people, spends millions of dollars on goods and services in Alaska communities, and periodically invests in large capital projects. Over three-quarters of VFDA's budget is spent within the state of Alaska and the majority of that spending occurs within Valdez and Anchorage.

In a typical year, VFDA employs a core group of about 19 year-round employees. During the summer months, up to 40 additional seasonal workers are hired. Jobs at VFDA include hatchery staff, maintenance workers, administration personnel, and seafood processing workers.

In 2017, VFDA's spending in Alaska totaled about $3.4 million, including about $1.9 million in spending with Alaska organizations and $1.5 million in wages to Alaska residents. VFDA purchases a wide variety of supplies and services from organizations located in Valdez, Anchorage, and other Alaska communities. In a typical year, wages and salaries, medical insurance, fish food, and utilities are among VFDA's largest expenses. Other operating expenses include packaging, fuel, insurance, and maintenance. Alaska resident VFDA employees live primarily in Valdez.

Over the study period, VFDA accounted for an annualized average of 40 jobs with wages of about $1.54 million. Indirect and induced employment associated with VFDA totaled 30 additional workers with wages of $0.93 million — the result of VFDA employees and suppliers of goods and services to the hatchery circulating money in the Alaska economy.

In sum (including direct, indirect, and induced impacts), VFDA operations supported an annual average of 70 jobs with total annual wages of about $2.5 million.

Table 10. Economic Impact on Alaska's Economy VFDA Operations, Annual Average 2012-2017

	Direct	Indirect and Induced	Total
Employment	40	30	70
Wages ($Million)	$1.5	$0.9	$2.5

Note: Figures have been rounded.
Source: McDowell Group estimates.

Summary of VFDA Economic Impacts

Between 2012 and 2017, VFDA hatchery operations supported the annual equivalent of 760 jobs with $33.9 million in annual labor income. VFDA directly supported 490 jobs with $23.3 million in labor income. Additional indirect and induced (multiplier effects) employment of 270 workers and $10.7 million in labor income also resulted from VFDA activities and production. Total economic output, including direct, indirect, and induced effects, averaged $112 million annually.

While the figures represented in these estimates include jobs located around the state, most of these impacts are concentrated in Valdez, Cordova, Anchorage, Homer, and Seward.

Table 11. Summary of Economic Impacts from VFDA, Annual Average 2012-2017

	Direct	Indirect and Induced	Total
Commercial Fishing			
Employment	165	75	240
Labor Income ($Million)	$11.0	$3.6	$14.5
Output ($Million)	$19.3	$12.5	$31.8
Seafood Processing			
Employment	200	145	345
Labor Income ($Million)	$7.9	$4.6	$12.6
Output ($Million)	$39.3	$26.9	$66.2
Sport Fishing			
Employment	75	25	100
Labor Income ($Million)	$2.8	$1.5	$4.3
Output ($Million)	$6.7	$2.3	$9.0
VFDA Operations			
Employment	40	30	70
Labor Income ($Million)	$1.5	$0.9	$2.5
Output ($Million)	$3.4	$1.5	$5.0
Total Impacts			
Employment	490	270	760
Labor Income ($Million)	$23.3	$10.7	$33.9
Output ($Million)	$72.2	$39.9	$112.0

Note: Figures have been rounded.
Source: McDowell Group estimates.

Salmon Market Summary

A primary source of funding for VFDA are cost recovery sales of pink salmon. This market summary focuses on historical trends for Alaska pink salmon values and factors impacting these values for both fishermen and processors. A brief overview of smoked salmon trends is also included.

Trends in Pink Salmon Markets

Myriad issues impact pink salmon markets including key factors described below.

Russian Supply of Pink Salmon

Russia is the world's largest producer of pink salmon with an annual average harvest of 570 million pounds between 2008 and 2012, including 937 million pounds in 2009.[7] Russia government press releases indicate a record-breaking 1.4 billion pounds of salmon have been harvested in 2018 — with pink salmon accounting for much of the volume, in addition to chum salmon. The Unites States (primarily Alaska) is the second largest producer of pink salmon, followed by Canada and Japan.

Because Russia supplies such a large proportion of pink salmon to the world market, a weak or strong harvest in the country can impact values for Alaska and PWS pink salmon.

Growth in World Population and Wealth

World population is expected to grow to 8.6 billion by 2030 and 9.8 billion by 2050.[8] As population and per capita wealth increases, so too will the demand for protein, including salmon.

Asian countries (China in particular) are expected to contribute heavily to future seafood demand. A presentation on the future of aquaculture given by Rabobank (a Dutch financial services company) states (referring to Asia), "The most rapidly expanding middle class in the world also has the highest preference for seafood consumption."[9]

In a scenario of slowly increasing demand for food, Alaska pink salmon is well positioned as an affordable high-quality source of protein.

Aquaculture

Researchers at the World Bank and United Nations have forecasted an expansion of global aquaculture production in the coming decades. The volume of seafood (including all species) produced from the global

[7] NPAFC Catch Statistics: North Pacific Anadromous Fish Commission (NPAFC). 2018. NPAFC Pacific salmonid catch statistics (updated 31 July 2018). North Pacific Anadromous Fish Commission, Accessed 9/26/2018.
[8] https://www.un.org/development/desa/publications/world-population-prospects-the-2017-revision.html
[9] http://2018.intrafishevents.com/sif_may_2016/pres/3_KEYNOTE-RABOBANK.pdf

aquaculture industry is projected to roughly double by 2030. [10] Over the same period, volume from wild capture fisheries is anticipated to increase slightly.

There is evidence these projections may be accurate. The U.S. Department of Commerce's strategic plan includes increased aquaculture production as a strategic objective. Their Strategic Plan for 2018 to 2022 states:

> "Aquaculture is the fastest growing form of food production in the world. Marine aquaculture in the United States contributes to seafood supply, supports commercial fisheries, and has great growth potential. We will help it grow faster by reducing regulatory burden and driving aquaculture research. A strong U.S. marine aquaculture industry will serve a key role in U.S. food security and improve our trade balance with other nations. [11]

Concurrently, interest surrounding land-based farming of salmon is increasing. Atlantic Sapphire, an aquaculture company, is building a facility in Florida with a planned annual production capacity of nearly 200 million pounds of Atlantic salmon.[12] Another land-based salmon-producing facility is in the planning phase.[13] Owned by Nordic Aquafarms, trade press is reporting the facility will have annual production of about 60 million pounds.[14]

Wild-harvest pink salmon are typically priced less on world markets than farmed Atlantic salmon. While most pink salmon are frozen or canned, farmed salmon is often able to serve a fresh market. Although the two species are not often directly competing, significant increases in farmed salmon production (accompanied by a reduction in farmed salmon prices) would likely contribute to lower pink salmon prices. However, pink salmon could benefit from its position as a low-cost alternative, especially for consumers with a preference for wild fish over farmed fish.

Trade Disruptions

Ongoing trade disputes between the U.S. and China (and other countries) have the potential to disrupt established supply chains or markets for Alaska pink salmon.

In 2017, nearly 220 million pounds of Alaska pink salmon worth $290 million was exported to countries around the world.[15] China is the largest trading partner for pink salmon, accounting for about 135 million pounds of exports worth more than $170 million in the same year. Most pink salmon exported from Alaska to China is reprocessed and re-exported.

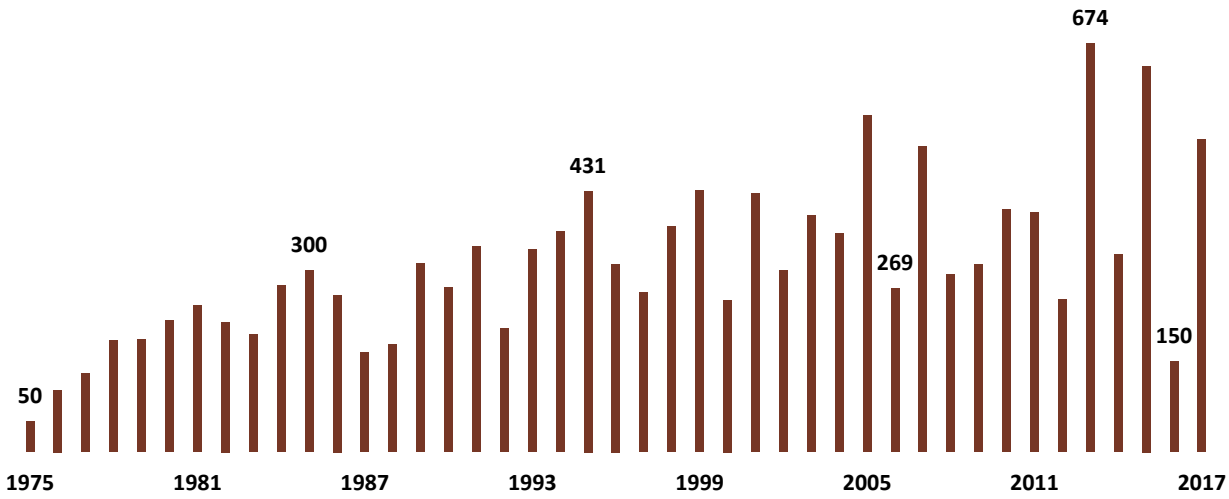
In summer 2018 China enacted additional import tariffs on domestic seafood from the United States, including pink salmon originating in Alaska. However, U.S. product brought into China for purposes of reprocessing and reexport are currently excluded from additional tariffs.

[10] http://www.fao.org/docrep/019/i3640e/i3640e.pdf
[11] https://www.commerce.gov/sites/commerce.gov/files/us_department_of_commerce_2018-2022_strategic_plan.pdf
[12] http://atlanticsapphire.com/about-us
[13] https://www.cityofbelfast.org/DocumentCenter/View/2138
[14] https://www.undercurrentnews.com/2018/02/22/us-aquaculture-industry-still-buzzing-about-nordics-maine-salmon-farm/
[15] McDowell Group estimate based on NMFS trade data.

Historical Alaska Pink Salmon Production

The Alaska pink salmon harvest is increasing, along with its volatility. Between 1975 and 2007, the annual harvest of pink salmon averaged 284 million pounds. This averaged increased to 395 million pounds between 2008 and 2017, including the record-breaking harvest of 674 million pounds in 2013.

Figure 6. Alaska Commercial Pink Salmon Harvest Volume (Million Pounds), 1975-2017



Source: ADF&G.

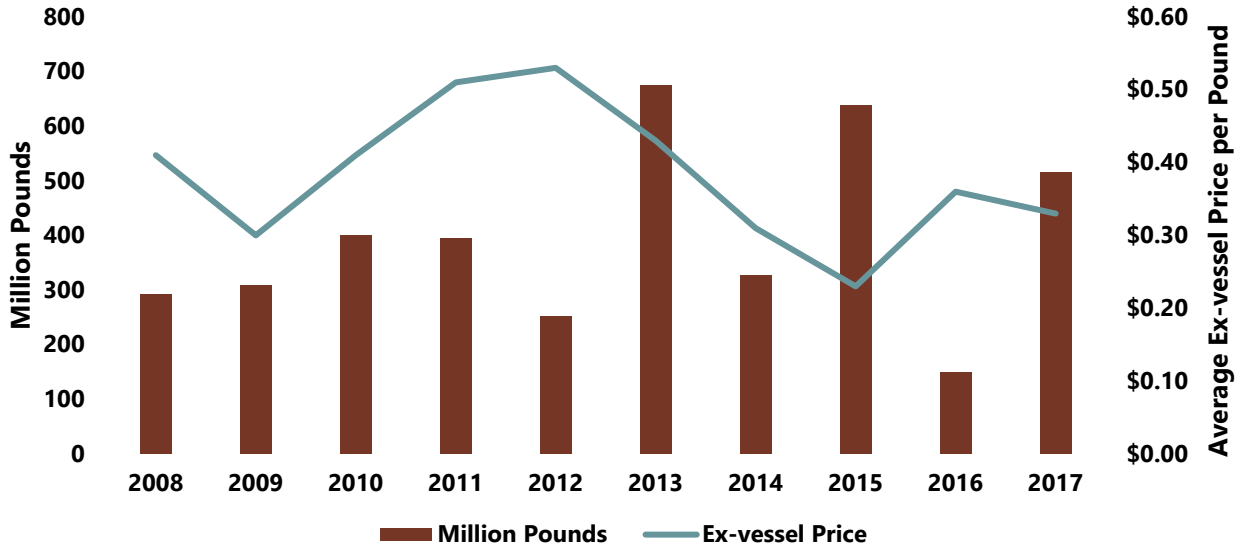
Pink salmon harvests are larger in odd-years because of the species' two-year life cycle. Due to the strength of odd year harvests, the year to year difference has increased compared to historical averages. Between 1977 and 2007, odd year harvests were 27 percent larger than the previous even year. This percentage has expanded to 102 percent over the last decade (2008-2017) due primarily to record setting runs in 2013, 2015, and 2017.

The overall increase in supply of Alaska pink salmon has benefited harvesters and processors alike, but significant variation year-to-year makes planning difficult for both sectors. Harvesters need to be diligent in saving during large years to offset weak years. For processors, it can be difficult balancing capacity for large years with having that capacity sitting unused in low-volume years.

Harvest volume and ex-vessel prices over the last decade were connected, but loosely. In a strict supply and demand model, increased supply would cause prices to decline and vice versa. This was not the case in 2009 and 2010 when prices rose along with volume. However, record harvests in 2013 likely depressed prices in 2014 and possibly 2015.

(*see figure on following page)*

Figure 7. Alaska Commercial Pink Salmon Harvest Volume and Value, 2008-2017



Note: Prices are adjusted for inflation.
Source: ADF&G.

Pink Salmon First Wholesale Product Values

Between 2008 and 2017, the price of all pink salmon products averaged $1.86 per pound in real first wholesale value. A peak of $2.41 per pound was observed in 2012, when a relatively small harvest (and other market factors) supported a high price. The lowest average first wholesale price of $1.37 per pound was observed in 2015 which saw the second-largest pink salmon harvest on record.

The largest annual first wholesale volume and value observed during this ten-year period was in 2013 when Alaska processors produced 446 million pounds of pink salmon products worth $834 million. Production in 2016 was the lowest of this period, measured by value and volume.

Table 12. First Wholesale Volume and Value of Alaska Pink Salmon, 2008-2017

Year	Value ($Million)	Volume (Million Pounds)	Average Price per Pound
2008	$369	174	$2.12
2009	$319	183	$1.75
2010	$519	260	$2.00
2011	$521	261	$1.99
2012	$400	166	$2.41
2013	$834	446	$1.87
2014	$386	229	$1.68
2015	$561	410	$1.37
2016	$179	112	$1.60
2017	$583	329	$1.77

Note: Monetary values are inflation-adjusted.
Source: ADF&G.

Between 2008 and 2017, H&G pink salmon products from Alaska increased in value; roe values fluctuated significantly; and canned values peaked mid-period before returning the 2008-price level.

H&G prices averaged $1.27 per pound, peaking in 2011 ($1.57 per pound), with a low of $1.03 per pound in 2009. Roe prices averaged $7.09 per pound, starting the period with a high of $10.56 and registering a period-low of $3.44 in 2015.

Canned prices peaked in 2012 at $2.62 per pound, averaging $2.16 for the period; the 2015 value of $1.80 per pound marking the low-point.

Table 13. First Wholesale Value of Key Alaska Pink Salmon Products per Pound, 2008-2017

Year	H&G	Roe	Canned
2008	$1.10	$10.56	$2.02
2009	$1.03	$5.12	$2.05
2010	$1.45	$5.41	$2.16
2011	$1.57	$4.73	$2.22
2012	$1.31	$9.86	$2.62
2013	$1.07	$8.44	$2.23
2014	$1.30	$7.83	$2.30
2015	$1.15	$3.44	$1.80
2016	$1.34	$6.62	$2.22
2017	$1.41	$8.91	$2.03
Average	**$1.27**	**$7.09**	**$2.16**

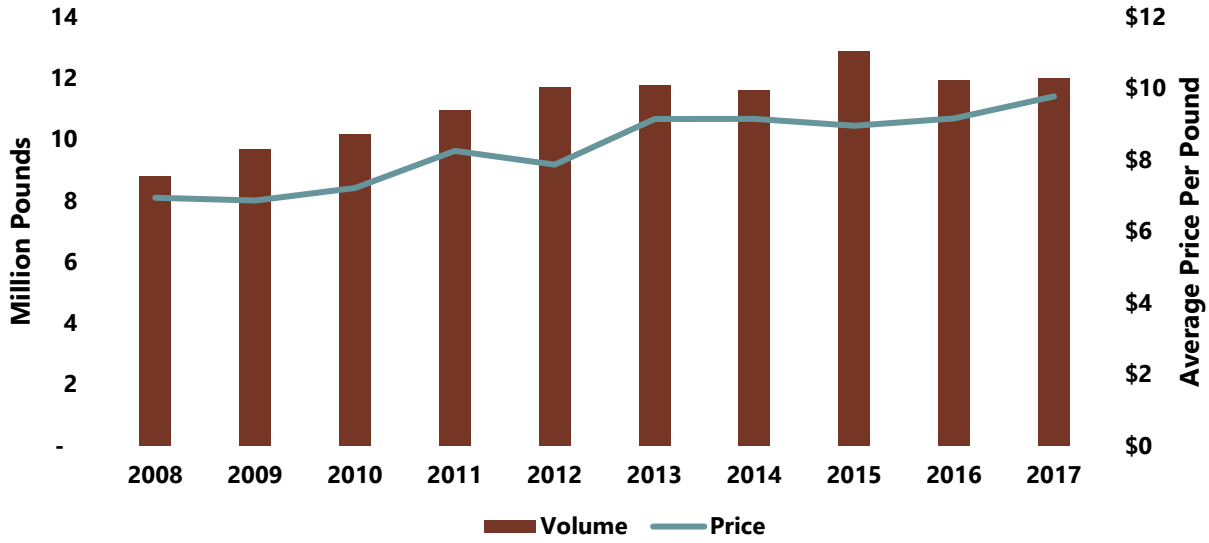
Note: Values are inflation-adjusted.
Source: ADF&G; DOR (Alaska Salmon Price Report).

Smoked Salmon

VFDA has successfully produced and marketed smoked salmon products on a modest scale in recent years. This production is somewhat unique as little salmon is commercially smoked in Alaska. Instead, processors including Ocean Beauty Seafoods and Trident Seafoods smoke salmon in facilities located outside Alaska. Smoked Alaska salmon is also produced by outside companies who purchase salmon from processors.

Minimal data is available on the volume or value of smoked salmon products in the United States. However, the value of imported smoked salmon products offers some perspective on price trends. Since 2008, the average (inflation adjusted) imported value of these products has steadily increased, from about $7.00 per pound to near $10.00 per pound in 2017. This trend suggests demand for smoked salmon has increased in the U.S. – and is likely a positive market factor impacting Alaska smoked salmon.

Figure 8. Import Value and Volume of Smoked Salmon Products, 2008-2017



Note: Price adjusted for inflation.
Source: NMFS.

Appendix

Table 14. VFDA Pink Salmon Egg Take, Juveniles Released, and Total Returns, 1981-2019

Brood Year	Egg Take	Release Year	Juveniles Released	Return Year	Total Returns
1981	9,976,112	1982	7,400,000	1983	95,137
1982	8,410,837	1983	5,600,000	1984	170,633
1983	12,930,976	1984	8,390,000	1985	566,112
1984	66,652,369	1985	51,263,063	1986	1,239,901
1985	96,850,000	1986	54,630,942	1987	5,744,564
1986	64,102,894	1987	59,739,413	1988	1,126,998
1987	161,444,846	1988	130,990,000	1989	3,438,764
1988	152,448,556	1989	128,414,000	1990	11,019,426
1989	142,826,728	1990	122,243,663	1991	6,121,820
1990	159,448,601	1991	131,295,094	1992	2,223,766
1991	202,964,624	1992	86,902,414	1993	1,732,416
1992	208,785,744	1993	141,868,041	1994	13,349,529
1993	231,689,083	1994	149,369,505	1995	6,826,714
1994	219,246,433	1995	205,371,130	1996	7,475,945
1995	239,905,524	1996	223,088,327	1997	7,255,673
1996	208,516,783	1997	188,862,094	1998	4,631,811
1997	237,873,766	1998	195,162,063	1999	14,924,284
1998	231,898,941	1999	213,906,642	2000	12,350,666
1999	238,669,980	2000	195,763,690	2001	16,126,545
2000	235,296,253	2001	203,897,201	2002	5,265,239
2001	227,602,657	2002	202,573,328	2003	17,344,831
2002	236,394,947	2003	206,397,607	2004	11,139,932
2003	236,959,373	2004	222,457,568	2005	18,108,491
2004	233,816,098	2005	222,218,569	2006	9,059,582
2005	239,049,159	2006	216,921,213	2007	23,907,806
2006	235,082,985	2007	220,408,302	2008	14,853,852
2007	233,033,709	2008	199,639,850	2009	1,292,305
2008	237,013,056	2009	226,202,598	2010	18,377,038
2009	236,027,724	2010	223,083,753	2011	13,357,040
2010	236,161,533	2011	222,603,439	2012	10,628,608
2011	236,705,144	2012	214,526,737	2013	22,482,149
2012	232,324,195	2013	218,276,748	2014	25,399,252
2013	231,495,782	2014	219,936,541	2015	34,094,094
2014	231,647,939	2015	223,410,919	2016	8,046,516
2015	236,199,755	2016	226,063,710	2017	14,723,649
2016	251,908,491	2017	241,542,706	2018	n/a
2017	253,331,519	2018	n/a	2019	n/a

Source: VFDA.

Submitted By
Victor Jones
Submitted On
10/2/2018 12:19:02 PM
Affiliation

To Board of Fisheries,

I am opposed to ACR 10, 2, 1. I don't believe any of these ACRs meet the criteria set forth in the BOF Policy and should not have been accepted. All of the ACRs are allocative in nature and would have a detrimental impact on all the fisheries involved. These are long established fisheries with proven track records.

Thank,

Victor E. Jones

Submitted By
Zachary Nelson
Submitted On
10/2/2018 4:30:14 PM
Affiliation

Members of the board of fish, I am strongly opposed to acrs 1&2. The hatchery programs in Alaska are necessary and truly invaluable to the states commercial industry and revenue generating. The claims against it are simply conjecture and have no scientific backing. Thank you.

Zachary Nelson- Alaska Commercial Fisherman